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ORIGINAL ARTICLE

Practical Tips for Surgical Management of Bilateral Choanal Atresia

S. Maheshwaran[1] · S. Pookamala[1] · R. Vijay Pradap[1] · S. Rajavel[1]

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Abstract Choanal atresia refers to congenital blockage of posterior choana of nose by the presence of a bony or membranous soft tissue. It causes respiratory distress in newborn which requires emergency surgical intervention. Various surgical methods are available for correction of choanal atresia and endoscopic approach is the commonly used one. However there is risk of re-stenosis after surgery. This article focuses on surgical refinements to improve the surgical outcome. It is a retrospective study done on eight newborns with bilateral congenital choanalatresia. Data included gestational age, any ante-natal issues, breathing activity at birth, diagnostic tests for choanal atresia and Head to Foot examination findings. Initial diagnostic work up included CT scan of paranasal sinus and Echocardiography to rule out associated cardiac anomalies. All the newborns were treated initially in NICU with ventilator support and then taken up for endoscopic correction of atresia. After surgery, newborns were successfully weaned off from ventilator. Among the 8 newborns, there were 5 males and 3 females and their gestational age was full term. (except in one). Initial presentation included respiratory distress on day 1 of life with difficulty in inserting feeding tube through the nose. Imaging showed bilateral atresia in 7 newborns and unilateral atresia in one newborn. 5 of them underwent atresia surgery using endoscopic approach. One newborn required revision surgery. Remaining newborns remained symptom free during the follow up period. Currently endoscopic approach remains a safer method for correction of choanal atresia with very minimal chance of re-stenosis. Surgical refinements like adequate widening of neo-choana and usage of mucosal flaps to cover the raw area has been found to improve the surgical outcome.

Keywords Choanal atresia · CHARGE syndrome · Endoscopic atresia surgery

Introduction

Choanal atresia refers to congenital blockage of posterior choana of nose by presence of a bony or membranous soft tissue. It can be unilateral or bilateral. Bilateral choanal atresia causes respiratory distress in newborn. It causes cyclical cyanosis, that is babies look better during cry because of mouth breathing and they look cyanosed during rest of the time [1]. Bilateral choanal atresia is associated with various syndromes like CHARGE syndrome, Treacher Collins syndrome, VATER syndrome [2] etc. Diagnosis is confirmed by doing a CT scan of para nasal sinuses, which reveals the presence of atretic plate at the level of posterior choana. Treatment is mainly surgical wherein neo- passage is created in posterior choana under endoscopic guidance. However, neo-choana has a tendency for re-stenosis given the smaller dimension of new born nasal passage. Various surgical refinements are being made to reduce or prevent the chances of re-stenosis. Here we present practical tips to get maximum benefit out of endoscopic surgery on choanal atresia in newborns.

Materials and Methods

It is a retrospective study done on eight newborns with bilateral congenital choanal atresia treated over a period of 5

✉ S. Pookamala
pookamala@yahoo.com

[1] Velammal Medical College, Ring road, Madurai, Tamil Nadu 625009, India

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital and Research Institute
"Velammal Village"
Madurai-Tuticorin
Anuppanadi, Madurai

Cureus

Open Access Original Article

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Comparison of Serum Urea, Salivary Urea, and Creatinine Levels in Pre-Dialysis and Post-Dialysis Patients: A Case-Control Study

Vaishnavi Nagarajan Bhuvaneswari [1], Hariharan Alexander [2], Mamatha T Shenoy [2], Sriramulu D [3], Suganthy Kanakasekaran [2], Mohanty Pradipta Kumar [2], Viveka Murugiah [2]

1. Medicine, Velammal Medical College Hospital and Research Institution, Madurai, IND 2. Biochemistry, Velammal Medical College Hospital and Research Institution, Madurai, IND 3. Nephrology, Velammal Medical College Hospital and Research Institution, Madurai, IND

Corresponding author: Hariharan Alexander, ahariharan.in@gmail.com

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Abstract

Background

Frequent venepuncture for monitoring of serum urea and creatinine in chronic kidney disease (CKD) patients on dialysis will result in venous damage and infection. In this research, we assessed the feasibility of utilizing salivary samples as a substitute for serum samples in determining the levels of urea and creatinine in patients with CKD undergoing dialysis.

Methods

The study participants included 50 patients diagnosed with CKD undergoing hemodialysis and an equal number of apparently healthy individuals. We measured the serum and salivary levels of urea and creatinine in normal subjects. CKD patients were also subjected to similar investigations both before and after hemodialysis.

Results

In our study, we found that the mean value of salivary urea and creatinine are significantly elevated in the case group (salivary urea: 99.56 ± 43.28 mg/dL, salivary creatinine: 1.10 ± 0.83 mg/dL) as compared to the control group (salivary urea: 33.62 ± 23.84 mg/dL, salivary creatinine: 0.15±0.12 mg/dL, p value: <0.001). There was a statistically significant reduction in the mean value of salivary urea and creatinine in the post-dialysis sample (salivary urea: 45.06 ± 30.37 mg/dL, salivary creatinine: 0.43±0.44 mg/dL) compared to the pre-dialysis sample (salivary urea: 99.56 ± 43.28 mg/dL, salivary creatinine: 1.10 ± 0.83 mg/dL; p value: <0.001) in the case group. The salivary urea is significantly positively correlated with serum urea (r value: 0.366, p value: 0.009). But there is no significant correlation seen between salivary and serum creatinine. We have created a cut-off for salivary urea (52.5 mg/dL) to diagnose CKD which has a good sensitivity (84%) and specificity (78%).

Conclusion

The results of our study suggest that the estimation of salivary urea and creatinine could serve as a non-invasive, alternative marker for the diagnosis of CKD, and benefit in risk-free monitoring of their progress before and after hemodialysis.

Categories: Nephrology, Other
Keywords: serum creatinine, serum urea, salivary creatinine, salivary urea, hemodialysis, ckd

Introduction

Chronic kidney disease (CKD) is defined as abnormalities of the kidney structure or function, present for >3 months with health implications [1]. It is prevalent in India, with estimates ranging from 13% to 15.04% [2]. Unfortunately, the incidence of this condition is on the rise and continues to increase annually. Patients with CKD develop several complications like hypertension, electrolyte abnormality, anaemia, alteration in serum calcium and phosphorus concentration due to non-conversion of 25 hydroxycholecalciferol to 1, 25 dihydroxycholecalciferol, acid-base abnormality, reduced excretion of waste products like urea and creatinine which result in multiorgan dysfunction [3-4].

Patients suffering from CKD stage 5 need prolonged renal replacement therapy but the ultimate treatment is a renal transplant. The reduced availability of matching donor organs requires the patient to wait for a long period of time. During this period, the patient undergoes dialysis to prevent complications due to CKD [5]. In dialysis patients, serum urea and creatinine are measured both before and after dialysis to assess the function of the kidney. Since patients with CKD need to undergo frequent dialysis, repeated venous sample

Velammal Medical College Hospital and Research Institute "Velammal Village" Madurai-Melur Main Road Anuppanadi, Madurai-625 009 T.N.

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Profile of Splash, Sharp and Needle-Stick Injuries Among Healthcare Workers in a Tertiary Care Hospital in Southern India

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Praisie R [1], Anandadurai D [1], Sudhir B. Nelson [2], Sriandaal Venkateshvaran [3], Manoje Thulasiram [1]

1. General Medicine, Velammal Medical College and Hospital, Madurai, IND 2. Community Medicine, Velammal Medical College Hospital & Research Institute, Madurai, IND 3. Community Medicine, Velammal Medical College and Hospital, Madurai, IND

Corresponding author: Sriandaal Venkateshvaran, drsriandaalspm@gmail.com

Abstract

Background and objective

Among biological hazards faced by healthcare workers, one of the most commonly reported is sharp-related injury. Needle-stick and sharp injuries transmit infectious diseases, especially blood-borne viruses. The conditions in which these exposures occur vary. Reporting of exposure and proper post-exposure prophylactic measures are important in controlling blood-borne infections in healthcare workers. Better analysis of such accidents is an important tool to reinforce exposure preventive measures. Hence, we conducted a study to describe the profile of splash, sharp and needle-stick injuries among healthcare workers in a tertiary care hospital.

Methods

A record-based cross-sectional study was done in a tertiary care hospital, in south Tamil Nadu. All healthcare workers who have reported needle stick, sharp, or splash injuries during the last five years in the hospital were included. Data was extracted from post-exposure reports maintained in the hospital. Results are expressed in mean, standard deviation and percentages.

Results

A total of 189 healthcare workers (HCWs) had reported instances of splash, sharp and needle stick injuries in the last five years. The most common exposure was needle prick (86.2%), followed by splash of fluids (7.4%). The majority of HCWs were from the nursing department (44.4%), and the most commonly reported place of exposure was the Emergency Department and Intensive Care Unit (ICU) (30.3%), followed by inpatient wards. The associated activity in the majority of the injuries/exposures was the transfer of sharps or cleaning surfaces (26.4%), followed by blood withdrawal (25.7%). After the exposure, 99.5% of HCWs washed the wound immediately. In a total of 135 exposures, the identity of the source, and thus, the serological status was known. Among these, hepatitis B was the most common (17.8%), followed by HIV (11.9%). All exposures related to unknown sources were considered positive exposure and were managed accordingly. Among the HCWs with possible seropositive exposure to hepatitis B, antibody titres were recorded and HBV Immunoglobulin (low titre), and vaccination were administered accordingly. Among the possible HIV exposures, 97.1% of HCWs initiated post-exposure prophylaxis (PEP). All probable hepatitis C exposures were given counseling and advised to follow up. No seroconversion at six months of follow-up has been recorded till now.

Conclusion

Healthcare workers are constantly at risk of exposure to splash, sharp and needle stick injuries, and although all categories of workers are at risk, nurses are at particularly high risk. A variety of activities can result in injury or a splash of fluids and so preventive activities, including health education, should be focused on all areas of healthcare and for all healthcare workers. More awareness is needed among healthcare workers regarding post-exposure prophylaxis.

Categories: Internal Medicine, Infectious Disease, Occupational Health
Keywords: hiv, hepatitis, exposure, needle stick injury, healthcare workers

Introduction

Medicine is a field where there is a high potential for occupational health problems. Its workers work in close contact with patients, who are a potential source of infection. Occupational hazards among healthcare workers include both biological and non-biological hazards. Among biological hazards, one of the most commonly reported is sharp-related injury. The conditions in which these exposures occur vary, and include manipulation of needles, recapping needles, during any procedure/surgery, collision with another

Velammal Medical College Hospital
"Velammal Village"
Madurai-Tuticorin Ring Road

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CORRESPONDENCE

Outbreak of Carbapenem-Resistant *Klebsiella pneumoniae* in a Neonatal Intensive Care Unit

G. Vithiya[1]

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To the Editor: Inadequate disinfection leading to gross environmental contamination has been implicated as the source of many neonatal outbreaks [1, 2]. Our tertiary-level NICU was affected by an outbreak of carbapenem-resistant *K. pneumoniae* (CRKp) with considerable mortality. The primary case of early preterm baby with respiratory distress was admitted on 27.03.2022. Postoperative (emergency laparotomy for necrotizing enterocolitis) blood culture sent on 5.4.22 grew CRKp. The baby died on 19.4.22 due to fulminant sepsis. Three other babies who were admitted on 14.4.22 and 15.4.22 were subsequently infected with the same organism. Two preterm babies with late-onset sepsis survived. A thorough environmental surveillance in the NICU was conducted on 23.4.22 after the third baby was infected. Affected neonates were by then cohorted from the unaffected ones. The duties of the nursing staff were rotational in nature, with habitual exchange between the wards and NICU. The surface cleaning of bed rails and associated items was improperly done with an aldehyde-based disinfectant. Deionized, UV- treated water used in humidifiers grew *Burkholderia cepacia.* Suction bottles were cleaned with plain water without any disinfection. Reuse of a single-use Yankauer suction tube for a prolonged period, which allowed growth of the organism in the rim of tube, was found to be the cause of transmission. After every suction procedure, the tubes were connected back to the suction bottles with a gloved hand, and there is a possibility that the same staff can proceed with suction care for the next baby. The hand hygiene adherence rate among health care workers in the NICU was just 45% during that period. Judicious reuse of single-use semicritical devices and specific interventions, including aldehyde-based surface disinfection at least twice daily, hand hygiene monitoring, and staff education, helped in containing the outbreak. As reported elsewhere, unmonitored reuse of single use semicritical devices contributes to the organism's persistence and transmission [3].

Declarations

Conflict of Interest None.

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✉ G. Vithiya
vidhya.md@gmail.com

[1] Department of Microbiology, Velammal Medical College Hospital and Research Institute, R. S. No. 45/6, Plot no. 20, Babu Nagar Main Road, Sourashtra Teachers' Colony, Madurai, Tamil Nadu 625009, India

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Case Report

Pulmonary tuberculosis and neurologic melioidosis coinfection-first case report from Madurai

G. Vithiya, T. Rajendran, S. Velvizhi, A. Ramesh

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Abstract

Despite tuberculosis and melioidosis being endemic in many countries, coinfections are unusual. Only fourteen cases of tuberculosis melioidosis coinfections have been reported. To the best of our knowledge, this is the first case of coinfection of tuberculosis and neurologic melioidosis. We report a case of 48 year diabetic male presented with fever, headache and altered sensorium for two days. On examination, there was scalp abscess with subgaleal hematoma, pus culture of which grew *B.pseudomallei*. Sputum culture grew the same and sputum tuberculosis PCR was positive. Patient was concurrently treated for both the conditions and recovered.

Introduction

Regardless of tuberculosis and melioidosis being endemic in many countries, coinfections are quite unusual. Only fourteen cases of tuberculosis melioidosis coinfections have been reported of which five cases were from India [1]. To the best of

Velammal Medical College Hospital
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

our knowledge, this is the first case of coinfection of tuberculosis and neurologic melioidosis. Sriwijitalai et al. conducted a clinical epidemiological investigation to assess the chance for concurrent melioidosis and tuberculosis in Thailand endemic for both diseases [2]. Using a mathematical model based on jointed probability principle for estimation for chance of concurrent melioidosis and tuberculosis, the derived value was extremely low, which explains the rare nature of the concurrence.

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Section snippets

Case report

A 48-year-old agricultural worker was admitted with fever, headache and altered sensorium for two days. On admission, blood sugar was 402mg/dl and HbA1c 12.8%, under irregular medications for type 2 diabetes mellitus. He was a smoker and alcoholic for the past 10 years. He attained scalp injury after fall on a stone in his farm two weeks back and local care was given in a nearby facility. On examination, he was febrile (temperature, 102 °F), drowsy and oriented. Arterial blood gas analysis ...

Discussion

Both tuberculosis and melioidosis share similar immune response, risk factors, protean presentations, relapses and need for long term treatment. Though awareness on melioidosis is on the rise, it is far remote compared to tuberculosis in terms of awareness and diagnostic facilities. One primary reason is tuberculosis is notifiable disease in our country whereas voices to include melioidosis under notifiable disease is still feeble [3]. Though there are limitations in detection of extrapulmonary ...

Credit author statement

G. Vithiya: Definition of intellectual content, Literature search, Data acquisition, Data analysis, Statistical analysis, Manuscript review, Guarantor. **T. Rajendran:** Manuscript preparation, Manuscript editing. **S. Velvizhi:** Manuscript review. **A. Ramesh:**

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
"Velammal Village"
Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Traumatic mucormycosis caused by Apophysomyces species - A case series

Vithiya G *, Rajendran T, Ramesh A, Sathesini Priya A

Department of Microbiology, Velammal Medical College Hospital and Research Institute, Madurai, India

ARTICLE INFO

Keywords:
Apophysomyces
Necrotising fasciitis
Trauma

ABSTRACT

Background: Apophysomyces species are emerging as the second most common agent of mucormycosis in India. It is worrisome as it affects predominantly immunocompetent host unlike other Mucorales. Unfortunately, the most common presentation is necrotising fasciitis which can be overlooked as bacterial infection.

Results: Seven cases of mucormycosis due to Apophysomyces species were detected in our hospital between January 2019 and September 2022. Mean age was 55 years and all were males. Six patients presented with necrotising soft tissue infection following accidental or iatrogenic trauma. In four cases, multiple fractures over the body were observed. Median days between admission to laboratory diagnosis was 9 days. All isolates were phenotypically identified as *Apophysomyces variabilis*. Multiple wound debridements, on an average two, was performed in all the cases and amputation performed in two patients. Three patients recovered, two could not be treated due to financial constraints and lost to followup and two patients died.

Conclusion: Through this series, we anticipate to upheave awareness among the orthopedician community about this emerging infection and contemplate it in appropriate case settings. All patients with necrotising soft tissue infection following trauma and significant degree of wound contamination with soil should be suspected for traumatic mucormycosis at the time of wound assessment.

1. Introduction

Apophysomyces species are surging as the second most common agent of mucormycosis in India.[1] It is perturbing as it affects largely immunocompetent host unlike other Mucorales. Regrettably, the most common presentation is necrotising fasciitis which can be overlooked as bacterial infection. So there is a consequential delay in diagnosis when appropriate samples and tests are not sought far. A recent review of literature has identified around 256 cases of mucormycosis reported globally so far due to this emerging fungus.[2] This is definitely an understated condition due to dearth of clinical suspicion and diagnostic delay. Conventional endemic regions include India. This belt has been expanding with recent reports from western countries.[3] Since 2019 we have regularly identified cases of mucormycosis due to Apophysomyces species complex at our center.[4]

2. Case series

Seven cases of mucormycosis due to Apophysomyces species were detected in our hospital between January 2019 and September 2022. Table 1 shows the clinical and epidemiological data of seven patients with mucormycosis caused by Apophysomyces species. Age ranged between 33 and 80 years with a median age of 55 years and all were males implying outdoor activity. There was no seasonal predilection of cases. All isolates caused cutaneous, subcutaneous and soft tissue infection. Six patients presented with necrotising soft tissue infection (cellulitis and fascitis) following accidental(5) or iatrogenic trauma(1). In four cases, multiple fractures over the body were observed. In two other patients, necrotising infection observed in left back and right leg. A young immunocompetent male developed post injection right gluteal abscess. In addition to trauma, comorbidities were noted in some cases. (Diabetes mellitus = 3). An elderly diabetic male patient presented with ulcer over left back for 15 days and reduced level of activity for 2 days without any history of trauma. Median days between admission to laboratory diagnosis was 9 days. Major reason for diagnostic delay was lack of clinical suspicion and appropriate samples (Wound swabs were sent rather than tissue). In most of the cases, fungal infection was not suspected and detected incidentally during routine bacterial culture of wound swabs. KOH mount from the samples showed broad hyaline aseptate fungal hyphae and SDA(Sabouraud's Dextrose agar) tube showed colonies with cotton candy appearance with typical stunted growth at the top unlike other Mucorales which are typically described as lid lifters. LPCB

* Corresponding author. R.S.No 45/6, Plot no.20 Babu Nagar Main Road, Sourashtra Teachers' Colony, Anuppanadi, Madurai, 625009, India.
E-mail address: vidhya.md@gmail.com (V. G).

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Brief Communication

Burkholderia cepacia infections at sites other than the respiratory tract: A large case series from a tertiary hospital in Madurai

G. Vithiya [a], S. Raja [b]

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Abstract

Sparsely reported extrapulmonary *Burkholderia cepacia* complex (Bcc) infections highlights the importance of this study. This was a retrospective chart review of 37 patients with extrapulmonary Bcc infections admitted between December 2019 and July 2022 in a tertiary hospital. Males accounted for 70% of cases. 78% had atleast one underlying comorbid illness. Among 37 isolates, 22 were from blood, others include exudates, urine and peritoneal fluid. Susceptibility rates of ceftazidime, meropenem, minocycline, cotrimoxazole and levofloxacin were 88, 88, 70, 65.7 and 56.7% respectively. Eleven died of septic shock and 24 patients (64.8%) had good outcomes, while two were lost to followup.

Introduction

Burkholderia cepacia is a well known respiratory pathogen in patients with cystic

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625

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Major Article

Comparison of hand hygiene compliance among healthcare workers in Intensive care units and wards of COVID-19: A large scale multicentric study in India

Sarumathi Dhandapani MD, DNB [a], Deepashree Rajshekar MD, DNB [b], Ketan Priyadarshi MD, DNB [c], Sivanantham Krishnamoorthi MD [d], Raja Sundaramurthy MD [e], Haritha Madigubba MD [f], Apurba Sankar Sastry MD, DNB, MNAMS, PDCR [g,*], Contributors of HHAC study group

[a] Dept. of Microbiology, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry, Tamil Nadu, India
[b] Hospital Infection Control, Department of Microbiology, JSS Medical College, Mysore, Karnataka, India
[c] Dept. of Microbiology, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) Pondicherry, Tamil Nadu, India
[d] Department of Microbiology, All India Institute of Medical Sciences, Bathinda, Punjab, India
[e] Department of Microbiology, All India Institute of Medical Sciences, Bibinagar, Telangana, India
[f] Yashoda Hospital, Malakpet, Hyderabad, India
[g] Department of Microbiology, JIPMER, Pondicherry, Tamil Nadu, India

Key Words:
COVID care location
Hand Hygiene audit
Hand hygiene adherence rate
Standard precautions
COVID ICUs
COVID wards

A B S T R A C T

Background: Hand hygiene is a significant component involved in preventing transmission of health care associated infections including COVID-19. Compliance to hand hygiene among the health care workers (HCWs) requires evaluation and timely feedback. "You can't improve what you can't measure" is a famous saying and this multicentric study was designed to measure hand hygiene compliance and have birds eye view on hand hygiene compliance in COVID Intensive care units (ICUs) and wards across India.

Methods: A prospective multicentric observational study was conducted for a period of 6 months in 92 health care facility across India which included varied type of public and private hospitals. Hand hygiene audit was conducted in COVID ICU and COVID non-ICU wards in all these facilities by their HCWs using the IBHAR mobile application based on WHO's hand hygiene audit tool. Hand hygiene total adherence rate (HHTAR) and hand hygiene complete adherence rate (HHCAR) were analyzed and compared between 2 locations. Adherence rates were analyzed based on the zones, institute type, profession and for each WHO moments.

Results: A total of 1,61,056 hand hygiene opportunities were documented and adherence rates were recorded higher in COVID wards (HHTAR-61.4%; HHCAR-28.8%) than COVID ICUs (HHTAR-57.8%; HHCAR-25.6%). Overall, the adherence rates were observed higher in COVID wards (HHTAR- 68.1%; HHCAR-38.3%) of private hospitals, COVID wards of the west zone (HHTAR- 70.2%; HHCAR-36.8%), cleaning staffs of the COVID ward scores better compliance than all other professions in COVID ICUs and COVID wards. HHTAR was found to be the higher in moment 3 (After body fluid exposure-76.3%) followed by moment 4 (after touching patient-73.7%) done in COVID wards compared to moments done in ICUs.

Conclusions: This study highlights the practice of hand hygiene in COVID care locations across India. Effective strategies need to be implemented in COVID ICUs across the facilities to improve the compliance.

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INTRODUCTION

Hand hygiene is considered as one of the significant components of hospital infection control. By improving hand hygiene adherence, health care associated infections can be significantly reduced.[1,2]

* Address correspondence to Apurba Sankar Sastry, MD, DNB, MNAMS, PDCR, Department of Microbiology, JIPMER, Pondicherry, TN, India.
E-mail address: hhacstudy@gmail.com (A.S. Sastry).
HHAC Study Group (contributor list including main authors)

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625

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Case Report

Case series of aspergillus spondylodiscitis from a tertiary care centre in India

G. Vithiya [a], S. Raja [c], M. Mariappan [b], T. Rajendran [a]

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Abstract

Aspergillus spondylodiscitis is a rare entity reported in the literature. In tuberculosis endemic regions like India, more often it could be misdiagnosed as tuberculous spondylodiscitis. Herein we report a case series of three patients with Aspergillus spondylodiscitis presenting with chronic low backpain and clinically diagnosed as tuberculosis spine. Culture and histopathological examination of the debrided tissue provided a definite diagnosis. Interestingly, one of the cases had coexisting tuberculosis spine. All three patients underwent surgical intervention-debridement, decompression and fusion of spine and combined medical management with voriconazole with successful outcome.

Introduction

Fungal infections of spine are rarely reported in literature, not more than 200 cases [1]. Ours is a tertiary care teaching hospital with dedicated spine clinics. In four years, we have encountered three cases of Aspergillus spondylodiscitis. It is most likely that many cases may go undetected or misdiagnosed as tuberculosis due to shared risk

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Surgical Scar Endometriosis: An Emerging Enigma

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Anitha Durairaj [1], Harini Sivamani [1], Mahalakshmi Panneerselvam [1]

1. Obstetrics and Gynaecology, Velammal Medical College Hospital and Research Institute, Madurai, IND

Corresponding author: Anitha Durairaj, dranithasrinidhi@gmail.com

Abstract

Introduction

Surgical scar endometriosis is a subtype of extra-pelvic endometriosis that is characterized by the formation of endometrial tissue near the incision site in patients who have previously undergone surgery. In recent times, with the increasing trend in Caesarean sections, the incidence of surgical scar endometriosis has also emerged. This study aims to describe the clinical characteristics and management of surgical scar endometriosis.

Methodology

We conducted this cross-sectional, observational study over eight years (2015-2022) in a tertiary care centre in Madurai district, Tamil Nadu, India. We conducted this study after acquiring an ethical certificate from the institutional ethics committee (IEC No. VMCIEC/22/2018). In this study, we sampled all women (n = 32) with a pathological diagnosis of scar endometriosis during the study period from hospital records (universal sampling). We searched the data for both general characteristics and lesion characteristics of the patients. The general characteristics include age, body mass index (BMI), parity, mode of delivery, symptoms, and imaging by ultrasound. We have recorded the lesion characteristics of the patient, including location and size of scar endometriosis, layers involved in scar endometriosis, and surgical technique from surgical notes written in the case sheet. The minimum sample size required for this study was 31 study subjects. We entered the data into Excel (Microsoft, Redmond, WA, USA) and analyzed it in SPSS version 21 (IBM Corp., Armonk, NY, USA). We expressed the quantitative variables in terms of mean and standard deviation and the qualitative variables in terms of frequency and percentage.

Results

The mean age of the study participants was 34 years (range 23-55 years). In our study, 29 patients (90.6%) were multi-para, and only three (9.4%) were nullipara. Among 29 parous women, the majority (25, or 77.7%) had delivered by Caesarean section, while only four (12.5%) delivered by normal vaginal delivery. The surgical procedures preceding the scar endometriosis were predominantly obstetric procedures (87.4%), out of which 25 patients underwent a Caesarean section and only three underwent an episiotomy. The most common presenting symptom of scar endometriosis in our study was cyclical pain in the scar site (90.4%), followed by swelling (81.25%). In 62.5% of patients, the duration between the presentation of surgical scar endometriosis and surgical intervention was greater than one year. Subcutaneous tissue (90.6%) was the most commonly involved layer in surgical scar endometriosis, followed by the rectus sheath (86.2%). The surgical procedure done for scar endometriosis was wide local excision in 78% of patients, and the remaining 22% of patients had wide local excision with mesh repair.

Conclusion

Cesarean section is an obvious risk factor for surgical scar endometriosis. Clinicians should have a high index of suspicion for surgical scar endometriosis in women presenting with cyclic pain at the scar site. Ultrasound is accurate in diagnosing scar endometriosis. Surgical management by wide local excision with a clear margin with or without mesh repair is the treatment of choice.

Categories: Medical Education, Obstetrics/Gynecology, General Surgery
Keywords: cross-sectional study, lesion characteristics, demographic characteristics, surgical management, surgical scar endometriosis, cesarean section

Introduction

Endometriosis is a benign gynecological disorder characterized by the growth of endometrial glands and stroma outside the uterine cavity. Endometriosis is an estrogen-dependent chronic inflammatory disease that can affect either the pelvic or extra-pelvic regions of a woman's body. We classify it as either pelvic or extra-pelvic endometriosis [1].

Prof. T. THIYAGARAJAN, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Anuppanadi, Madurai-625 009. T.N.

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A Novel Combined Anesthetic Technique to Improve the Surgical Working Conditions of Lumbar and Thoracolumbar Spine Surgery from a Spine Surgeon's Perspective: A Prospective Randomized Controlled Study

Meenakshisundaram Subbiah[1], Kondusamy Manohar Madhuvarshinee[1], Rabindran John Santha Vinothan[2], Vijayakumar Poornima[2], Ragupathy Ramanarayanan[2], Bose Manikandan[2], Palaniappan Suresh[2], Vijay Anto James[3], Krishnan Yegumuthu[4]

[1]*Department of Orthopaedics & Spine Surgery, Velammal Medical College Hospital and Research Institute, Madurai, India*
[2]*Department of Anaesthesia, Velammal Medical College Hospital and Research Institute, Madurai, India*
[3]*Velammal Medical College Hospital and Research Institute, Madurai, India*
[4]*Department of Pathology, Velammal Medical College Hospital and Research Institute, Madurai, India*

Study Design: Prospective randomized controlled study.

Purpose: This study aimed to assess the effects of a different combination of anesthetic techniques in lumbar and thoracolumbar spinal surgeries in terms of muscle relaxation and surgical field in addition to hemodynamic parameters.

Overview of Literature: Adequate relaxation of the erector spinae muscle and good surgical fields are preferred in lumbar spine surgeries. The effects of anesthetic techniques on these parameters have not been evaluated from a surgeon's perspective to date. We propose a novel combined anesthetic technique that improves the working conditions from a surgeon's perspective as we hypothesize that combining general anesthesia (GA) with regional anesthesia (RA) might provide benefits for both techniques.

Methods: A prospective randomized study of 76 patients who underwent lumbar and thoracolumbar surgeries was conducted by randomly allocating patients into three anesthetic groups: GA alone, GA with spinal anesthesia (SA), and GA with erector spinae plane block (ESPB) by the allocation concealment method to avoid selection bias. The working conditions were assessed by the same operating surgeon who was blinded by the type of anesthesia to eliminate the assessment bias. Muscle relaxation and surgical field were compared among the three groups along with other hemodynamic parameters to identify any significant differences.

Results: Significantly better muscle relaxation, surgeon satisfaction, postoperative analgesia, and blood pressure (BP) were observed in the GA+RA when compared to GA alone ($p<0.01$), whereas no difference was observed between the GA+SA and GA+ESPB groups ($p>0.05$). Complications were only observed in the GA+SA group (19%).

Conclusions: The study results suggest that the addition of RA to GA may provide better working conditions and surgeon's satisfaction by improving relaxation of the erector spinae in addition to decreasing the BP and postoperative pain in contrast to the use of GA alone. The combined GA and ESPB techniques may be a viable anesthetic alternative to provide better working conditions for surgeons.

Keywords: Lumbar vertebrae; Muscle relaxation; Nerve block; Paraspinal muscles; Spine

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Corresponding author: Meenakshisundaram Subbiah
Department of Orthopaedics & Spine Surgery, Velammal Medical College Hospital and Research Institute, Velammal Village, Madurai-Tuticorin Ring Road, Anuppanadi, Madurai, Tamil Nadu 625009, India
Tel: +91-452-7113333, Fax: +91-4522510010, E-mail: ortho@velammalmedicalcollege.edu.in

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Prof. M. Manohar Madhuvarshinee M.S., D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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The Effectiveness of Adjuvant Attangaogam (Athanam) Yoga Asana-Pranayamam Practices With Regard to Biochemical, Inflammatory, and Hematological Markers Among COVID-19 Patients at a Tertiary Care Hospital in Southern Tamilnadu

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Suganthy K [1], Lakshmiprabha S [2], Virgin Joena M [3], Vishnu shankar Raja MR [4], Raj Kishore Mahato [5], Hariharan A [1], Mamatha T Shenoy [1], Shanmugapriya V [2], Pradipta Kumar Mohanty [1]

1. Biochemistry, Velammal Medical College Hospital and Research Institute, Madurai, IND 2. Biochemistry, Vinayaka Missions Medical College & Hospitals, Karaikal, IND 3. Medicine, Velammal Medical College Hospital and Research Institute, Madurai, IND 4. Yoga and Naturopathy, Attangaoga Peedam, Tirunelveli, IND 5. Pharmacology, Velammal Medical College Hospital and Research Institute, Madurai, IND

Corresponding author: Suganthy K, drksuganthy@gmail.com

Abstract

Background and objective

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a highly contagious infectious disease that has affected many countries globally. Attangaogam, known in Sanskrit as "Ashtanga yoga", is a practice associated with the spiritual and cultural heritage of India whose origins can be traced back to the very dawn of civilization; the practice of yoga promotes health, healing, and longevity. This study aimed to analyze the effects of Attangaogam (Athanam) yoga asana-Pranayamam practice on biochemical, inflammatory, and hematological markers in the management of COVID-19.

Materials and methods

A prospective observational study was conducted from August 2021 to February 2022 among hospitalized adult patients of both sexes who consented to participate and tested positive for COVID-19 reverse transcription-polymerase chain reaction (RT-PCR). Convenience sampling was employed and the study was approved by Institutional Ethics Committee (VMCIEC/74/2021). Clinical details, inflammatory markers, D-dimer, lactate dehydrogenase (LDH), ferritin, procalcitonin (PCT), interleukin 6 (IL-6), and complete blood count (CBC) were analyzed for all the volunteering patients on admission and before commencing yoga-pranayamam practices. Also, the parameters were recorded after practicing the scheduled protocol: on the day of discharge, and after the first and third months of discharge. Microsoft Excel 2013 was used for statistical analysis.

Results

Of the 76 patients, 32 were followed up regularly; the mean age of the cohort was 50.6 ± 4.95 years, and 62% were males. All the patients attained normal oxygen saturation and got discharged in 7-14 days. The comparison of clinical, hematological, inflammatory, and biochemical investigations between pre- and post-Attangaogam yoga-Pranayamam practice sessions showed statistically significant differences and the patients attained normal levels for all variables within three months except for serum albumin.

Conclusion

Based on our findings, the practice of Attangaogam yoga-Pranayamam contributed to the successful treatment of COVID-19 with the early restoration of protracted hypermetabolic and hyperinflammatory markers to normal status. The evidence related to biomarkers revealed that the patients attained metabolic normalcy of cell health with the aid of personalized physical rehabilitation counteracting inflammation and promoting tissue repair thanks to holistic natural and innate immunity provided by Attangaogam yoga-pranayamam practices.

Categories: Pulmonology, Environmental Health, Epidemiology/Public Health
Keywords: covid-19, attangaogam, yoga, pranayamam, biochemical markers, inflammatory markers

Introduction

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"

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Ultrasound-Guided Subclavian Vein Catheterization: Contrasting Supraclavicular and Infraclavicular Approaches for Enhanced Procedural Precision

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Rama Devi [1]

1. Anaesthesiology, Velammal Medical College and Research Institute, Madurai, IND

Corresponding author: Rama Devi, rama_rathi86@yahoo.co.in

Abstract

Background

Ultrasound-guided subclavian vein catheterization is crucial for central venous access, but the choice between the supraclavicular and infraclavicular approaches lacks comprehensive comparison. This study addresses this gap by conducting a prospective observational analysis of both techniques. The supraclavicular method accesses the vein from above the clavicle while the infraclavicular targets it below. Our model-driven approach aims to elucidate the procedural nuances, success rates, and complications associated with each method. The findings intend to equip clinicians with evidence-based insights, facilitating informed decision-making for improved procedural outcomes in ultrasound-guided subclavian vein catheterization.

Aim and objective

This study aims to comprehensively compare the supraclavicular and infraclavicular approaches in ultrasound-guided subclavian vein catheterization, evaluating the procedural minutiae, potential advantages, and challenges associated with each technique. Employing a prospective observational methodology, our objective is to provide evidence-based insights for approaches in ultrasound-guided subclavian vein catheterization, evaluating procedural nuances, success rates, and complications during the procedure.

Methods

In this prospective investigation, 276 patients aged between 20 and 55 years were randomly assigned to two groups: 143 patients in the supraclavicular group and 133 patients in the infraclavicular group. Specifically, patients admitted for elective surgery necessitating postoperative ICU care were considered. The study assessed various variables, including success rate, time required for venous visualization, venous puncture, catheterization, total procedure duration, and incidence of mechanical complications, to facilitate group comparisons.

Results

The mean procedural time was shorter in the supraclavicular group compared to the infraclavicular group, with durations of 2 minutes and 2 seconds versus 3 minutes and 40 seconds, respectively (95% CI). This difference was statistically significant. Similarly, the mean durations for venous visualization, venous puncture, and venous catheterization were also shorter in the supraclavicular group, and these differences were statistically significant. Both groups achieved a 100% success rate, with the first attempt success rate being higher in the supraclavicular subclavian vein group.

Conclusion

The findings of this study demonstrate a statistically significant advantage in favor of the supraclavicular approach for ultrasound-guided subclavian vein catheterization. The shorter mean procedural time, as well as durations for venous visualization, puncture, and catheterization, emphasize the efficiency of the supraclavicular technique. The consistently achieved 100% success rate, coupled with a higher first-attempt success rate, further underscores the proficiency of the supraclavicular subclavian vein group. These results collectively suggest that the supraclavicular approach is not only time-efficient but also superior in terms of successful central line placement, making it a promising choice for both emergency and critical care settings.

Categories: Internal Medicine, Anesthesiology, Emergency Medicine
Keywords: central venous access, infraclavicular, supraclavicular, catheterization, subclavian vein, ultrasound-guided

Introduction

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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The Association of Sperm DNA Fragmentation With Serum Lipid Profile Among Males With Abnormal Semen Parameters: An Analytical Cross-Sectional Study

Raju Kumaran Thankamoni [1], Dharmaraj W. Tamgire [2], Papa Dasari [3], Prashant S. Adole [4], Sreerekha Jinkala [5], Kubera NS [3], Viveka Murugiah [6]

1. Anatomy, Velammal Medical College Hospital and Research Institute, Madurai, IND 2. Anatomy, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, IND 3. Obstetrics and Gynaecology, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, IND 4. Biochemistry, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, IND 5. Pathology, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, IND 6. Biochemistry, Velammal Medical College Hospital and Research Institute, Madurai, IND

Corresponding author: Dharmaraj W. Tamgire, drdharmarajtamgire@gmail.com

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Abstract

Background: Through the ages, infertility, affecting 8% to 12% of couples worldwide, has been a perturbing clinical problem. Approximately 40% to 50% of all infertility cases are due to 'male factor' infertility. Semen analysis is crucial in routinely evaluating idiopathic male infertility. Studies support the idea that semen parameters are associated with serum lipids and sperm DNA fragmentation (SDF). Therefore, it is possible to evaluate male infertility by serum lipid levels, especially before assisted reproduction technology, and modify it by bringing about lifestyle modifications. This study aimed to measure the correlation of SDF with levels of total cholesterol (TC), triglycerides (TG), very low-density lipoprotein (VLDL), low-density lipoprotein (LDL), and high-density lipoprotein (HDL) among males with abnormal semen parameters.

Methods: A cross-sectional analytical study was conducted in the infertility clinic of a tertiary care hospital. A total of 106 infertile males with abnormal semen analysis as per the WHO criteria (2010) were enrolled in the study. After routine semen analysis, SDF was studied using the comet assay. The serum fasting lipid profile was analyzed using the spectrophotometric kit in the autoanalyzer. The relationship of SDF with serum lipid profile parameters was analyzed.

Results: Out of 106 infertile men, 52% (n = 55) had severe SDF. A modest positive correlation was observed between SDF (percentage of DNA in comet tail) and serum lipid values (serum TG, serum LDL, and serum VLDL).

Conclusions: Our study is novel in its research on the correlation between SDF and serum lipid values. Based on the findings of our study, it can be concluded that a significant level of SDF was observed in men with high levels of serum TG, LDL, and VLDL. This provokes a potential relationship between sperm DNA integrity and serum lipid profile, which warrants further research.

Categories: Anatomy, Obstetrics/Gynecology, Urology
Keywords: serum lipid profile, infertility, semen analysis, comet assay, sperm dna fragmentation

Introduction

Infertility is a disease of the reproductive system that is defined as the inability of a non-contracepting, sexually active couple to achieve pregnancy in one year [1]. The social stigma associated with it causes severe trauma for an individual. In recent years, there has been a surge in infertility in most parts of the world, affecting 8% to 12% of couples, of which the sole cause in approximately 40% to 50% of cases belongs to the male [2].

A decline in semen quality and sperm parameters has been observed in South India over the past 13 years [3]. A routine semen analysis assessing a decrease in semen quality and quantity does not always give a definite diagnosis; i.e., in 15% of male factor infertility cases, the results are normal [4]. Additionally, with intracytoplasmic sperm injection (ICSI), conventional sperm analysis has fallen out of favor. More attention is being given to sperm molecular architecture, as mammalian fertilization and subsequent embryo development depend in part on the inherent integrity of sperm DNA [5].

Studies have noted diverse observations exploring the link between sperm DNA fragmentation (SDF) and infertility due to male factors. Several types of lipids, different in structure and function, are present in the

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai Tuticorin Ring Road
Panguneri, Madurai-625 009, T.N.

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Tacrolimus Concentration/Dose Ratio: A Tool for Guiding Tacrolimus Dosage Post-renal Transplantation

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Mamatha T Shenoy [1], Jeyakumar Manavalan [2], Hariharan A [1], Suganthy K [1], Pradipta Kumar Mohanty [1]

1. Biochemistry, Velammal Medical College Hospital and Research Institute, Madurai, IND 2. Biochemistry, Sri Manakulavinayagar Medical College and Hospital, Puducherry, IND

Corresponding author: Jeyakumar Manavalan, drjaidyogi@gmail.com

Abstract

Background

The calcineurin inhibitor, Tacrolimus (Tac), exhibits variable absorption and undergoes first-pass metabolism when administered orally. The narrow therapeutic window and individual variability of this immunosuppressive agent make therapeutic drug monitoring essential. We hypothesized that the Tac metabolism rate - defined as the blood concentration normalized by its daily dose (the C/D ratio) - is associated with post-renal transplant (RTx) function.

Methodology

A retrospective observational study was conducted including 40 RTx patients. Clinical reports from four follow-up ambulatory appointments at one, three, six, and 12 months were analyzed. Tac dose and its blood levels were used to calculate the Tac concentration/dose (C/D) ratio. Patients with a Tac C/D ratio <1.05 ng/mL x 1/mg and a C/D ratio >1.05 ng/mL x 1/mg were categorized as fast and slow metabolizers. Serum creatinine levels were compared between the two groups, and their association with the Tac C/D ratio was analyzed. Student's unpaired t-test and the Mann-Whitney U test were used to analyze the difference in the C/D ratio between the groups. Spearman correlation analysis was conducted to analyze the association of the C/D ratio with serum creatinine in both groups. A *P*-value of <0.05 was considered statistically significant.

Results

Fast metabolizers showed increased serum creatinine ($P < 0.05$), and the C/D ratio correlated with creatinine levels. ROC analysis used to identify fast metabolizers for the C/D ratio at three months had an area of 0.925 ($P < 0.01$).

Conclusions

The Tac C/D ratio can be used as an earlier diagnostic tool to predict the development of nephrotoxicity in RTx patients.

Categories: Nephrology, Transplantation, Therapeutics
Keywords: concentration/ dose ratio, cyp3a5 genotype, nephrotoxicity, post-renal transplant, tacrolimus

Introduction

Tacrolimus (Tac) is one of the most effective immunosuppressive drugs used in post-renal transplant (RTx) to prevent organ rejection. It is used in combination with mycophenolate mofetil and prednisolone [1]. Because of its lipophilic nature, absorption of oral Tac varies between individuals, which can influence its efficacy and toxicity [2]. The narrow pharmaceutical window and high inter-individual variation of Tac greatly influence the pharmacokinetics of the drug, and it necessitates the frequent monitoring of blood Tac levels and dose adjustments when needed [3]. It is essential to maintain the optimal levels of Tac to prevent acute or chronic graft rejection. Lower Tac trough level was found to be associated with acute graft rejection within one year of renal transplant [4]. On the other hand, high trough levels of Tac were associated with delayed graft rejection, nephrotoxicity, neurotoxicity, and diabetogenic effects [5]. Calcineurin inhibitor (CNI)-related nephrotoxicity (CNIT) can be either acute or chronic. Moreover, nephrotoxicity occurs not only with higher troughs of Tacrolimus but also with lower trough concentrations. It is very crucial to identify the patients at risk for developing such nephrotoxicity at the earliest. Although nephrotoxicity is attributed to the Tac concentration [6], its metabolism also plays a major role in it. Apart from its absorption, various factors like albumin levels in the blood, old age, and male gender influence the metabolism of Tac [7]. Also, the drug interaction of Tac with other immunosuppressive agents makes an impact while optimizing the daily dosage of Tac [8]. The inter-individual variation of Tac can be attributed to polymorphisms in the gene encoding the cytochrome P450 (CYP) enzymes CYP3A4 and CYP3A5

Prof. Dr. R. MUTHUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai - 625 009, T.N.

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Quick Response Code:

Short Paper

Isolated bovine pancreatic islets as an alternate *in vitro* model for diabetes research

Neetu Prince[1], Jagadish Ramasamy[2], Soosai Manickam Amirtham[1], Elanchezhian Rajendran[1] & Puurnima Mani[1]

[1]*Department of Physiology, Christian Medical College, Vellore &* [2]*Department of Biochemistry, Velammal Medical College Hospital and Research Institute, Madurai, India*

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***Background & objectives*: Isolation of functional pancreatic islets for diabetes research and clinical islet transplantation stands as a big challenge despite the advancements in the field. In this context, the non-availability of human/animal tissues is one of the major impediments to islet-based research, which has tremendous scope for translation. The current study explores the feasibility of using the bovine pancreas as an alternative source to isolate pancreatic islets and assess its functionality for *in vitro* studies.**

***Methods*: The bovine pancreas was collected from a registered slaughterhouse and transported in an ice-cold medium – Hank's Balanced Salt Solution (HBSS) to the laboratory. Islets were isolated by sequential collagenase digestion followed by a two-step filtration and purification by density gradient separation method. After isolation, islets were identified with dithizone staining and the islet function was assayed *in vitro* for assessing the dynamic insulin secretory function by monitoring the glucose-stimulated insulin secretion (GSIS), in response to low and high glucose. Staining techniques were also used to understand the cytoarchitecture of the bovine pancreas.**

***Results*: The islet yield was 157±23 islets per gram of pancreas and was viable. The cold ischaemia time was reduced to 60-75 min. The islets released insulin with glucose stimulation. The insulin release was observed more with high glucose (28 mM) than with low glucose (2.8 mM). Dithizone staining confirmed the presence of islets after isolation and the size of islets ranged from 50 to 600 µm size. The mantled islets (islets with acinar tissue) were also noted with the pure islets in culture. Hematoxylin and eosin (H&E) and aldehyde- fuchsin showed islets interspersed in the acinar tissue of the bovine pancreas. Special stain defined the islets better than regular staining. Fluorescent and diaminobenzidine (DAB) staining with insulin, glucagon and somatostatin revealed the arrangement of the cells in each islet. The beta cells were majorly found in the islet core with alpha cells interspersed with the delta cells in the periphery.**

***Interpretation & conclusions*: The isolation procedure described in this study yielded viable islets for *in vitro* studies which showed a differential response to glucose challenge, confirming their viability. We provide a simple and reproducible method for small-scale isolation of functional islets from the bovine pancreas. This model proffers the beginner a hands-on in islet experiments and helps to re-iterate the process that could be extrapolated to other pancreatic tissues as well as to expand on diabetes research.**

Key words Bovine pancreas - collagenase - insulin - islets - transplantation

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Prof. T. THINONAYAKKANAR, M.D., D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

Research Article

Diagnostic Utility of Pan-Immune-Inflammation Value (PIV) in Predicting Insulin Resistance: Results from the National Health and Nutrition Examination Survey (NHANES) 2017–2020

Jagadish Ramasamy[1*], Viveka Murugiah[1], Aarathy Dhanapalan[1], Geerthana Balasubramaniam[1]

[1*]*Department of Biochemistry, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India*

Article Info

Author of correspondence:
Dr. Jagadish Ramasamy MD DNB, Associate Professor;
Department of Biochemistry;
E-mail: iamjagankmr@gmail.com;
Tel.: +91 8015597917
ORCID: 0000-0003-4725-3227
Address:
Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India 625009

Keywords

PIV, pan-immune-inflammation value, insulin resistance, inflammation, diabetes, metabolic syndrome.

Abstract

Background

Insulin resistance (IR), a hallmark feature of diabetes and metabolic syndrome, is characterized by chronic low-grade inflammation. Pan-immune-inflammation value (PIV), an emerging immune cell count-based inflammatory index, is the global quantifier of systemic inflammation. This study analyses the levels of PIV and its association with various markers of IR.

Materials and Methods

This retrospective, cross-sectional study was done using the Center for Disease Control-National Health and Nutritional Examination Survey (CDC-NHANES) pre-pandemic data from 2017–2020. Data from 4620 survey participants was included after screening. Homeostasis model assessments of insulin resistance (HOMA-IR) and beta-cell function (HOMA-B), triglyceride glucose (TyG) index, visceral adiposity index (VAI), and lipid accumulation product (LAP) were used as markers of IR. Multiple logistic regression and trend analysis were done to determine the associations, and receiver operator characteristic curve (ROC) analysis was done to estimate the diagnostic utility of PIV to predict IR.

Results

PIV levels were significantly higher in obesity, diabetes, and metabolic syndrome. HOMA-IR, HOMA-B, LAP, VAI, and TyG levels were found to be higher in those with higher PIV (i.e., quartiles 4 and 3). Regression and trend analysis showed that the odds ratio for IR increased with PIV. However, ROC indicated that the diagnostic utility of PIV to predict IR is low compared to the other surrogate markers.

Conclusions

PIV levels differed significantly based on glycemic status, BMI, and metabolic syndrome status. PIV showed a significant positive association with IR. However, the ability of PIV to predict IR is not optimal compared to other surrogate markers.

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"

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The Utility of Serial Lipid Measurements as a Potential Predictor of Sepsis Outcome: A Prospective Observational Study in a Tertiary Care Hospital

Afrah Abdul Malick[1], Jeyakumar Manavalan[2*], Viveka Murugiah[1], Manikandan Bose[1], Hariharan Alexander[1], Suganthy Kanakasekaran[1]

[1] Velammal Medical College Hospitals and Research Institute, Madurai, Tamil Nadu, India

[2] Sri Manakula Vinayagar medical college and Hospital, Puducherry, India

ABSTRACT

Background and aim: Sepsis is the major cause of morbidity and mortality for patients admitted to an intensive care unit worldwide. Currently, procalcitonin (PCT) is a widely used prognostic marker for sepsis. The high cost of estimating Procalcitonin limits its utility in all health facilities. Lipid profile, being a frequently done routine investigation, is studied in sepsis patients to predict the prognosis of sepsis. This study was aimed to assess the association between lipid profile parameters, procalcitonin and clinical outcomes in patients with sepsis.

Materials and methods: It is a prospective observational study conducted in a tertiary care hospital in the Department of Biochemistry in collaboration with the Intensive Care Unit (ICU). We included 80 sepsis patients from medical and surgical ICUs. Among them, 59 (74%) survived and 21 (26%) expired. Serum lipid profile, procalcitonin and variables required for APACHE II score are measured at two intervals, one during admission and on day 5. All the parameters were compared between the survivors and the non-survivors.

Results: Serum PCT levels were reduced on day 5 [3.32 (1.27-11.86)] compared to day 0 [13.42 (5.77-33.18)] in survivors. In survivors, Total Cholesterol, LDL-C and Non-HDL-C were significantly elevated on day 5 compared to day 0. In non-survivors, HDL-C significantly decreased on day 5. Between survivors and non-survivors, HDL-C significantly decreased on day 5 (23.88 ± 10.19 vs 16.67 ± 8.27 mg/dl). A Negative correlation was observed between HDL-C & PCT.

Conclusion: Serum Lipid profile levels, namely Total cholesterol, HDL-C and LDL-C, have possible associations with the severity of sepsis. HDL-C have a negative association with the clinical scoring system in sepsis patients. Overall, the findings from our study suggest that lipid profile parameters have possible implications in predicting the outcome of patients with sepsis.

Keywords: sepsis, procalcitonin, HDL-cholesterol, triglycerides, APACHE II score

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INTRODUCTION

Sepsis is one of the most common causes of hospital admission worldwide and often requires an aggressive management protocol. Despite the advanced approach in management, sepsis accounts for the major cause of morbidity and mortality for patients admitted to an intensive care unit [1]. A prospective study conducted in a tertiary care hospital in India observed an ICU mortality of 56% and 28-day mortality of 62.8% [2].

Sepsis can be defined as life-threatening organ dysfunction caused by a dysregulated host response to infection [3]. Organ dysfunction can be identified clinically by an acute change in two or more SOFA (Sequential Organ Failure Assessment) points, along with either suspicion or evidence of infection [4]. Management protocol for sepsis patients comprises antibiotic therapy, adequate volume repletion and good glycaemic control. Despite aggressive treatment, the mortality rate due to sepsis is still high.

* Correspondence to: Jeyakumar Manavalan, Sri Manakula Vinayagar Medical College and Hospital, Puducherry, India. E-mail: drjaidyogi@gmail.com

Prof. T. THIRUNAVUKKARASU, M.D., D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625...

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Left conduction system pacing – An Ocean of opportunity

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R-wave peak time

Narula et al. [1] demonstrated that temporary His bundle pacing (HBP) could generate narrow paced QRS duration in the 1970s. it took another 3 decades, when Deshmukh et al. [2] pioneered the art of conduction system pacing by performing permanent HBP with conventional stylet driven leads in patients with atrial fibrillation and heart failure (HF). Over the next decade, HBP slowly gathered momentum driven by few impassioned implanters and the social media (#dontdisthehis) awareness [3]. However, the limitations of HBP led to the development of an alternative modality was developed by Huang et al. [4] to directly capture of left bundle branch fibers. With the shorter learning curve and stable pacing parameters, left bundle branch pacing (LBBP) has gained significant momentum in the last few years as an alternative to both right ventricular (RV) pacing and cardiac resynchronization therapy (CRT).

The left proximal bundle emerges from the central fibrous body beneath the endocardium of the subaortic septal region between the non-coronary and right coronary aortic cusps [5]. The fibers then run inferiorly for about 10–15mm reaching its maximum width before bifurcating into two main fascicles. The fibers of the anterior and posterior fascicles are differentiated while within the main LBB. The anterior fascicle is a thin bundle that sweeps across the outflow tract to reach the base of the anterior papillary muscle. The posterior fascicle thicker and shorter than the anterior one turns posteriorly to reach the base of the posterior papillary muscle. Septal fascicle arises as a subdivision from the posterior fascicle and less frequently from the anterior fascicle towards the septal surface of the left interventricular septum. Demoulin et al. [6] studied the branching pattern of LBB in 20 human hearts and demonstrated that the septal fascicle arose from main LBB in 5 cases, anterior fascicle in 3 cases, posterior fascicle in 6 cases and as a network of interconnected fasciculi from both anterior and posterior fascicles in the remaining 6 cases. Though there is a controversy about the bifascicular or trifascicular pattern of LBB arborization, the existence of a separate septal fascicle either arising from the main LBB or from the posterior fascicle cannot be disregarded.

LBBP involves deploying the pacing lead deep inside the proximal interventricular septum 1–1.5cm distal to the HB towards the RV apex. Rapid continuous rotations are required to drive the helix along with body of the lead to reach the LV sub-endocardium. Premature ventricular complexes (PVCs) generated during rapid deployment will change in morphology from QS to qR as the lead traverses from right to the left side of the septum [7]. Template beat which mimics the final paced QRS morphology is defined as a PVC with right bundle branch delay pattern [8]. LBB paced QRS morphology and axis depend on the site of lead deployment in the left conduction system. Capturing the left bundle trunk (LBT) before its bifurcation produces near normal QRS axis while the left posterior fascicule (LPF) or left anterior fascicule (LAF) capture results in either left or right axis deviation respectively. Pace mapping the right side of the septum before deploying the lead helps in predicting the site of capture with a R/Rs in lead-II results in LBT or LAF capture while rS/S in lead-II results in LPF capture.

There is still an unanswered question about the clinical outcomes of left bundle truncal pacing (LBTP) vs fascicular capture (LAFP/LPFP). A retrospective study [9] showed that in patients with LBBB associated non-ischemic cardiomyopathy and abnormal baseline QRS axis, LBTP provided similar improvement in clinical outcomes as compared to those with baseline normal QRS axis. Lin et al. [10], evaluated the pacing and physiological characteristics of different LBBP locations in patients with an intact conduction system. Among 68 patients included 51.5 % had LPFP, 25 % had LBTP and 23.5 % had LAFP. All 3 groups had similar paced QRS duration, ventricular activation time and pacing thresholds. Delayed right ventricular activation and interventricular dyssynchrony were similar between the groups. However, patients with baseline LBBB and LV dysfunction were excluded in this study. Liu et al. [11] evaluated the different pacing sites in patients with heart failure by including 43

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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ORIGINAL RESEARCH

CIED - PHYSIOLOGICAL PACING

Sex-Specific Outcomes of LBBAP Versus Biventricular Pacing

Results From I-CLAS

Faiz A. Subzposh, MD,[a] Parikshit S. Sharma, MD, MPH,[b] Óscar Cano, MD, PhD,[c] Shunmuga Sundaram Ponnusamy, MD, DM,[d] Bengt Herweg, MD,[e] Francesco Zanon, MD,[f] Marek Jastrzebski, MD, PhD,[g] Jiangang Zou, MD,[h] Mihail G. Chelu, MD, PhD,[i] Kevin Vernooy, MD, PhD,[j] Zachary I. Whinnett, MD, PhD,[k] Girish M. Nair, MBBS, MSc,[l] Manuel Molina-Lerma, MD,[m] Karol Curila, MD, PhD,[n] Kenneth A. Ellenbogen, MD,[o] Pugazhendhi Vijayaraman, MD[a]

ABSTRACT

BACKGROUND Cardiac resynchronization therapy (CRT) using biventricular pacing (BVP) has been associated with greater clinical improvement in women than men. Recently, left bundle branch area pacing (LBBAP) has been shown to be an alternative form of CRT.

OBJECTIVES The purpose of this study was to investigate sex-specific outcomes for death and heart failure events in a large, international, multicenter, cohort of patients undergoing CRT with BVP or LBBAP.

METHODS In this international study of 1,778 patients (575 female and 1203 male), sex-specific survival analysis was performed to compare the effect of LBBAP-CRT relative to BVP-CRT on the combined endpoint of death or heart failure hospitalization (HFH), and secondary endpoints of HFH only, and death alone.

RESULTS Female patients were more likely to have nonischemic cardiomyopathy and left bundle branch block (LBBB) and less likely to have hypertension, diabetes, or coronary artery disease than were male patients. Overall, female patients had a better result with LBBAP compared with BVP than did male patients, with a significant 36% reduction in death or HFH (HR: 0.64; 95% CI: 0.43 to 0.97; $P = 0.03$) and a significant 60% reduction in HFH alone (HR: 0.4; 95% CI: 0.24 to 0.69, $P < 0.01$). Women had a greater reduction in death or HFH among those with nonischemic cardiomyopathy (HR: 0.45 95% CI: 0.26 to 0.79; $P < 0.01$) and LBBB (HR: 0.49; 95% CI: 0.27 to 0.87; $P < 0.01$). Sex-specific echocardiographic outcomes were better in women than in men.

CONCLUSIONS Women obtained significantly greater reductions in the combined endpoint of death or HFH (primarily driven by reduction in HFH) with LBBAP compared with BVP among patients requiring CRT than did men.
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From the [a]Geisinger Heart Institute, Wilkes Barre, Pennsylvania, USA; [b]Rush University Medical Center, Chicago, Illinois, USA; [c]Hospital Universitari i Politècnic La Fe and Centro de Investigaciones Biomédicas en RED en Enfermedades Cardiovasculares,Valencia, Spain; [d]Velammal Medical College Hospital and Research Institute, Madurai, India; [e]University of South Florida Morsani College of Medicine, Tampa, Florida, USA; [f]Santa Maria Della Misericordia Hospital, Rovigo, Italy; [g]First Department of Cardiology, Interventional Electrocardiology and Hypertension, Jagiellonian University, Medical College, Krakow, Poland; [h]Department of Cardiology, The First Affiliated Hospital of Nanjing Medical University, Nanjing, Jiangsu, China; [i]Baylor College of Medicine and Texas Heart Institute, Houston, Texas, USA; [j]Department of Cardiology, Cardiovascular Research Institute Maastricht, Maastricht University Medical Center, Maastricht, the Netherlands; [k]National Heart and Lung Institute, Imperial College London, London, United Kingdom; [l]University of Ottawa Heart Institute, Ottawa, Ontario, Canada; [m]Hospital Universitario Virgen de las Nieves, Granada, Spain; [n]Cardiocenter, University Hospital Kralovske Vinohrady and Third Faculty of Medicine, Charles University, Prague, Czech Republic; and the [o]Virginia Commonwealth University Medical Center, Richmond, Virginia, USA.

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Dr. P. PAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin
Anuppanadi, Madurai-625

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Transvenous extraction of conduction system pacing leads: An international multicenter (TECSPAM) study

Pugazhendhi Vijayaraman, MD,[1] Rohan S. Trivedi, MD,[1] Jayanthi N. Koneru, MD,[2] Parikshit S. Sharma, MD, MPH,[3] Jan De Pooter, MD, PhD,[4] Robert D. Schaller, MD,[5] Óscar Cano, MD,[6] Zachary I. Whinnett, MD,[7] Federico Migliore, MD,[8] Shunmuga Sundaram Ponnusamy, MD,[9] Jamario R. Skeete, MD,[3] Francesco Zanon, MD,[10] Frederic V. Heuverswyn, MD,[4] Jeffrey Kolominsky, MD,[2] Raimondo Pittorru, MD,[8] Mishal Mumtaz, MD,[11] Kenneth A. Ellenbogen, MD,[2] Bengt Herweg, MD[11]

ABSTRACT

BACKGROUND Conduction system pacing (CSP) by His bundle pacing or left bundle branch area pacing (LBBAP) is incorporated into Heart Rhythm Society guidelines for the management of bradycardia and cardiac resynchronization therapy. Despite increasing adoption with both lumenless leads and stylet-driven leads, concerns regarding the feasibility and safety of the extraction of CSP leads remain.

OBJECTIVE The aim of the study was to report on the safety, feasibility, and clinical outcomes of the extraction of CSP leads.

METHODS Patients undergoing the extraction of CSP leads from 10 international centers were enrolled in this retrospective study. Data regarding indications, lead location, lead type, extraction tools, procedural success, complications, and reimplantation in the conduction system were collected.

RESULTS Overall, 341 patients (age 69 ± 15 years; female 117 (34%); cardiomyopathy 157 (46%); lead dwell time 22 ± 26 months) underwent the extraction of 224 His bundle pacing and 117 LBBAP leads (lumenless leads 321; stylet-driven leads 20). Complete procedural success was achieved in 338 (99%), while clinical success was 100% with retained distal fragments in 3 patients (1%). Among patients with a lead dwell time of >6 months (6–193 months; n = 226), manual extraction was successful in 198 (87%), mechanical tools in 22 (10%), and laser in 6 (3%). Femoral tools were necessary in 3 patients. Minor complications occurred in 7 patients (2.1%). Reimplantation in the conduction system was successful in 233 of 244 patients attempted (95%).

CONCLUSION The overall success rates of the extraction of CSP leads were very high (although the LBBAP lead dwell time was <3 years), with a low need for extraction tools and minimal complication. Reimplantation in the conduction system is feasible and safe.

KEYWORDS Conduction system pacing; Lead extraction; Left bundle branch area pacing; His bundle pacing; Extraction tools; Complications

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Introduction

Conduction system pacing (CSP) using His bundle pacing (HBP) and left bundle branch area pacing (LBBAP) has gained increasing adoption around the world.[1] In observational case control series, CSP seems to mitigate the adverse risks of heart failure hospitalization or death or the increased risk of atrial fibrillation.[2–6] CSP has also shown to be a reasonable alternative to biventricular pacing in patients requiring

From the [1]Geisinger Heart Institute, Wilkes-Barre, Pennsylvania, [2]Virginia Commonwealth University Medical Center, Richmond, Virginia, [3]Rush University Medical Center, Chicago, Illinois, [4]University Hospital Ghent, Ghent, Belgium, [5]Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania, [6]Hospital Universitari i Politècnic La Fe, Valencia, Spain, [7]Imperial College London, Rickmansworth, United Kingdom, [8]Department of Cardiac, Thoracic Vascular Sciences and Public Health University of Padova, Padova, Italy, [9]Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India, [10]Santa Maria Della Misericordia Hospital, Rovigo, Italy, and [11]University of South Florida Morsani College of Medicine, Tampa, Florida.

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin
Anuppanadi, Madurai

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Left bundle branch pacing lead for sensing ventricular arrhythmias in implantable cardioverter-defibrillator: A pilot study (LBBP-ICD study)

Shunmuga Sundaram Ponnusamy, MD, DM, CEPS-A,[1] Vadivelu Ramalingam, MD, DM,[1] Selvaganesh Mariappan, MD, DM,[1] Vithiya Ganesan, MD,[2] Vijesh Anand, MD, DNB,[1] Thabish Syed, MBBS, DNB,[1] Senthil Murugan, MD, DNB,[1] Mahesh Kumar, MD, DM,[1] Pugazhendhi Vijayaraman, MD, FHRS[3]

ABSTRACT

BACKGROUND Left bundle branch pacing (LBBP) has been suggested as an alternative modality for biventricular pacing in cardiac resynchronization therapy (CRT)–eligible patients. As it provides stable R-wave sensing, LBBP has been recently used to provide sensing of ventricular arrhythmia in patients receiving implantable cardioverter-defibrillator (ICD) with CRT.

OBJECTIVE The aim of this study was to analyze the long-term safety and efficacy of the LBBP lead for appropriate detection of ventricular arrhythmia and delivery of antitachycardia pacing (ATP) in patients requiring defibrillator therapy with CRT.

METHODS CRT-eligible patients who underwent successful LBBP-optimized ICD and LBBP-optimized CRT with defibrillator were enrolled. The LBBP lead was connected to the right ventricular-P/S port after capping the IS-1 connector plug of the DF-1–ICD lead. LBBP-optimized ICD or LBBP-optimized CRT with defibrillator was decided on the basis of correction of conduction system disease. Documented arrhythmic episodes and therapy delivered were analyzed.

RESULTS Thirty patients were enrolled. The mean age was 59.7 ± 10.5 years. LBBP resulted in an increase in left ventricular ejection fraction from 29.9% ± 4.6% to 43.9% ± 11.2% ($P < .0001$). During a mean follow-up of 22.9 ± 12.5 months, 254 ventricular arrhythmic events were documented. Appropriate events (n = 225 [89%]) included nonsustained ventricular tachycardia (VT) (n = 212 episodes [94%]), VT (n = 8 [3.5%]), and ventricular fibrillation (n = 5 [2.5%]). ATP efficacy in terminating VT was 75%. Eleven percent of episodes (n = 29) were inappropriately detected because of T-wave oversensing. Inappropriate therapy (ATP) was delivered for 14 episodes (5.5%). Three patients (10%) had worsening of tricuspid regurgitation.

CONCLUSION Sensing from the LBBP lead for arrhythmia detection is safe as ~90% of the episodes were detected appropriately. Future studies with a dedicated LBBP-defibrillator lead along with algorithms to avoid oversensing can help in combining defibrillation with conduction system pacing.

KEYWORDS Left bundle branch pacing; LOT-ICD; LOT-CRT-D; T-wave oversensing; Cardiac resynchronization therapy; Heart failure

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Introduction

Cardiac resynchronization therapy (CRT) using biventricular pacing (BVP) is a well-established therapy for patients with symptomatic heart failure and wide QRS duration.[1–3] Implantable cardioverter-defibrillators (ICDs) are effective in preventing sudden cardiac arrest in patients with left ventricular (LV) dysfunction. Guidelines have recommended ICDs as a class I indication for primary prevention of sudden cardiac death in patients with heart failure with reduced ejection fraction.[4,5] Conventionally ICD leads are placed in the right ventricle

From the [1]Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India, [2]Department of Microbiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India, and [3]Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes-Barre, Pennsylvania.

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Prof. T. THIRUNAVUKKARASU, M.D., D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Systematic review and meta-analysis of early aortic valve replacement versus conservative therapy in patients with asymptomatic aortic valve stenosis with preserved left ventricle systolic function

Nagendra Boopathy Senguttuvan ,[1] Nishok Victory Srinivasan,[2] Manokar Panchanatham,[1] Rizwan Suliankatchi Abdulkader,[3] Asuwin Anandaram,[2] Dinesh Reddy Polareddy ,[1] Sankaran Ramesh,[1] Harsimran Singh,[1] Hanumath Yallanki,[4] Dhamodaran Kaliyamoorthi,[5] Sundar Chidambaram,[6] Vadivelu Ramalingam,[7] Ravindran Rajendran,[8] Thoddi Ramamurthy Muralidharan,[1] Ravindar Rao,[9] Ashok Seth,[10] Bimmer Claessen,[11] Parasuram Krishnamoorthy[12]

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For numbered affiliations see end of article.

Correspondence to
Prof Nagendra Boopathy Senguttuvan; drsnboopathy@gmail.com

ABSTRACT

Background A quarter of patients with severe aortic stenosis (AS) were asymptomatic, and only a third of them survived at the end of 4 years. Only a select subset of these patients was recommended for aortic valve replacement (AVR) by the current American College of Cardiology/American Heart Association guidelines. We intended to study the effect of early AVR (eAVR) in this subset of asymptomatic patients with preserved left ventricle function.

Methods and results We searched PubMed and Embase for randomised and observational studies comparing the effect of eAVR versus conservative therapy in patients with severe, asymptomatic AS and normal left ventricular function. The primary outcome was all-cause mortality. The secondary outcomes were composite major adverse cardiac events (MACE) (study defined), myocardial infarction (MI), stroke, cardiac death, sudden death, the development of symptoms, heart failure hospitalisations and major bleeding. We used GRADEPro to assess the certainty of the evidence. In the randomised controlled trial (RCT) only analysis, we found no significant difference in all-cause mortality between the early aortic intervention group versus the conservative arm (CA) (incidence rate ratio, IRR (CI): 0.5 (0.2 to 1.1), I^2=31%, p=0.09). However, in the overall cohort, we found mortality benefit for eAVR over CA (IRR (CI): 0.4 (0.3 to 0.7), I^2=84%, p<0.01). There were significantly lower MACE, cardiac death, sudden death, development of symptoms and heart failure hospitalisations in the eAVR group. We noticed no difference in MI, stroke and major bleeding.

Conclusion We conclude that there is no reduction in all-cause mortality in the eAVR arm in patients with asymptomatic AS with preserved ejection fraction. However, eAVR reduces heart failure related hospitalisations and death or heart failure hospitalisations.

PROSPERO registration number CRD42022306132.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Limited data is available on timing of intervention/surgery in patient with asymptomatic severe aortic stenosis (AS) with preserved left ventricular (LV) function. Multiple observational studies have suggested that early AVR (eAVR) may be helpful in such patients.

WHAT THIS STUDY ADDS

⇒ We conclude that there is no reduction in all-cause mortality in the eAVR arm in patients with asymptomatic AS with preserved ejection fraction. We also emphasise that insufficient evidence from the current meta-analysis to state eAVR reduces all-cause mortality in patients with asymptomatic AS with preserved ejection fraction. However, our meta-analysis shows that eAVR reduces heart failure related hospitalisations and death or heart failure hospitalisation. This will enable the process of 'shared decision-making' in the management of patients with asymptomatic severe AS with preserved LV function.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ We suggest that a large, adequately powered randomised controlled trial be performed to answer the above question before recommending eAVR in such patients. However, providing the information of no reduction in mortality with eAVR with a concurrent reduction in heart failure hospitalisation is essential in managing such patients.

INTRODUCTION

Aortic valve replacement (AVR) is the treatment of choice in symptomatic patients with severe aortic stenosis (AS) or who have

Prof. T. THANGARAJ, M.S., M.Ch., Dean
Velammal Medical College Hospital and Research Institute "Velammal Village" Madurai-Tuticorin Ring Road Anuppanadi, Madurai-625 009, T.N.

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Research Brief

Safety and efficacy of protamine after transcatheter aortic valve replacement

Lakshmi Durga Kumaraguruparan [a], Asuwin Anandaram [b], Kamalakkannan G. Sambandam [c], Yogapriya Chidambaram [d], Bharath Raj Kidambi [e], Gautam Ganesan Karthikeyan [f], Madhesh Kasi [d], Rizwan Suliankatchi Abdulkader [g], Sankaran Ramesh [a], Vadivelu Ramalingam [h], Ravindran Rajendran [i], Nagendra Boopathy Senguttuvan [a,*]

[a] Department of Cardiology, Sri Ramachandra Institute of Higher Education and Research (SRIHER), No.1, Ramachandra Nagar, Porur, Chennai, Tamil Nadu, 600116, India
[b] Department of Internal Medicine, Lehigh Valley Health Network, Allentown, PA, 18101, United States
[c] Department of Cardiac Anaesthesia, Sri Ramachandra Institute of Higher Education and Research (SRIHER), No.1, Ramachandra Nagar, Porur, Chennai, Tamil Nadu, 600116, India
[d] Department of Clinical Research, Sri Ramachandra Institute of Higher Education and Research (SRIHER), No.1, Ramachandra Nagar, Porur, Chennai, Tamil Nadu, 600116, India
[e] Department of Cardiology, Al Dhannah Hospital, Ruwais, Abu Dhabi, United Arab Emirates
[f] Department of Cardiology, PSRI Hospital, New Delhi, India
[g] National Institute of Epidemiology, ICMR, Chennai & Department of Statistics, Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli, Tamil Nadu, India
[h] Department of Cardiology, Velammal Medical College and Hospital, Madurai, India
[i] Department of Cardiology, Apollo Hospitals, Trichy, India

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ABSTRACT

Transfemoral Trans-catheter Aortic Valve Replacement (TF-TAVR) is a safe alternative to surgical aortic valve replacement (SAVR). Protamine is used to reverse heparin and reduce post-TAVR bleeding, but concerns about risks like valve thrombosis and stroke remain. This systematic review and meta-analysis, following PRISMA guidelines, found no statistically significant difference in major bleeding complications between the protamine and control groups [(3.0 % vs. 14.4 %); RR: 0.56; P = 0.16]. No differences were noted in life-threatening bleeding, blood transfusions, 30-day mortality, or stroke. Protamine appears safe post-TAVR without increasing stroke risk, but its effectiveness in reducing bleeding needs further investigation through a multi-centric randomized study.

1. Introduction

Transcatheter aortic valve replacement is approved for all elderly patients with severe aortic stenosis. Bleeding and vascular complications after TAVR remain significant contributors to mortality and morbidity post-TAVR. Hence, many centers have routinely started using protamine to reverse the effect of heparin post-TAVR. According to the latest data, using protamine sulfate (PS) in TAVR procedures has significantly increased. An analysis conducted by Zbroński et al between March 2010 and November 2016 indicated that 21 % of patients received PS to reverse the effect of unfractionated heparin (UFH) .[1] In a subsequent study by the same authors, 56 % of patients were administered PS during TAVR procedures.[2] Our current study, which includes data from two observational studies and one randomized controlled trial, indicates that 65.8 % of patients undergoing TAVR are now administered PS. Additionally, unpublished data from the author's center suggests that the usage of PS has increased to as high as 80 %. This reflects a growing trend towards the routine use of PS in clinical practice to mitigate bleeding risks associated with TAVR procedures.

However, few recent reports suggest the need for caution in using

* Corresponding author.
E-mail addresses: laks.kid@gmail.com (L.D. Kumaraguruparan), asuwin99@gmail.com (A. Anandaram), anaeskamal2006@gmail.com (K.G. Sambandam), yogapriyac96@gmail.com (Y. Chidambaram), drbkid@gmail.com (B.R. Kidambi), gautam1998@gmail.com (G.G. Karthikeyan), kmadhesh19498@gmail.com (M. Kasi), sarizwan1986@gmail.com (R.S. Abdulkader), sankaranramesh39@gmail.com (S. Ramesh), vvelu00@gmail.com (V. Ramalingam), rravindranrajendran@gmail.com (R. Rajendran), nagendraboopathy@sriramachandra.edu.in, drsnboopathy@gmail.com (N.B. Senguttuvan).

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ORIGINAL RESEARCH

New-Onset Left Ventricular Dysfunction After Left Bundle Branch Pacing

Shunmuga Sundaram Ponnusamy, MD, DM, CEPS-A,[a] Vithiya Ganesan, MD,[b] Sudharshana Nagalingam, BE,[c] Vadivelu Ramalingam, MD, DM,[a] Selvaganesh Mariappan, MD, DM,[a] Habibullah Moghal, MD, DNB,[a] Senthil Murugan, MD, DNB,[a] Mahesh Kumar, MD, DM,[a] Riya Joseph, MBBS,[a] Pugazhendhi Vijayaraman, MD[d]

ABSTRACT

BACKGROUND Left bundle branch pacing (LBBP) provides stable pacing parameters and has been suggested as an alternative for right ventricular pacing and cardiac resynchronization therapy.

OBJECTIVES The aim of the study was to assess the incidence and etiology of new-onset left ventricular dysfunction (NOLVD) following LBBP in patients with baseline normal left ventricular (LV) function and cardiomyopathy patients with normalized LV function.

METHODS Patients undergoing successful LBBP for symptomatic bradyarrhythmia or as an alternative to cardiac resynchronization therapy were included. Normalization of LV function was defined as improvement in LV ejection fraction to ≥50%. Patients with baseline normal LV function and those with recovered LV function after LBBP constituted the study group. Loss of conduction system capture (LOCSC) was defined as complete or partial loss of right bundle branch delay pattern along with inability to demonstrate capture transition during threshold assessment.

RESULTS A total of 426 patients were included; 59% (n = 250) had baseline normal LV function (group I) and 41% (n = 176) had recovered LV function after LBBP (group II). Mean follow-up duration of 28.3 ± 16.7 months. NOLVD was noted in 3.75% (n = 16; group I = 5 and group II = 11) of patients. The etiologies for NOLVD were LOCSC in 62.5% (n = 10), suboptimal atrioventricular (AV) delay in 18.7% (n = 3), atrial fibrillation in 6.3% (n = 1), and idiopathic in 12.5% (n = 2). LOCSC occurred at a mean interval of 9.2 ± 6.4 months after the initial implantation. Reinterventions (n = 6) including lead repositioning, AV delay optimization, and AV junction ablation resulted in renormalization of LV function in all 6 patients.

CONCLUSIONS Periodic assessment in device clinic is required because NOLVD from reversible causes can occur during follow-up in patients after LBBP. (JACC Clin Electrophysiol. 2024;■:■-■) © 2024 by the American College of Cardiology Foundation.

Right ventricular apical or septal pacing (RVP) has been the standard site of pacing for patients with symptomatic bradyarrhythmia for several decades. However, RVP has been shown to be associated with abnormal electrical and mechanical synchrony resulting in delayed left ventricular (LV) activation, increased LV end-systolic volume, and reduced LV systolic function.[1-3] Pacing-induced

From the [a]Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, India; [b]Department of Microbiology, Velammal Medical College and Research Institute, Madurai, India; [c]Medtronic India Private Limited, India; and the [d]Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes Barre, Pennsylvania, USA.
The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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Dr. T. THIYAGARAJAN, M.D., D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Image

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Late distal conductor fracture of the lumenless pacing lead after left bundle branch area pacing

Vickram Vignesh Rangaswamy, MD, DM,[1] Shunmuga Sundaram Ponnusamy, MD, DM, CEPS[2]

KEYWORDS Left bundle branch area pacing; Lumenless pacing lead; Distal conductor fracture

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A 75-year-old man with intermittent atrioventricular block and left ventricular dysfunction underwent successful left bundle branch area pacing after 4 attempts using the C315HIS catheter and 3830 SelectSecure lumenless lead (Medtronic, Minneapolis, MN) by premature ventricular complex–guided approach[1] (Figure 1A; Online Supplemental Video 1). The unipolar pacing threshold was 0.8 V/0.5 ms with a sensed R-wave amplitude of 7 mV and a unipolar pacing impedance of 640 Ω. The delivery catheter was removed after providing lead slack in the atrium (Figure 1A). The patient presented

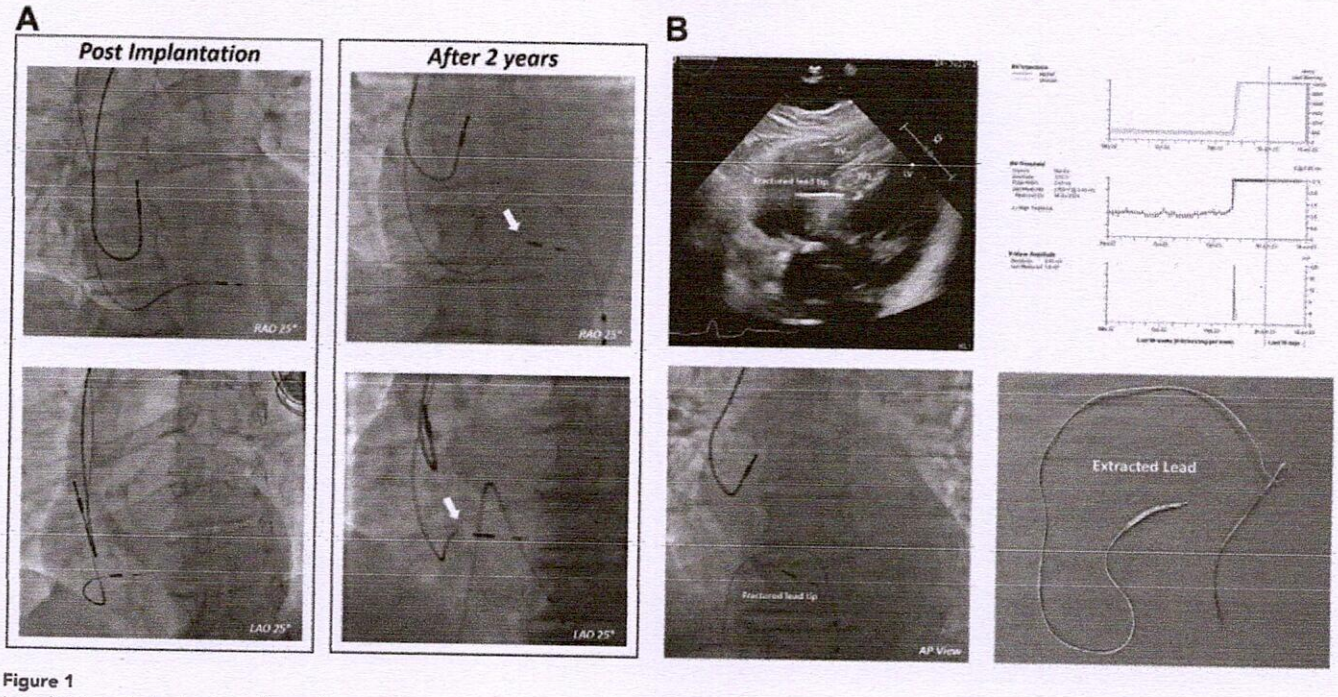


Figure 1
Late distal conductor fracture of lumenless pacing lead. A: Fluoroscopy images in right anterior oblique (RAO) and left anterior oblique (LAO) view of the lumenless pacing lead immediate post implantation and after 2 years. Note the (white arrow-head) fracture of the lead proximal to ring electrode. B: Echocardiography and fluoroscopy images immediately after extraction showing the retained distal end of the lead. Note the sudden rise in pacing impedance and capture threshold after lead fracture.

From the [1]Department of Cardiology, Sri Ramakrishna Hospital, Coimbatore, Tamil Nadu, India, and [2]Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India.

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
& Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Feasibility, safety, and short-term follow-up of defibrillator lead at left bundle branch area pacing location: A pilot study

Shunmuga Sundaram Ponnusamy, MD, DM, CEPS-A,[1] Vithiya Ganesan, MD,[2] Pugazhendhi Vijayaraman, MD, FHRS[3]

ABSTRACT

BACKGROUND Left bundle branch area pacing (LBBAP) has been increasingly adopted as an alternative modality to cardiac resynchronization therapy (CRT). The feasibility and safety of using an LBBAP lead to provide sensing of ventricular arrhythmia in patients receiving an implantable cardioverter-defibrillator (ICD) with CRT has been demonstrated recently.

OBJECTIVES The purpose of our study was to analyze the feasibility, safety, and short-term follow-up of a traditional defibrillator lead at the LBBAP location.

METHODS Patients who underwent successful LBBAP defibrillator using DF-1/DF-4 lead and delivery catheter were included in the study. Defibrillation threshold (DFT) testing was performed after implantation to assess the ability of the LBBAP defibrillator lead to sense and provide appropriate therapy for ventricular arrhythmia.

RESULTS Although the ICD lead could be successfully deployed in the left bundle branch area in 7 of 8 patients, it was repositioned to the right ventricular (RV) apex because of atrial oversensing in 1 patient and cheesy septum in another patient. Acute procedural success was 62.5% (5/8 patients). Mean patient age was 62.6 ± 21.6 years. Mean procedural duration was 115.6 ± 38.1 minutes, with LBBAP defibrillator lead fluoroscopy duration of 10.6 ± 3.5 minutes. Mean capture threshold was 0.58 ± 0.23V/0.4 ms, sensed R-wave amplitude 9.6 ± 2.2 mV, pacing impedance 560 ± 145 Ω, and shock impedance 65.4 ± 5.5 Ω. Defibrillation testing was successful in inducing ventricular fibrillation and could be sensed and reverted promptly by the shock delivered through the lead. During mean follow-up of 3.8 ± 2.2 months, pacing parameters remained stable. No episodes of inappropriate arrhythmia detection or therapy delivery occurred during follow-up.

CONCLUSION LBBAP defibrillator is feasible, safe, and effective during short-term follow-up. DFT testing at the time of implantation will help to ensure appropriate sensing and treatment of ventricular arrhythmias.

KEYWORDS Left bundle branch area pacing; Left bundle branch area pacing defibrillator; Left bundle branch pacing optimized implantable cardioverter-defibrillator; Cardiac resynchronization therapy; Heart failure

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Introduction

Cardiac resynchronization therapy (CRT) by biventricular pacing has been the standard treatment of patients with heart failure, reduced left ventricular (LV) ejection fraction, and wide QRS duration.[1,2] Recent studies have shown left bundle branch area pacing (LBBAP) to be an effective alternative modality because it provides better electrical and mechanical synchronization.[3–5] It also is useful in preventing chronic right ventricular (RV) pacing-induced cardiomyopathy in patients with symptomatic bradyarrhythmia.[6] The procedure involves deploying the pacing lead deep inside the proximal interventricular septum to capture the broad fan of left bundle branch (LBB) fibers on the LV subendocardium. Implantable cardioverter-defibrillators (ICDs) are effective in reducing the mortality rate in patients with heart failure and reduced ejection and with recommended Class I indications for preventing sudden cardiac death.[7] Traditionally, the ICD leads are positioned at

From the [1]Department of Cardiology, Velammal Medical College, Madurai, India, [2]Department of Microbiology, Velammal Medical College, Madurai, India, and [3]Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes Barre, Pennsylvania.

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Conduction system pacing compared with biventricular pacing for cardiac resynchronization therapy in patients with heart failure and mildly reduced left ventricular ejection fraction: Results from International Collaborative LBBAP Study (I-CLAS) Group

Pugazhendhi Vijayaraman, MD, FHRS,[1] Francesco Zanon, MD, FHRS,[2] Shunmuga Sundaram Ponnusamy, MD,[3] Bengt Herweg, MD, FHRS,[4] Parikshit Sharma, MD, MPH, FHRS,[5] Manuel Molina-Lerma, MD,[6] Marek Jastrzębski, MD, PhD,[7] Zachary Whinnett, MD, PhD,[8] Kevin Vernooy, MD, PhD,[9] Rajeev K. Pathak, MBBS, PhD,[10] Roderick Tung, MD, FHRS,[11] Gaurav Upadhyay, MD, FHRS,[12] Karol Curila, MD, PhD,[13] Dipen Zalavadia, MD,[1] Nischay Shah, MD,[1] Lina Marcantoni, MD,[2] Mohamed Gad, MD,[14] Ramez Morcos, MD,[1] Pawel Moskal, MD,[7] Akriti Naraen, MD,[8] Mishal Mumtaz, MD,[4] Jamario R. Skeete, MD,[5] Praneet S. Katrapati, MD,[11] Jeffrey Kolominsky, MD,[15] Johan van Koll, MD,[9] Mihail G. Chelu, MD, PhD, FHRS,[14] Kenneth A. Ellenbogen, MD, FHRS,[15] Oscar Cano, MD, PhD[16]

ABSTRACT

BACKGROUND Cardiac resynchronization therapy (CRT) is a guideline-recommended therapy in patients with heart failure with mildly reduced ejection fraction (HFmrEF, 36%–50%) and left bundle branch block or indication for ventricular pacing. Conduction system pacing (CSP) using left bundle branch area pacing or His bundle pacing has been shown to be a safe and physiologic alternative to biventricular pacing (BVP).

OBJECTIVE The aim of this study was to compare the clinical outcomes between BVP and CSP for patients with HFmrEF undergoing CRT.

METHODS Consecutive patients who underwent BVP or CSP with HFmrEF between January 2018 and June 2023 at 16 international centers were included. The primary outcome was the composite end point of time to death or heart failure hospitalization (HFH). Secondary end points included change in left ventricular ejection fraction (LVEF) and individual end points of death and HFH.

RESULTS A total of 1004 patients met inclusion criteria: BVP, 178; CSP, 826 (His bundle pacing, 154; left bundle branch area pacing, 672). Mean age was 73 ± 13 years; female, 34%; and LVEF, 42% ± 5%. Paced QRS duration in CSP was significantly narrower compared with BVP (129 ± 21 ms vs 144 ± 19 ms; $P < .001$). LVEF improved during follow-up in both groups (49% ± 10% vs 48% ± 10%; $P = .32$). CSP was independently associated with significant reduction in the primary end point of time to death or HFH compared with BVP (22% vs 34%; hazard ratio, 0.64; 95% confidence interval, 0.43–0.94; $P = .025$).

CONCLUSION CSP was associated with improved clinical outcomes compared with BVP in this large cohort of patients with HFmrEF undergoing CRT. Randomized controlled trials comparing CSP with BVP will be necessary to confirm these results.

From the [1]Geisinger Heart Institute, Wilkes Barre, Pennsylvania, [2]Santa Maria della Misericordia Hospital, Rovigo, Italy, [3]Velammal Medical College Hospital and Research Institute, Madurai, India, [4]USF Morsani College of Medicine, Tampa, Florida, [5]Rush University, Chicago, Illinois, [6]Hospital Universitario Virgen de las Nieves, Granada, Spain, [7]First Department of Cardiology, Interventional Electrocardiology and Hypertension, Jagiellonian University, Kraków, Poland, [8]Imperial College, London, United Kingdom, [9]Department of Cardiology, Cardiovascular Research Institute Maastricht (CARIM), Maastricht University Medical Center, Maastricht, The Netherlands, [10]Australian National University, Canberra Heart Rhythm, Canberra, Australia, [11]Banner Health, Phoenix, Arizona, [12]University of Chicago, Chicago, Illinois, [13]Charles University, Prague, Czech Republic, [14]Baylor College of Medicine, Houston, Texas, [15]VCU Health System, Richmond, Virginia, and [16]Hospital Universitari i Politècnic La Fe and Centro de Investigaciones Biomédicas en RED en Enfermedades Cardiovasculares, Valencia, Spain.

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Is left bundle branch pacing (LBBP) associated with better depolarization and repolarization kinetics than right ventricular mid septal pacing (RVSP)? - Comparison of frontal QRS -T angle in patients with LBBP, RVSP and normal ventricular conduction

Vadivelu Ramalingam [a,*], Shunmugasundaram Ponnusamy [a], Rizwan Suliankatchi Abdulkader [b], Senthil Murugan [a], Selvaganesh Mariyappan [a], Jeyashree Kathiresan [b], Mahesh Kumar [a], Vijesh Anand [a]

[a] Department of Cardiology, Velammal Medical College Hospital, Madurai, 625009, Tamil Nadu, India
[b] National Institute of Epidemiology, Indian Council of Medical Research, Second Main Road, Tamil Nadu Housing Board, Ayapakkam, Chennai, 600077, Tamil Nadu, India

ARTICLE INFO

Keywords:
Frontal QRS-T angle
Left bundle branch pacing
QRS duration
Depolarization
AV block
Pacing induced cardiomyopathy

ABSTRACT

Aims: To assess the frontal QRS- T angle (f QRS- T angle) in patients with left bundle branch pacing (LBBP) as compared to right ventricular mid septal pacing (RVSP) implanted for symptomatic high degree atrioventricular (AV) block and to compare with control subjects with normal ventricular conduction (CSNVC)

Methods: A total of one-fifty subjects were chosen (50 patients with LBBP, 50 patients with RVSP and 50 CSNVC). The indication for pacemaker implantation was symptomatic high degree AV block. Baseline clinical and electrocardiogram (ECG) parameters like QRS duration (QRSD), QRS axis and f QRS-T angle and Ejection Fraction (EF) were assessed. f QRS-T angle was measured as the difference between the computerised mean frontal QRS and T wave axes in the limb leads. If the difference between the QRS axis and T-wave axis exceeds 180°, then the resultant QRS-T angle would be calculated as 360° minus the absolute angle to obtain a value between 0° and 180°. Baseline, immediate post procedural and 6 month follow up (f/u) ECGs and EF were chosen for the analysis.

Results: Patients who underwent LBBP had significantly shorter paced QRSD than patients who had undergone RVSP (112 ± 12 ms vs 146 ± 13 ms; 95 % confidence interval (CI): 43, −31; **p<0.001**). There was no significant difference in the QRSD before and after LBBP. The QRSD before and after pacing in RVSP was 111 ± 27 ms and 146 ± 13 ms; 95 % CI: 43, −28; **p < 0.001**. The QRSD in control patients with NVC was 82.94 ± 9.59 ms. RVSP was associated with wider f QRS-T angle when compared with LBBP (103 ± 53° vs 82 ± 43°; 95 % CI: 39, −1.0; **p = 0.037**). The baseline and immediate post procedure f QRS-T angle in LBBP was 70 ± 48° and 82 ± 43°; 95 % CI: 31, 5.3; p = 0.2. At 6 months f/u, the f QRS-T angle was 61 ± 43°; 95 % CI: 8.5, 35; **p=0.002**. The baseline and immediate post procedure f QRS-T angle in RVSP was 67 ± 51° and 103 ± 53°; 95 % CI: 54, −17; **p < 0.001**. At 6 months f/u, the f QRS-T angle in RVSP group was 87 ± 58°; 95 % CI: 2.6, 29; **p = 0.020**. The f QRS T angle in control patients with NVC was 24 ± 16°. When subgroup analysis was done the difference in the f QRS-T angle was significant between RVSP and LBBP groups only in patients who had wide QRS escape. The mean LVEF at 6-month follow-up in LBBP vs RVSP was 61 ± 3.7 % vs 57.1 ± 7.8 %; 95 % CI:1.48, 6.32, ***p = 0.002***. In the RVSP group, three patients developed pacing induced cardiomyopathy (PIC) whereas no patients in the LBBP group developed PIC at 6-month follow-up; **p=0.021**. One patient with PIC had deterioration of functional status with new onset HF symptoms. The patient symptoms improved with medical therapy and needed no hospitalisation. The patient declined further interventions including upgradation to CRT or LBB pacing. No deaths or ventricular arrhythmias were observed during the study period.

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* Corresponding author. Department of Cardiology, Velammal Medical College Hospital, Madurai, Tamil Nadu, 625009, India.
E-mail address: vvelu00@gmail.com (V. Ramalingam).

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009

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ORIGINAL RESEARCH

PACING THERAPY

Retrograde Conduction in Left Bundle Branch Block

Insights From Left Bundle Branch Pacing

Shunmuga Sundaram Ponnusamy, MD, DM, CEPS-A,[a] William Basil, BE,[b] Vithiya Ganesan, MD,[c] Thabish Syed, MBBS, DNB,[a] Vadivelu Ramalingam, MD, DM,[a] Selvaganesh Mariappan, MD, DM,[a] Vijesh Anand, MD, DNB,[a] Senthil Murugan, MD, DNB,[a] Mahesh Kumar, MD, DM,[a] Pugazhendhi Vijayaraman, MD[d]

ABSTRACT

BACKGROUND Biventricular pacing is a well-established therapy for patients with heart failure (HF), left bundle branch block (LBBB) and left ventricular (LV) dysfunction. Left bundle branch pacing (LBBP) has emerged as an alternative to biventricular pacing.

OBJECTIVES The aim of this study was to assess the retrograde conduction properties of the left bundle branch in patients with nonischemic cardiomyopathy and LBBB during LBBP and its clinical implications.

METHODS Patients undergoing successful LBBP for nonischemic cardiomyopathy with LV ejection fraction (LVEF) ≤35% and LBBB were included. Continuous recording of His potential was performed using a quadripolar catheter. Unidirectional block was defined as retrograde His bundle activation during LBBP with stimulus to His potential (SH) duration less than or equal to antegrade HV interval and bidirectional block as VH dissociation or SH duration greater than HV interval. HF hospitalization, ventricular arrhythmias, and mortality were documented.

RESULTS A total of 165 patients were included. The mean follow-up duration was 21.8 ± 13.1 months. Bidirectional block (group I) was observed in 82% (n = 136), and these patients were noted to have advanced HF stage and prolonged baseline QRS duration. Unidirectional block (group II) with intact retrograde conduction was observed in 18% (n = 29) and was associated with narrow paced QRS duration and higher LVEF during follow-up. Super-response (LVEF ≥50%) was observed in 54.4% (n = 74) in group I compared with 73.3% (n = 22) in group II ($P = 0.03$). The OR for LVEF normalization was 4.1 (95% CI: 1.26-13.97; $P = 0.02$), with unidirectional block compared with bidirectional block in patients with LBBB and LV dysfunction. Adverse clinical outcomes as measured by a composite of HF hospitalization, ventricular arrhythmias, and mortality were significantly higher in group I compared with group II (12.5% vs 0%; $P = 0.04$).

CONCLUSIONS Bidirectional block in LBBB was characterized by advanced HF symptoms, while unidirectional block was associated with better clinical outcomes after cardiac resynchronization therapy by LBBP.
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From the [a]Department of Cardiology, Velammal Medical College, Madurai, India; [b]Medtronic India, Mumbai, India; [c]Department of Microbiology, Velammal Medical College, Madurai, India; and the [d]Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes-Barre, Pennsylvania, USA.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Perceptions on Medical Professionalism Among Future Healthcare Professionals: A Mixed Method Study

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Vijaya Ramanathan [1, 2], Punita Pushpanathan [3], Trupti Bodhare [4], Samir Bele [5]

1. Anatomy, All India Institute of Medical Sciences, Madurai, IND 2. Anatomy, Meenakshi Medical College Hospital & Research Institute, Meenakshi Academy of Higher Education & Research (Deemed to be University), Kanchipuram, IND 3. Physiology, Meenakshi Medical College Hospital & Research Institute, Meenakshi Academy of Higher Education & Research (Deemed to be University), Kanchipuram, IND 4. Community & Family Medicine, All India Institute of Medical Sciences, Madurai, IND 5. Community Medicine, Velammal Medical College Hospital & Research Institute, Madurai, IND

Corresponding author: Trupti Bodhare , drtruptib@gmail.com

Abstract

Background

Accreditation councils across the world constantly examine policies and practices in professionalism in their medical curriculum. The National Medical Commission (NMC) in India has recognized the pressing need to reform and include professionalism in its undergraduate curriculum.

Objectives

The objective of this study was to explore the perspectives of medical and nursing students on professional behavior, suitable teaching-learning methods, and assessment strategies for curriculum integration.

Methodology

The study utilized a concurrent triangulation mixed method design, collecting both qualitative and quantitative data simultaneously to gain a comprehensive understanding of medical and nursing students' perceptions of professionalism. It included 83 final-year undergraduate medical students and 42 final-year undergraduate nursing students. The approval of the Institutional Review Board of Meenakshi Medical College Hospital & Research Institute was obtained. A semi-structured questionnaire consisting of demographic characteristics and opinions regarding academic professional behavior, teaching-learning, and evaluation of professionalism was used. Perceptions regarding the meaning of professionalism, behavior of professionalism to be emphasized in teaching, and pressing challenges of professionalism were explored. Students were also asked to rank the best behavior associated with professionalism. Frequency and percentages were used for descriptive statistics. Means and standard deviations were calculated for continuous variables. An unpaired t-test was used to determine a statistically significant difference between the means in the two groups. The quantitative data was analyzed with R programming and content analysis was performed for the qualitative data using ATLAS.ti qualitative data analysis software.

Results

Unexplained/unauthorized absence from academic activities (2.39 ± 1.553), not following the timeline (2.41 ± 1.560), making fun of patients and peers (2.16 ± 1.619), cheating in the exams (2.37 ± 1.651), and inebriation (2.39 ± 1.666) were unacceptable behaviors by undergraduate medical students compared with nursing students. Clinical experience (1.54 ± 0.857) and role models (1.74 ± 0.935) were the highly acceptable methods of teaching professionalism and interprofessional interactions (1.58 ± 0.650) and awards (1.98 ± 1.100) were the most common suggestions to improve the course curriculum by both groups. Community/field activity (1.78 ± 0.860) and clinical examination (1.89 ±1.123) were the most preferred methods of evaluation of professionalism. According to the students, dedication, honesty, respect, and self-improvement were identified as the best behaviors associated with professionalism.

Conclusions

The study revealed that students had a wide range of perspectives about professionalism. Different unprofessional acts were acceptable to students. The causes of these perspectives need to be explored and resolved to promote professionalism. Students identified the need for strong positive role models and frequent clinical experiences, along with improved interprofessional interactions and awards to improve teaching and learning professionalism. Community/field activity was the preferred assessment method proposed by the students. Medical institutions must promote these components in curriculum, faculty development, and clinical settings to foster the development of professionalism among students.

Prof. R. Thiruvasagamani BASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Alagappanagar, Madurai-625 009, T.N.

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Perceptions and Experiences of Healthcare Providers and Patients Towards Digital Health Services in Primary Health Care: A Cross-Sectional Study

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Kumaragurubaran P [1], Trupti Bodhare [2], Samir Bele [3], Vijaya Ramanathan [4], Thendral Muthiah [3], Gavin Francis [3], Ramji M [3]

1. Directorate of Public Health & Preventive Medicine, Government of Tamil Nadu, District Health Office, Madurai, IND 2. Community & Family Medicine, All India Institute of Medical Sciences, Madurai, Madurai, IND 3. Community Medicine, Velammal Medical College Hospital and Research Institute, Madurai, IND 4. Anatomy, All India Institute of Medical Sciences, Madurai, Madurai, IND

Corresponding author: Samir Bele, belesamir@gmail.com

Abstract

Background: Digital health has the potential to help achieve the Sustainable Development Goals (SDGs) by supporting health systems and enhancing health promotion and disease prevention. However, obstacles such as restricted internet access, inadequate technical assistance, clinical resource disparity, and insufficient user training can impede the utilization and growth of digital health. Researchers should examine healthcare providers' and patients' perspectives to identify challenges and enhance usability.

Methodology: The study was conducted among women health volunteers, staff nurses, and patients who used the VinCense mobile application (MedIoTek Health Systems Private Limited, Chennai, India) to record vital signs. A semi-structured questionnaire was used to evaluate participants' sociodemographic characteristics, perception of digital health monitoring, and patients' attitudes toward digital health monitoring devices. The data were analyzed using R programming, Version 4.3.3 (www.r-project.org). A multinomial logistic regression analysis was used to examine the association between sociodemographic characteristics and attitudes of patients toward digital health monitoring.

Results: The study involved 27 healthcare providers and 406 patients. The majority (66.6%) of healthcare providers found the device convenient and efficient. Around 74.1% faced technical difficulties like internet connectivity and device battery issues. Among patients, 79.8% were satisfied with their digital health monitoring experience, 86.2% found device usage comfortable and 78.1% expressed satisfaction with health education and feedback. Around 354 (87.2%) patients stated that technology has improved healthcare, and 326 (80.3%) said that health technologies have improved ease. The results indicate that female gender (p=0.00), age above 50 years (p=0.04), and occupation status as a semiskilled worker (p=0.03), skilled worker (p=0.00), and clerical/shop/farmer (p=0.01) were statistically significant and associated with the positive attitude for digital health monitoring.

Conclusions: The digital health monitoring experience was found satisfactory by both patients and healthcare providers. The mobile health (mHealth) has tremendous potential for enhancing patient health. Therefore, it is advisable to contemplate an expansion of the VinCense mHealth Platform and other digital solutions to improve service delivery in primary healthcare setups.

Categories: Public Health, Epidemiology/Public Health, Healthcare Technology
Keywords: primary health care, digital health, mhealth, patients, women health volunteers, healthcare providers

Introduction

India's public health system faces multiple challenges. These challenges include inadequate infrastructure and manpower, urban-rural inequities, restricted health insurance coverage, and insufficient public healthcare budget. Non-communicable diseases (NCD) and maternal and child mortality are threatening India's healthcare system [1]. The country has experienced a rise in non-communicable diseases over the past decade, attributing to an estimated 4.7 million deaths accounting for 49% of all-cause mortality [2].

On comparing the data sets of the National Family Health Survey (NFHS-4), the NFHS-5 shows a dramatic rise in the prevalence of hypertension among men and women, increasing from 15% and 11% to 24% and 21%, respectively. In the same way, the percentage of women who reported blood glucose levels above 140 mg/dl has risen from 5.8% to 12%. These illnesses result in a substantial demand for healthcare services and can be expensive, especially in regions with scarce resources. Additionally, the findings demonstrate the importance of reducing newborn and child mortality by strengthening primary health care [3].

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
Velammal Village
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009

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REVIEW ARTICLE

Immunity, Inflammation and Disease Open Access WILEY

COVID-19 in patients with Down syndrome: A systematic review

Praveen N. K. Pitchan Velammal[1] | **Suryakumar Balasubramanian**[2] | **Fathima Shehnaz Ayoobkhan**[1] | **Gautham V. K. Mohan**[1] | **Pearl Aggarwal**[3] | **Ali A. Rabaan**[4,5,6] | **Syed A. Khan**[7] | **Farah Yasmin**[8] | **Thoyaja Koritala**[7] | **Salim R. Surani**[9,10]

[1]Department of Medicine, Tirunelveli Medical College and Hospital, Tirunelveli, India

[2]Department of Medicine, Velammal Medical College Hospital and Research Institute, Madurai, India

[3]Department of Medicine, St Vincent Charity Medical Center, Cleveland, Ohio, USA

[4]Department of Medicine, Johns Hopkins Aramco Healthcare, Dhahran, Saudi Arabia

[5]Department of Medicine, Alfaisal University, Riyadh, Saudi Arabia

[6]Department of Medicine, The University of Haripur, Haripur, Pakistan

[7]Critical Care Medicine, Mayo Clinic Health System, Mankato, Minnesota, USA

[8]Department of Medicine, Yale University School of Medicine, New Haven, Connecticut, USA

[9]Department of Medicine & Pharmacology, Texas A&M University, College Station, Texas, USA

[10]Department of Medicine & Pharmacology, Research Collaborator, Mayo Clinic, Rochester, Minnesota, USA

Correspondence
Thoyaja Koritala, MD, Division of Hospital Internal Medicine, Mayo Clinic Health System—Southwest Minnesota Region, 1025 Marsh St, Mankato, MN 56001, USA.
Email: drkoritala@gmail.com

Abstract

Introduction: Down syndrome (DS) is associated with multiple comorbid conditions and chronic immune dysfunction. Persons with DS who contract COVID-19 are at high risk for complications and have a poor prognosis. We aimed to study the clinical symptoms, laboratory and biochemical profiles, radiologic findings, treatment, and outcomes of patients with DS and COVID-19.

Method: We systematically searched PubMed, MEDLINE, Web of Science, Scopus, and the Cochrane Library using the keywords COVID-19 or coronavirus or SARS-CoV-2 and DS or trisomy 21. Seventeen articles were identified: eight case reports and nine case series published from December 2019 through March 2022, with a total of 55 cases.

Results: Patients averaged 24.8 years (26 days to 60 years); 29 of the patients were male. The most common symptoms were fever, dyspnea, and cough. Gastrointestinal and upper respiratory tract symptoms were commonly reported for pediatric patients. The most common comorbidities present in patients with DS were obesity (49.0%), hypothyroidism (21.6%) and obstructive sleep apnea (15.6%). The patients were hospitalized for a mean of 14.8 days. When the patients were compared with the general COVID-19 population, the mean number of hospitalized days was higher. Most patients had leukopenia, lymphopenia, and elevated inflammatory markers (D-dimer and C-reactive protein). Bilateral infiltrations and bilateral ground-glass opacifications were frequently seen in chest radiographs and chest computed tomographic imaging. Most of the patients were treated with methylprednisolone, macrolides, and hydroxychloroquine. Of the 55 patients, 22 died. The mean age of the patients who died was 42.8 years. Mortality rate was higher in individuals with DS over 40 years of age.

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Prof. T. THIRUVENGADAM, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road,
Anuppanadi, Madurai-625 009.

Extrafacial Rosacea—A Diagnostic Challenge

Dear Editor,

A 40-year-old male, who is a driver, presented to our department with erythematous skin lesions over both the arms for the past 10 months. The lesions were occasionally pruritic and exacerbated during summer. There were no co-morbidities. Personal history was unremarkable. He had taken multiple treatments, both topical and oral, without appreciable improvement. The nature of drug therapy was not known.

On examination, there was multiple skin colored to reddish follicular and non-follicular papules with erythematous background distributed symmetrically over the outer aspect of both arms [Figure 1a and b]. No lesions were observed on the face or elsewhere on the body. Clinically, miliaria rubra, irritant contact dermatitis, and acneform eruptions were considered as the differential diagnoses. Dermoscopy revealed linear and arborizing vessels along with the opening of Demodex tails [Figure 2].

The squeezed follicular content under the microscope showed numerous *Demodex folliculorum* [Figure 3]. Biopsy of the lesion revealed perifollicular and peri eccrine lymphoplasmacytic infiltration along with non-caseating granulomas composed of histiocytes and occasional multinucleated giant cells in the upper dermis [Figure 4a and b]. Based on clinicopathological correlation, a final diagnosis of extrafacial rosacea was entertained. The patient was started on doxycycline 100 mg twice daily with topical metronidazole gel application and ivermectin 12 mg once a week for 2 weeks. The lesions resolved completely within a short period of 3 weeks. Follow-up at 2 months did not show any recurrence.

Rosacea is a common skin disorder which commonly affects young women and primarily involves the facial convexity affecting the nose, cheeks, chin, forehead, and glabella, with typical sparing of the periocular and perioral regions. The four subtypes of rosacea are (i) erythematotelangiectatic rosacea, (ii) papulopustular rosacea, (iii) phymatous rosacea, and (iv) ocular rosacea.

The rare variants are granulomatous rosacea, which manifests as erythematous and monomorphic papules with periorificial location, and rosacea fulminans, characterized by sudden eruption of cystic nodules, papules, and pustules over the chin, cheeks, and forehead.

The term "extrafacial rosacea" was described in the year 1967 by Fountain and Sarkany, in a patient with findings of typical rosacea affecting the face and neck along with papules on the arm and the wrist.[1]

Later, similar cases of 14 patients were reported by Marks and Jones in 1969.[2]

The extra facial lesions of rosacea clinically present with multiple, discrete, papules, or nodules similar to facial lesions. Papulonecrotic lesions have also been described in the literature.[3] These lesions are often accompanied by facial rosacea and occur at scalp, ear, neck, axilla, upper extremities, pre-sternal area, and abdominal region. The clinical diagnosis will be more difficult, and often misdiagnosed in the scenario of absent facial lesions. Majority of such lesions have granulomatous pathology in the histopathology.

Extra facial rosacea predominantly affects men.[4] The exact pathogenesis is unknown, although disseminated infestation

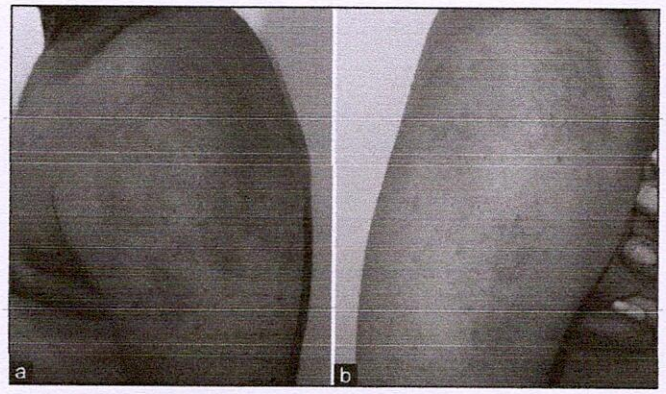


Figure 1: (a and b) Clinical image showing multiple skin colored to reddish follicular and non-follicular papules with erythematous background over the outer aspect of both arms

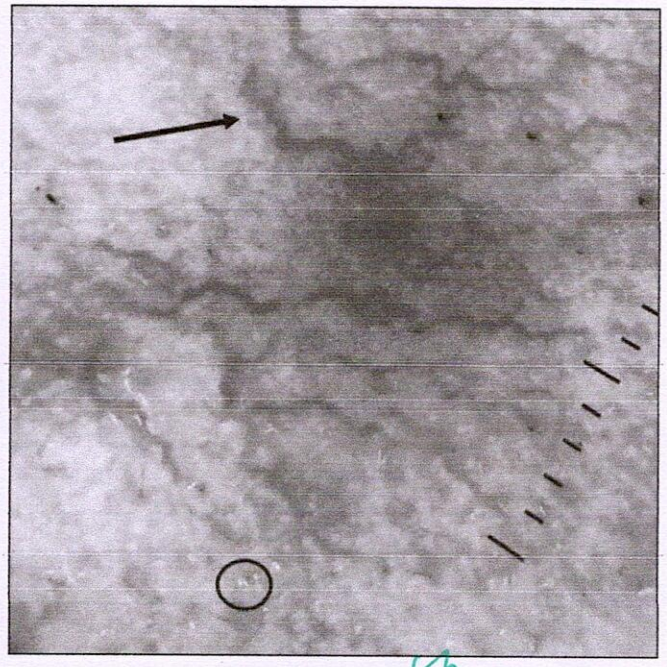


Figure 2: Dermoscopy shows linear and arborizing vessels (black arrow) and Demodex tails (Black circle) (Dermalite 4, 10x magnification)

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Prof. T. THIRUNAVUKKARASU, M.S., M.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, TN.

Coexisting primary and secondary syphilis in an immunocompetent individual

Sir,

Syphilis is an ancient and well-known sexually transmitted disease, caused by *Treponema pallidum*, and the prevalence rate has been in the increasing trend nowadays. It passes through 4 phases through primary, secondary, latent, and tertiary stages. The primary stage which occurs after an incubation period of 9–90 days is an inoculation of treponemal spirochetes at the site of breach in the genital or extragenital skin and mucosa. After a period of 6–8 weeks, it manifests with diverse mucocutaneous lesions ranging from macular, papular, papulosquamous to pustular lesions.

A 32-year-old promiscuous male presented to our outpatient department with multiple ulcers over the scrotal region for the past 2 months. He was bisexually oriented and had multiple female and male partners. The last sexual act was unprotected with a male, 2 weeks back. He was a passive partner and admitted the practice of coitus interfemoris also.

On examination, there were multiple, painless, hard, and indurated ulcers of varying sizes over the scrotum and ventral aspect of the penis [Figure 1]. There was a single nonindurated ulcer of size 0.5 cm × 0.5 cm in the left side of the scrotum [Figure 2]. There was an annular plaque of size 3 cm × 3 cm among these ulcers in the right side of the scrotum [Figure 3]. There was bilateral, painless, and firm inguinal lymphadenopathy. Cervical and axillary nodes were also palpable. Other areas including the oral cavity, anal and perianal areas, palms, and soles were normal.

Dark field microscopy was done from the exudate over the indurated and nonindurated ulcers and *T. pallidum* was demonstrated. Grams stain and Tzanck smears were negative. The rapid plasma reagin was reactive in 1:256 dilution and confirmed by treponema pallidum hemagglutination which also turned to be reactive. Serology for herpes simplex virus and human immunodeficiency virus 1 and 2 statuses were nonreactive.

A final diagnosis of annular syphilide with persistent chancre and chancriform ulcer of secondary syphilis was made and the patient was treated with a single dose of injection benzathine penicillin 2.4 million units and he was under regular follow-up. Partner tracing could not be done as there were multiple partners. The patient returned after 1 month and all lesions had completely resolved.

Syphilitic chancre signifies the local tissue reaction and the regional lymph nodes become enlarged within a week of the appearance of the chancre. In 40% of individuals, multiple chancre can occur due to autoinoculation.[1-3] This could be a reason for multiple chancres in the scrotum as seen in our case. It has an indolent course and heals spontaneously, if untreated, within 3 to 10 weeks leaving a thin and atrophic scar.

The interval between the appearance of chancre and the onset of secondary manifestations is highly variable and ranges from 6 to 8 weeks. In about a third of the cases, chancre can still persists.[4] However, only few cases of co-occurrence of the primary and the secondary syphilis

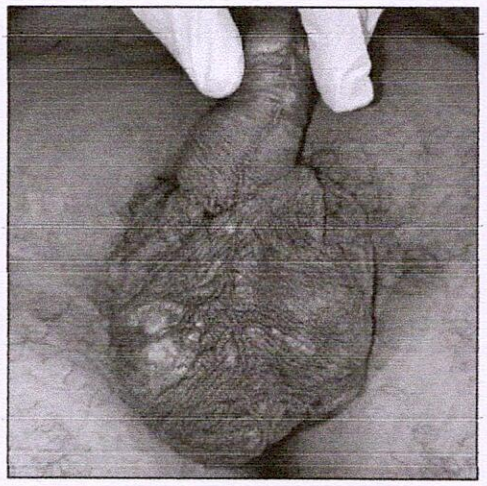


Figure 1: Multiple, painless, hard, and indurated ulcers of varying sizes over the scrotum and ventral aspect of the penis



Figure 2: Chancriform ulcer seen at the left side of the scrotum

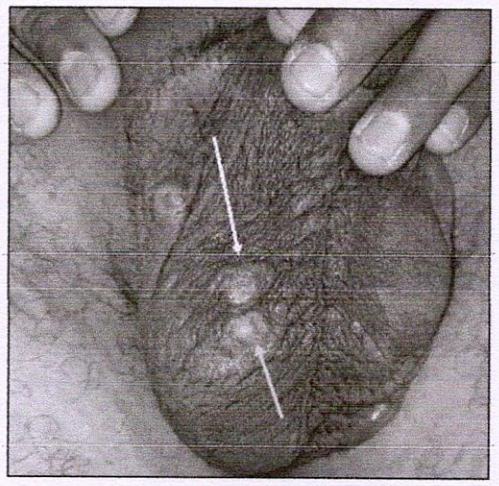


Figure 3: Annular syphilide (white arrow) and few chancres seen within the annular plaque (yellow arrow) in the scrotum

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Prof. P. THINGNAVELRAJAN, M.D.S.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009.

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Sino-Orbital IgG4 Related Disease- An Uncommon Entity

Pookamala Sathasivam [1], Subramanian Nallasivan [2], Ramapriyadharshini [3], Jegan C [4], Vishnu [5]

Affiliations

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DOI: 10.1007/s12070-024-04669-w

Abstract

IgG4 related disease (IgG4-RD) is an auto immune fibro-inflammatory condition, characterised by presence of IgG4 positive lymphoplasmacytic infiltrates and extensive fibrosis of the involved organ. It commonly affects pancreas, biliary tract and salivary glands. Sino-orbital involvement is a relatively rare presentation. There is extensive fibrosis of the involved organ. Biopsy is often diagnostic and it shows extensive necrosis and lymphoplasmocytic infiltrates. They show dramatic response to steroid therapy. Here we present three cases of IgG4-RD disease involving orbit and para nasal sinuses who were evaluated and treated in a tertiary care teaching hospital over a period of 2 years.

Keywords: IgG4 related disease; Orbital apex syndrome; Orbital pseudo tumour; Proptosis; Sino-orbital IgG4 disease.

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625

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Autonomic Imbalance and Elevated Inflammatory Cytokines in Long COVID: A Cross-Sectional Study

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Lakshmi Jatiya [1], Jothi Marie Feula [2], Latha R [3], Vidhyalakshmi R [4], James Rajesh [5]

1. Department of Physiology, Aarupadai Veedu Medical College and Hospital, Vinayaka Mission's Research Foundation (VMRF), Puducherry, IND 2. Department of Physiology, All India Institute of Medical Sciences Madurai, Madurai, IND 3. Department of Microbiology, Aarupadai Veedu Medical College and Hospital, Vinayaka Mission's Research Foundation (VMRF), Puducherry, IND 4. Department of Physiology, Chettinad Medical College and Hospital, Chennai, IND 5. Forensic Medicine and Toxicology, Velammal Medical College Hospital and Research Institute, Madurai, IND

Corresponding author: Jothi Marie Feula, dr.feula@gmail.com

Abstract

Introduction: Following an infection with SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19), many individuals fully recover. On the other hand, a few have symptoms that last for weeks, months, or even years after their initial diagnosis. Symptoms of COVID-19 persisting for four weeks and more are termed long COVID.

Aim: To assess the long-term cardiovascular morbidity by battery of cardiac autonomic function tests as well as the persistence of inflammation in COVID-recovered patients three months after initial infection.

Methodology: 150 patients were selected who had recovered from COVID-19 at least three months prior to the study. After obtaining informed written consent, a throat swab was tested for COVID-19, and those with negative reverse transcription polymerase chain reaction (RT-PCR) results were subjected to autonomic function testing. Serum interleukin-6 and C-reactive protein levels were determined by enzyme-linked immunosorbent assay (ELISA) test.

Results: Out of 150 subjects 36 were found to have autonomic dysfunction graded according to Ewing's criteria. Individuals with autonomic dysfunction also had significantly increased inflammatory biomarker levels. There was also significant correlation between inflammatory markers and autonomic function test and heart rate variability parameters.

Conclusion: Even years after the COVID-19 pandemic was declared, new symptom patterns and syndromes such as 'long COVID' are appearing. A better understanding of the pathophysiological mechanisms of post-COVID manifestations that affect the autonomic nervous system, as well as customized therapeutic care, should help reduce COVID-19 sequelae, particularly if we act early in the disease.

Categories: Other, Infectious Disease
Keywords: autonomic imbalance, interleukin – 6, long haul covid, post covid syndrome, chronic covid, long covid

Introduction

The coronavirus disease 2019 (COVID-19) pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has had a devastating impact on the global population's health and economy. More than 430 million confirmed cases of COVID-19 and more than 5.9 million deaths had been reported to the World Health Organization (WHO) by February 2022 [1]. Around 80% of COVID-19 patients suffer from mild illness and recover in two to four weeks. Approximately 20% of patients end up with moderate and severe forms of illness and are hospitalised. The course of the disease is determined by proinflammatory cytokines such as interleukin-6 (IL-6) and C-reactive protein (CRP), as well as the existence of co-morbidities such as cardiovascular, respiratory, metabolic, and cancer. The question that emerges is what pathological similarities these disorders share. The reality is that all of these illnesses have an autonomic imbalance characterized by parasympathetic withdrawal and sympathetic overactivity [2].

Acute COVID is defined as signs and symptoms of COVID that last for less than four weeks. Ongoing symptomatic COVID is defined as signs and symptoms that persist after four weeks and up to 12 weeks of initial infection. Post-COVID syndrome is defined as symptoms that persist for more than 12 weeks after ruling out reinfection. Prolonged COVID, also known as Long COVID, refers to both ongoing symptomatic COVID and chronic COVID [1]. Post-COVID symptoms are quite diverse, affecting and involving several systems. Numerous pathophysiological mechanisms like direct or indirect invasion of virus, immune dysregulation of the immune system, hormonal disruptions, elevated cytokine levels as a result of immune response leading to chronic inflammation, direct tissue damage, and persistent low-grade infection have

Dean
Velammal Medical College Hospital
and Research Institute
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625

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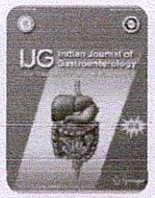
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Home Indian Journal of Gastroenterology Article

Clinical profile of 1208 newly diagnosed colorectal cancer patients in Tamil Nadu—A multi-centric survey

Original Article Published: 19 February 2024

Volume 43, pages 660–667, (2024) Cite this article



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Aims and scope

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Abstract

Background

An increasing incidence of colorectal cancer (CRC) is being reported in developing countries, including India. Most Indian studies on CRC are retrospective and single-centered. The present study is an attempt to understand the current clinical profile and

Velammal Medical College Hospital
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

stage of newly diagnosed CRCs across multiple centers in Tamil Nadu, India.

Methods

A multi-centric observational survey was conducted between September 1, 2021, and August 31, 2022, under the aegis of the Indian Society of Gastroenterology - Tamil Nadu chapter. Patients 18 years of age and older with a recent diagnosis of CRC fulfilling the inclusion criteria were prospectively recruited at the participating centers. Their demographic, clinical, biochemical, endoscopic, histopathologic, radiologic and risk factor details were systematically collected and analyzed.

Results

Across 23 centers in Tamil Nadu, 1208 patients were recruited. The male:female ratio was 1.49:1, while mean (SD) age was 57.7 (13.5) years. A majority (81.9%) were Tamils and 78.5% belonged to lower socioeconomic classes. The predominant symptoms were hematochezia (30.2%) and a change in bowel habits (27.5%). The most common locations were the rectum (34.3%) and rectosigmoid (15.1%). Synchronous CRCs were seen in 3.3% and synchronous colorectal polyps in 12.8%. Predisposing factors for CRC were seen in 2%. A past history of any cancer among CRC patients was obtained in 3.1% and a family history of any cancer was found in 7.6%. Patients who were either overweight or obese constituted 46.4% of the study population. At presentation, the predominant stages were stage III (44.7%) and stage IV (20.8%).

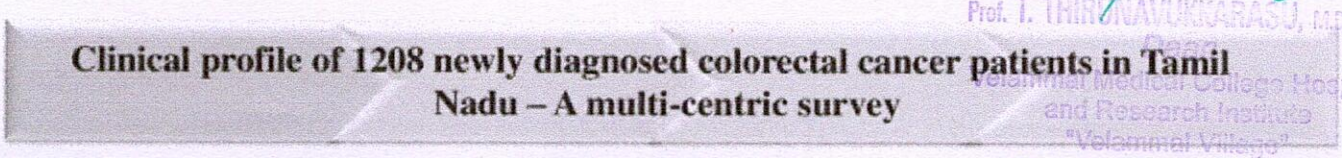
Conclusions

A majority of patients with newly diagnosed CRC in Tamil Nadu belonged to the lower socioeconomic classes. About 60% had CRCs located within the reach of the flexible sigmoidoscope. Two-thirds of the patients exceeded stage II disease at presentation.

Trial registration

Not applicable

Graphical Abstract



Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009.

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Awareness, Perception, and Practice Regarding Needle-Stick Injury and Its Prevention Among Healthcare Workers in a Tertiary Care Hospital in Southern India

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D. Anandadurai [1], R. Praisie [1], Sriandaal Venkateshvaran [2], Sudhir B. Nelson [2], Manoje Thulasiram [1]

1. General Medicine, Velammal Medical College Hospital & Research Institute, Madurai, IND 2. Community Medicine, Velammal Medical College Hospital & Research Institute, Madurai, IND

Corresponding author: Sudhir B. Nelson, sudhirben@gmail.com

Abstract

Background

Needle stick injuries caused by various sharp and other items like hypodermic needles and intravenous cannulas are important occupational hazards for healthcare workers (HCW). Preventing injuries is the most effective way to protect workers and requires good awareness and perceptions associated with practice on a daily basis. Therefore, we did a descriptive cross-sectional study involving healthcare workers in a tertiary care hospital to find the level of awareness, perception, and practice associated with needle stick injury and its prevention.

Methodology

A descriptive cross-sectional study was conducted in a tertiary care hospital, in south India. 400 healthcare workers (doctors, nurses, technicians, and housekeeping staff) with more than one year of experience were randomly selected. An anonymous, self-reporting, semi-structured questionnaire was administered. Results are expressed in mean, standard deviation, frequency, and percentages.

Results

Out of 400 respondents, 89% had good awareness about proper disposal practices. However,44% of the participants had the misbelief that recapping needles was recommended to prevent needle stick injury (NSI), and 30.5% practiced it, with the doctors being the majority. The majority (79.8%) knew that HIV, Hepatitis B & C are blood-borne pathogens that HCWs are most commonly exposed to through needle-stick injury (NSI). However, only 49% knew that Hepatitis B has the highest risk of transmission following a needle prick. 75% were aware of the correct Hepatitis B vaccination doses. Most of the healthcare workers (89.5%) claimed to be aware of the procedure and guidelines to be followed after a needle stick injury and 96% felt that they would report NSI immediately. Awareness regarding Hepatitis C prevention was comparatively poor, with only 47% having knowledge regarding the non-availability of Hepatitis C Vaccination and& 46% about the non-availability of post-exposure prophylaxis for Hepatitis C. Among the healthcare workers, 61% were worried about having needle stick injuries but 56.5% felt that their own personal safety is secondary to patient care. Among the HCWs, 91.3% believed that needle stick injuries can be prevented. Most of the participants (93.5%) ensure that others around them take extra precautions while handling sharp/ needles. The majority, i.e. 88%, utilized a designated container for disposal of sharp items, while only 53% of respondents utilized a needle cutter or shredder. 85% of HCWs had attended specific training programs on the usage of safe devices/sharps in the preceding one-year period and 72.8% had completed the vaccination against Hepatitis B.

Conclusion

Awareness regarding needle stick injury and its prevention is patchy and not adequate across different sections of healthcare workers. Perceptions regarding needle stick injury and its prevention revealed an overall positive attitude. Practices related to needle stick injury and its prevention seem to be reasonably good except when related to recapping and waiting to dispose of until the completion of the session. Training sessions need to be tailored for specific participant groups and a 'one size fits all' philosophy cannot be followed.

Categories: Family/General Practice, Preventive Medicine, Occupational Health
Keywords: recapping of needles, prevention, hiv, post exposure prophylaxis, hepatitis c, hepatitis b, healthcare workers, blood borne diseases, needle stick injury

Introduction

Prof. T. THIRUNAVUKKARASU,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Anuppanadi, Maddrai-625 009, T.N.

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A Hospital-Based Longitudinal Study of Rubber Band Ligation and Sclerotherapy Treatment for Internal Hemorrhoids From South India

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Samrobinson J [1], Jeyaganesh R [2], Geetha Arumugam [3], Nawin J. Vignesh [3]

1. General Surgery, Vels Medical College and Hospital, Tiruvallur, IND 2. General Surgery, Velammal Medical College and Hospital, Madurai, IND 3. Community Medicine, Karpagam Faculty of Medical Sciences and Research, Coimbatore, IND

Corresponding author: Nawin J. Vignesh, nawinvignesh1995@gmail.com

Abstract

Background

Hemorrhoids are an extremely common surgical condition affecting millions of individuals worldwide. Treatment options for hemorrhoids vary depending on the severity of symptoms and the type of hemorrhoids. The common non-surgical procedures for grade one and two hemorrhoids include rubber band ligation and sclerotherapy. The present study aims to compare the efficiency of rubber band ligation and sclerotherapy for the treatment of symptomatic grade one and two internal hemorrhoids in a tertiary care hospital.

Methodology

We conducted a one-year longitudinal survey among 200 patients with internal hemorrhoids in a tertiary care center in Madurai. We gathered data on demographic profiles, symptoms, postoperative complications, intraoperative pain, and treatment outcomes. Data analysis was done using the Pearson chi-square test to assess the difference between rubber band ligation and sclerotherapy treatment groups. A p-value <0.05 was considered statistically significant.

Results

A total of 200 patients were studied, of whom 100 belonged to the rubber band ligation treatment group and 100 belonged to the sclerotherapy treatment group. The preoperative symptoms were similarly distributed between both treatment groups. Intraoperative and immediate postoperative pain was higher in the rubber band ligation group than in the sclerotherapy group. Post-procedure complications were more commonly seen in the rubber band ligation group than in the sclerotherapy group at various weeks of the procedures.

Conclusions

Postoperative complications such as bleeding, prolapse, and infection/discharge were significantly different between the two treatment groups. The treatment outcome was significantly different between the two treatment groups after three, six, and nine weeks postoperatively. Overall, the sclerotherapy group was associated with fewer postoperative complications, more excellent patient response, and a more complete response to treatment than the rubber band ligation group.

Categories: General Surgery
Keywords: piles, endovenous chemical ablation, sclerotherapy, banding, hemorrhoids

Introduction

Hemorrhoids, though commonly misunderstood or overlooked, are an extremely common surgical condition affecting millions of individuals worldwide. These swollen and inflamed veins in the rectum and anus can cause discomfort, pain, and even bleeding, significantly impacting one's quality of life. Despite their prevalence, discussing hemorrhoids can often be met with discomfort or embarrassment, leading many to suffer in silence without seeking proper medical attention.

The estimates of hemorrhoids by various studies suggest that they affect a significant proportion of the Indian population. According to Safir et al., approximately one in every four people over the age of 30 suffers from hemorrhoids [1]. Several studies have observed similar prevalence rates in Western and Indian studies [2-4].

Treatment options for hemorrhoids vary depending on the severity of symptoms and the type of hemorrhoids. Some treatment options include home remedies, medication, non-surgical procedures, and

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Anuppanadi, Madurai-625 009, T.N.

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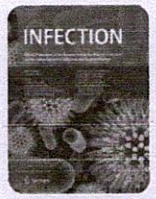
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Home Infection Article

Cerebral phaeohyphomycosis due to *Cladophialophora bantiana*: case report and systematic review of cases

Review Published: 18 November 2023

Volume 52, pages 313–321, (2024) Cite this article



Infection

Aims and scope

Submit manuscript

Vithiya Ganesan, Vinaykumar Hallur, S. Velvizhi & T. Rajendran

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Abstract

Purpose

Cladophialophora bantiana is a wonted melanized fungus causing brain abscess. In past many cases were reported from Asia, particularly from India. Of late, there is a rise in cases in places besides Asia and hence a review of the cases is warranted.

Methods

We present a case of fatal cerebral phaeohyphomycosis caused by *C. bantiana* and conduct a systematic review of culture confirmed brain abscess due to *C. bantiana* reported between 2015 and 2022.

3.30 mm

Prof. T. THIRUNAVUKKARASU, M.D., D.M.,
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 [illegible] N.

Results

Of the 39 cases found, majority (68%) were immunocompromised. The various clinical presentations were headache (53%), hemiparesis (34%), visual disturbance (25%), altered sensorium (18%), aphasia/dysarthria (12%) and seizures (9%). Isolated lesion was observed in 18 (60%) patients. In the sequence of occurrence, the lesions were in frontal (30%), temporal (27%) and parietal (20%) region. There were five cases with coinfections such as concurrent detection of *Nocardia* pneumonia in two cases, toxoplasma DNA in brain abscess, coexisting pulmonary *Cryptococcus neoformans* infection and coexisting *Candida* in a case of brain abscess in one case each. Surgical intervention was performed in 84% cases. Antifungal therapy included voriconazole (80%), liposomal amphotericin B (76%), 5-fluorocytosine (30%), posaconazole (10%), and amphotericin B deoxycholate (6%). The overall mortality was 50% with lower mortality (42%) in regions outside Asia compared to Asia (63.6%) though not statistically significant.

Conclusions

C. bantiana brain abscess is an emerging infection worldwide. Next generation sequencing is an upcoming promising diagnostic test. Early complete excision of the lesion with effective antifungals may improve the outcome.

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Velammal Medical College Hospital
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"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 0

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Case Report

Non O1 non O139 *Vibrio cholerae* septicemia in a patient with carcinoma pancreas-a case report and literature review, 2020–2023

G. Vithiya [a], S. Velvizhi [a], P. Shunmuga Sundaram [b], Jharna Mandal [c]

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Abstract

Non-O1/non-O139 Vibrio cholerae, a comparably poorly studied pathogen is culpable of sporadic but serious infections. We report a case of non O1 non O139 Vibrio cholerae septicemia in a middle aged male recently diagnosed with carcinoma pancreas. He underwent biliary tract interventional procedure for hematemesis three weeks before the presentation. Now, he presented with fever, abdominal pain, hematemesis and melena. Endoscopy revealed severe portal hypertensive gastropathy and mild hemobilia. Blood culture grew *Vibrio cholerae*, identified as non O1 non O139 by serogrouping. He recovered successfully with timely diagnosis, appropriate antibiotics and supportive measures.

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
Madural-Tuticorin Ring Road
Anuppanadi, Madural-625 009, T.N.

Introduction

Non-O1/non-O139 *Vibrio cholerae* (NOVC) are a comparably poorly studied pathogen,

Iranian Journal of Microbiology
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SHORT COMMUNICATION

Extra-intestinal salmonellosis in a tertiary care centre in South India

Vithiya Ganesan[1], Shyamala Ravikoti[2], Raja Sundaramurthy[2*], Monica Raghavan[3], Rajendran Tiruvanamalai[1]

[1]Department of Microbiology, Velammal Medical College Hospital and Research Institute (VMCH&RI), Madurai, Tamilnadu, India

[2]Department of Microbiology, All India Institute of Medical Sciences (AIIMS), Bibinagar, Hyderabad, Telangana, India

[3]SRM Medical College Hospital and Research Centre, Chengalpattu, Tamilnadu, India

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ABSTRACT

Background and Objectives: Extra-intestinal salmonellosis is associated with higher case fatality and is underestimated in the developing countries like India. Here we present a case series of bacteriologically proven extra-intestinal salmonellosis managed at our institute over the past two years.

Materials and Methods: Retrospective analysis of bacteriologically proven extra-intestinal salmonellosis over two years between January 2020 to December 2021 was carried out. Medical records were reviewed for site of infection, evidence of any underlying or predisposing illnesses and antimicrobial susceptibility report.

Results: Eight patients were diagnosed with extra-intestinal salmonellosis. Male to female ratio was 3:1. Mean age was 44 years. Four were typhoidal and four were nontyphoidal Salmonellae. The extra-intestinal sites involved were purulent aspirates from scrotum, caecum, perianal region, intraperitoneal collection, synovium, and urine. Predisposing factors include chronic myeloid leukemia, HIV and gastric malignancy. All deep seated abscess required surgical intervention. All typhoidal *Salmonella* (n=4) were sensitive to cotrimoxazole, ampicillin, ceftriaxone. Among nontyphoidal *Salmonella*, one was resistant to cotrimoxazole; two were resistant to ampicillin, ceftriaxone and three resistant to ciprofloxacin.

Conclusion: The diagnosis of extra-intestinal salmonellosis requires a high degree of clinical suspicion and should be included in the differential diagnosis in patients with deep-seated abscesses.

Keywords: Salmonellosis; *Salmonella enteritidis*; Abscess; Pancreatitis

INTRODUCTION

The clinical significance of extra-intestinal manifestations of *Salmonella* is not often appreciated. There are very few documented reports on the actual prevalence of these infections, especially from an endemic region such as India (1, 2). Invasive non-typhoidal salmonella are clinically indistinguishable from other febrile illnesses with higher case fatality (3). Here we present a case series of eight cases of bacteriologically proven extra-intestinal salmonellosis managed at our institute over the past two years.

MATERIALS AND METHODS

The microbiology laboratory records of the extra-intestinal specimens that were culture-positive for *Salmonella*, between January 2020 and December 2021 were included in this retrospective study. The

*Corresponding author: Raja Sundaramurthy, MD, Department of Microbiology, All India Institute of Medical Sciences (AIIMS), Bibinagar, Hyderabad, Telangana, India. Tel: +91-9791304297 Email: rajacmc87@gmail.com

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Original Research Article

Ceftazidime-Avibactam resistance in clinical isolates of carbapenem-resistant *Klebsiella pneumoniae*: A phenotypic and genotypic analysis

Varshini M. Krithika, Vithiya Ganesan, T. Rajendran

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Abstract

Objective

To find the prevalence of Ceftazidime-Avibactam (CAZ-AVI) resistant Klebsiella pneumoniae in clinical isolates and to determine the genes responsible for Ceftazidime-Avibactam resistance using PCR.

Methods

A total of 89 carbapenem resistant *Klebsiella pneumoniae* from various clinical samples were included in the study. CAZ-AVI resistance was tested using E-test. CAZ-AVI resistant strains were subjected to conventional PCR for detection of carbapenamase genes bla_{NDM-1}, bla_{OXA-48}, bla_{VIM}, bla_{IMP}, bla_{KPC}.

Results

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madural-Tuticorin Ring Road
Anuppanadi, Madural-625 009 T.N.

Detection of Chlamydial Heat Shock Protein 60 and 10 Antibody among Female Infertility

Gopi Dhivya, Kopula Sathyamoorthy Sridharan[1], Sanjeeva Reddy Nellepalli[2], P. Kennedy Kumar, Arunagiri Ramesh[3], Divya Katta

Departments of Microbiology, [1]Laboratory Medicine and [2]Reproductive Medicine and Surgery, Sri Ramachandra Medical College and Research Institute, SRIHER, Chennai, [3]Department of Microbiology, Velammal Medical College Hospital and RI, Madurai, Tamil Nadu, India

Abstract

Introduction: Of the many sexually transmitted pathogens, *Chlamydia trachomatis* is increasingly being associated with long-term sequelae such as infertility, apart from causing genital tract infections. Many inflammatory responses directed against chlamydial infection can cause tubal damage resulting in infertility. For example, chlamydial heat shock protein 60 (cHSP60) and cHSP10 along with humoral immune response. The aim of our study is to detect the presence of immunoglobulin G (IgG) antibodies against Major Outer Membrane Protein (MOMP), cHSP60, and cHSP10 among female infertility. **Methods:** A total number of 230 female infertility patients attending the Outpatient Department of Reproductive Medicine, SRIHER, were included in the study. Detailed history documented in the proforma. Serological detection of *C. trachomatis* IgG antibody against MOMP, cHSP60, and cHSP10 antibody was done by enzyme-linked immunosorbent assay (ELISA). **Results:** *C. trachomatis* IgG antibody against MOMP was detected in 15 (6.5%) of 230 females. High seropositivity to cHSP60 antibodies was detected among females of tubal factor infertility (TFI). Our study showed that cHSP60 antibodies (3.4%) were more common than cHSP10 (2.6%). **Conclusion:** Our study suggest cHSP60 or cHSP10 antibody detection by ELISA along with TFI is helpful for diagnosis and early institution of therapy. The accuracy of TFI prediction could be increased by the detection of anti-MOMP and cHSP60 over cHSP10 among secondary infertility than primary. The most probable reason for high seropositivity among secondary infertility patients may be due to repeated infection and chronicity because of longer active sexual life.

Keywords: *Chlamydia trachomatis,* enzyme-linked immunosorbent assay, heat shock protein, tubal factor infertility

Introduction

Globally, *Chlamydia trachomatis* infection (CTI) is the most common bacterial sexually transmitted disease, with over 130 million new instances being reported every year.[1] Of the sexually active age groups of the general population, around 10 million cases of asymptomatic genital chlamydial infection have been recorded in India.[2] The literature demonstrated that about 23.3%–33% of cases of *C. trachomatis* were found in India.[2,3] Over 80% of these individuals remain asymptomatic and may therefore remain undiagnosed. A persistent infection with *C. trachomatis* can spread to the upper genital tract and resulting pelvic inflammatory disease (PID). If left untreated this might result in long-term sequelae like infertility.[4] Infertility is defined as failure to conceive following a year of regular unprotected sexual intercourse. It can be categorized as primary and secondary. Couples who have never conceived are considered to be primary infertility, whereas secondary infertility is defined as a couple who are unable to conceive following a previous successful conception but not necessarily having a live birth.[5] Other than chlamydial infection, infertility can also be caused by several factors such as tubal damage (blocked tubes), ovarian disorder (polycystic ovary syndrome and other follicular disorders), uterine disorder (fibroids, septate uterus, and endometriosis), and endocrine system disorders (reproductive hormone imbalances).[6] Tubal damage or tubal factor infertility (TFI) is multifactorial, and it can be caused by bacterial infection (*Neisseria gonorrhoeae, Mycoplasma genitalium,*

Address for correspondence: Dr. Kopula Sathyamoorthy Sridharan, Department of Laboratory Medicine, Sri Ramachandra Medical College and Research Institute, SRIHER, Porur, Chennai - 600 116, Tamil Nadu, India.
E-mail: sridharan.ks@sriramachandra.edu.in

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Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Case Reports Natl Med J India. 2024 Jan-Feb;37(1):22-25. doi: 10.25259/NMJI_402_2022.

Epidemiology and clinical spectrum of melioidosis: Analysis of cases from a tertiary care centre in southern Tamil Nadu

Vithiya Ganesan [1], Raja Sundaramurthy [2]

Affiliations

PMID: 39096230 DOI: 10.25259/NMJI_402_2022

Abstract

Background We studied the clinical features and treatment outcome of patients with melioidosis in our hospital. Methods We did this retrospective observational chart review over a period of 7 years between December 2014 and February 2022. Results There were 59 cases and 23 deaths attributable to melioidosis over the study period. The age range was 5 to 74 years and 48 (81.3%) were men. The comorbid conditions included diabetes mellitus (68%), alcoholism (11.8%), pulmonary tuberculosis (6.7%) and chronic kidney disease (5%). Over three-fourths of patients (78%) presented during the rainy season (June to December) and were acute presentations (44 [75%]). The most common sites were liver and spleen, followed by the musculoskeletal system, skin, soft tissues, lungs and brain. Of the 21 (36%) patients with septic shock, 16 (76%) died. On the contrary, of 38 (64%) patients without septic shock, only 11% died. Of the 27 (47%) admitted to ICU, 11 (41%) died. In ICU, 18 (67%) were ventilated. Of the 23 (39%) deaths overall, median time from admission to death was 4 days. There were no relapses in the 42% patients followed up for 2-6 months. Conclusions The epidemiology of melioidosis is similar to other endemic areas with preponderance of men. There was a temporal association with the monsoon season and a higher number of acute cases. The differences included a higher proportion of deep visceral abscesses and musculo-skeletal involvement compared to lung involvement.

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Case Report

Mycobacterium abscessus endocarditis post cardiac cathetrisation-a case report and review of 25 cases (2001–2023)

Vithiya G [a,*], P. Shunmuga Sundaram [b]

[a] Department of Microbiology, Velammal Medical College Hospital and Research Institute, Madurai, India
[b] Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, India

ARTICLE INFO

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ABSTRACT

47 year male underwent percutaneous transluminal coronary angioplasty elsewhere, developed fever after two days, and treated empirically in various hospitals for the subsequent two months. Echocardiography showed vegetation in aortic valve and blood cultures were negative. He was then diagnosed as a case of endocarditis due to *M. abscessus* in our centre by repeated positive blood cultures. After treatment with Imipenem, Amikacin and clarithromycin in the background of pancytopenia, patient was discharged with advice to continue antibiotics and planned for aortic valve replacement. Patient was noncompliant to treatment, readmitted with worsening symptoms, developed multiorgan failure and subsequently died of infection.

1. Introduction

Mycobacterial endocarditis is rare but dreadful, and the implicated pathogens are commonly rapidly growing mycobacteria. Among them, most virulent and challenging to treat is *M. abscessus* [1,2]. We report a case of iatrogenic native valve endocarditis due to *M. abscessus* after coronary angioplasty.

2. Case report

A 47 year old male diagnosed as coronary artery disease in 2018 and managed conservatively was admitted in a local hospital on February 2023 with breathlessness, diagnosed as major diagonal branch disease and underwent Percutaneous Transluminal Coronary Angioplasty. He developed fever after two days which improved with empirical antibiotic therapy. After ten days, he developed fever with chills, cough and breathlessness. He visited a number of hospitals in a month and investigations revealed raised C Reactive Protein (35g/dL), and negative blood cultures. Echocardiography showed dilated left atrium and ventricle, mild mitral regurgitation (MR), grade II aortic regurgitation (AR) without any evidence of vegetation. Meanwhile, he received multiple courses of antibiotics including Faropenem, Levofloxacin, Ciprofloxacin and Amoxyclav. Blood cultures remained negative and repeat Echocardiography done after a month showed thickened aortic valve with vegetation of size 5.5 × 3.6 mm, severe AR and Grade II MR.

He was received in our tertiary care teaching hospital where Echocardiography showed vegetation of size 6 × 7mm attached in aortic valve, severe AR, Moderate MR, Mild Tricuspid Regurgitation, Pulmonary Artery Hypertension and left ventricular ejection fraction 34 % He developed febrile spikes on and off and blood cultures sent grew white colonies on blood agar which were Gram variable, acid fast rapidly growing non tuberculous mycobacteria identified as *M. abscessus. by* Vitek MS (bioMerieux, France, version 3.2 MALDI-TOF) [Fig. 1]. Antibiotics administered include three weeks of Imipenem 1g 8th hourly, Amikacin 750mg every 24 hours and oral Clarithromycin 500mg every 12 hours. He was discharged with advice to continue antibiotics and planned for aortic valve replacement. However, patient was noncompliant to therapy and twenty four days post discharge from our centre, he was readmitted with worsening symptoms and pancytopenia. Ensuing blood and bone marrow cultures demonstrated breakthrough *M. abscessus* bacteremia. Despite grave prognosis, due to financial constraints, patient was discharged against medical advice. After nine days, he was readmitted with decreased sensorium, hematemesis, blood stained stools and reduced urine output for two days. He was febrile (101 °F), cyanosed, BP 80/20 mmHg, SpO2 95 % at room air, Glascow coma scale score was 3, pancytopenic (Hb 5.7g/dL, TC 1610 cells/cu. mm, platelets18,000 cells/mcL), icteric (total bilirubin (6.23 mg/dL). Blood sugar (41 mg/dL), urea (265 mg/dL) and creatinine (10.5 mg/dL) were elevated. Packed cells, random donor platelets, G-CSF(Granulocyte Colony Stimulating Factor) were administered for pancytopenia.

* Corresponding author. R.S.No 45/6, plot no.20 Babu Nagar Main Road, Sourashtra Teachers' Colony, Anuppanadi, Madurai, 625009, India.
E-mail address: vidhya.md@gmail.com (V. G).

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

Clostridial Catastrophe in Orthopedics – A Case Report

Jesmick Ponniah[1], Ganesan Ram Ganesan[1], Akshara Vijayendran[1]

Learning Point of the Article:

Gas gangrene is a rare condition, and hence, recognition of these uncommon presentations and timely diagnosis with a multidisciplinary approach are crucial to prevent complications and spread of the infection.

Abstract

Introduction: We present a case of a 51-year-old gentleman admitted to the emergency department with a 2-day history of severe left forearm symptoms following a Gustillo-Anderson type II left both bone fracture sustained during a bicycle accident. Initially managed conservatively at an outside facility with an above-elbow backslab, his condition rapidly deteriorated, necessitating transfer to our institution. Adding complexity to his clinical presentation was his history of poorly controlled type 2 diabetes mellitus.

Case Report: On arrival, the patient exhibited fever and pronounced limb abnormalities, including extensive swelling, brownish skin with oozing blisters, and subcutaneous crepitus spanning from wrist to elbow. Radiological imaging unequivocally identified gas within the forearm compartments, signifying a severe infection. A provisional diagnosis of gas gangrene was made, later confirmed by culture report through intraoperative sampling.

Conclusion: Gas gangrene was definitively diagnosed, prompting immediate emergency surgery. Extensive necrosis was discovered during the procedure, necessitating an above-elbow amputation for limb salvage. Unfortunately, postoperatively, the infection continued to advance, extending to the chest and neck regions. Expert consultations in cardiothoracic and general surgery led to further extensive surgical interventions, including complete glenohumeral disarticulation and fasciotomy over chest for surgical emphysema. Microbiological analysis identified Clostridium perfringens, Escherichia coli, and Enterococcus as causative organisms. Aggressive antibiotic therapy, repeated surgical debridement, and meticulous wound management ultimately resulted in a successful recovery. The patient was discharged 20 days after initial presentation, underscoring the critical importance of prompt recognition and multidisciplinary management in severe gas gangrene cases, particularly in patients with underlying medical comorbidities.

Keywords: Oozing blisters, subcutaneous crepitus, extensive necrosis, compartment syndrome.

Introduction

Gas gangrene or Clostridial myonecrosis is a necrotic infection of skin and soft tissue and it is characterized by the presence of gas under the skin which is produced by Clostridium. It is a potentially lethal disease which spreads quickly in soft tissues of the body. Tissue necrosis is due to production of exotoxins by spore forming gas producing bacteria in an environment of low oxygen. Gas gangrene is subclassified into two categories. Traumatic or post-operative is the most common form of gas gangrene accounting for 70% of the cases, followed by spontaneous or non-traumatic gangrene [1]. Clostridium perfringens is isolated in approximately 80% of patients presenting with traumatic gas gangrene, followed by Clostridium

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Dr. Jesmick Ponniah


Dr. Ganesan Ram Ganesan


Dr. Akshara Vijayendran

[1]Department of Orthopaedics, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India.

Address of Correspondence:
Dr. Jesmick Ponniah,
Department of Orthopaedics, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India.
E-mail: jesmickgarry@gmail.com

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Early diagnosis of lupus: A possibilty. A multicentric study from SLE Special Interest Group (SIG) of Indian Rheumatology Association (IRA)

Vineeta Shobha [1], Yogesh Preet Singh [2], Sourabh Malviya [3], Arul R Ponniah Subramanian [4], Liza Rajasekhar [5], Ranjan Gupta [6], Subramanian Nallasivan [7], Vijay Kr Rao [8], Avinash Jain [9], Aradhana Singh [9], Shaleni V [1], Sumithra Selvam [10], Deepak Yadav [11], John Mathew [12], Amita Aggarwal [11]

Affiliations
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Abstract

Introduction: Systemic Lupus Erythematosus (SLE) warrants an early diagnosis and prompt management. Delay in diagnosis can result in repeated flares, permanent damage, and even death. There is a large variability in the time taken to diagnose SLE across the world. We undertook this study to determine the time taken for diagnosis of SLE in India and to identify the factors associated.

Methods: Patients with SLE diagnosed within the previous 1 year as per Systemic Lupus Erythematosus International Collaborating Clinics criteria (SLICC) 2012 criteria were included in a cross-sectional multicentre questionnaire-based survey. Demographic profile, self-reported socioeconomic status as per Kuppuswamy classification of socioeconomic status (version 2022) (SES), and several healthcare related parameters including referral pattern were recorded. Median time taken for diagnosis was used to demarcate early or late diagnosis and associated factors were explored.

Results: We included 488 patients with SLE from 10 rheumatology centres. The median time to diagnosis was 6 months Interquartile Range (IQR 3,14.7) and within 3 months in about one third [150(30.7%)]. Very early diagnosis (<1 month) was established in 78(16.0%) patients. The mean SLE Disease Activity Index (SLEDAI) at diagnosis was 10.28+7.24. In univariate analysis, an older age, lower SES, non-southern state of residence and larger family size were significantly associated with late diagnosis. In the multivariate analysis, higher SES (AOR 0.95, 95% CI: 0.92-0.98), multiple organ system involvement at initial presentation (AOR1.75 95%CI: 1.08-2.84) and place of residence in south Indian states (AOR1.92 95%CI: 1.24-2.97) had lesser odds of being associated with late diagnosis. Distance from the closest medical centre/professional did not influence the time to diagnosis. Majority of patients had first consulted a medical graduate (42.5%) or postgraduate doctor (48.2%), and referral to rheumatologist was largely done by postgraduate (65%) doctors. More than half of our patients (61%) self-finance their treatment.

Conclusion: Median time to diagnosis of SLE was 6 months, 1/3rd being diagnosed within 3 months and 78(16.0%) with 1 month of symptom onset. Delay in diagnosis was noted in those belonging to lower socioeconomic strata and those with single organ disease. Distance to the health care facility did not influence time to diagnosis.

Keywords: Systemic lupus erythematosus; delay in diagnosis; referral pattern; socioeconomic strata.

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Case Reports

Eagle Syndrome: An Unusual Cause of Axial Neck Pain

A Case Report

Meenakshisundaram, Subbiah MS(Ortho), DNB(Ortho), FNB(Spine Surgery), FRCS Ed (Trauma & Orthopedic Surgery)[1,a]; Bangalore Kantharajanna, Shashidhar MS(Ortho), DNB(Ortho)[2]; Hawaldar, Sangamesh V. MS(Ortho), DNB(Ortho)[2]; Subbaraj, Rajavel MS(ENT), DLO(ENT)[3]

Author Information

[1]Department of Spine Surgery, Velammal Medical College Hospital and Research Institute, Madurai, India

[2]Department of Orthopaedics & Spine Surgery, Velammal Medical College Hospital and Research Institute, Madurai, India

[3]Department of Otorhinolaryngology, Velammal Medical College Hospital and Research Institute, Madurai, India

[a]E-mail address for M. Subbiah: subbuorth@yahoo.co.in

Investigation performed at Velammal Medical College and Research Institute, Madurai, Tamil Nadu, India

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Abstract

Case:

A 42-year-old woman presented with left-sided axial neck pain with radiation behind left ear of 3 months unresponsive to conservative treatment. As clinical examination revealed tenderness anterior to the mastoid process, she was referred to an otolaryngologist. Computed tomography showed an elongated left styloid process. Diagnostic local anesthetic infiltration provided complete pain relief confirming the diagnosis of Eagle syndrome (ES) after which a transoral excision of the left styloid process was performed. She was asymptomatic till the final follow-up of 15 months.

Conclusion:

ES should be considered in differential diagnosis of axial neck pain radiating to ear, and excision of the styloid process in resistant cases provides complete pain relief.

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Dean
Velammal Medical College Hospital
"Velammal Village"
Madural-Tuticorin Ring Road
Anuppanadi, Madural-625 009, T.N.

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REVIEW

WILEY

A historical timeline of the development and evolution of medical diagnostic ultrasonography

Arvind Rajamani FCICM, DDU[1,2] | Pranav Arun Bharadwaj HSC[3] | Sriram Hariharan MBBS[4] | Amritha Varshini Ragavan MBBS[5] | Anwar Hassan MPhty[6] | Hemamalini Arvind PhD[7] | Stephen Huang PhD[1]

[1]Nepean Clinical School, University of Sydney, Kingswood, New South Wales, Australia

[2]Department of Intensive Care Medicine, Nepean Hospital, Kingswood, New South Wales, Australia

[3]SPARTAN Collaborative, Baulkham Hills, New South Wales, Australia

[4]Aditya Diagnostics and Hospitals, Dibrugarh, India

[5]Velammal Medical College Hospital and Research Institute, Madurai, India

[6]Department of Physiotherapy, Nepean Hospital, Kingswood, New South Wales, Australia

[7]Division of Ophthalmology, University of Sydney Central Clinical School, Sydney, New South Wales, Australia

Correspondence
Arvind Rajamani, Nepean Clinical School, University of Sydney, Derby Street, Kingswood, NSW 2747, Australia.
Email: rrarvind@hotmail.com

Abstract

Diagnostic ultrasonography has evolved to become an indispensable imaging tool that permits non-invasive evaluation of the whole body. In this narrative review, we present a historical timeline of the invention, development, and evolution of diagnostic medical ultrasound. It includes interesting fun facts that may help the reader identify with many of the incredible researchers in this field. This review is a tribute to the researchers who contributed to this amazing invention.

KEYWORDS
history, learning ultrasound in critical care (LUCC), medical ultrasound

1 | BACKGROUND

Ultrasound is sound at a frequency beyond the audible range of the human ear, that is, >20 000 Hz.[1] Over the past seven decades, diagnostic ultrasonography has evolved to become an indispensable imaging tool that permits non-invasive evaluation of the whole body,[2] contributing at least 30% of all medical imaging worldwide![3] In this narrative review, we present a historical timeline of the invention, development, and evolution of diagnostic medical ultrasound and pay tribute to the researchers who contributed to this amazing invention.

2 | EARLY YEARS

The first reported scientific investigations on ultrasound involved some fascinating experiments in the 1700s by an Italian priest and physiologist Lazzaro Spallanzani (Figure 1), who sought to explain the ability of bats to navigate flight in darkness.[4,5] After blinding their eyes with a red-hot needle (imagine getting this through an ethics committee now!), he demonstrated that bats placed inside a pitch-dark room could still avoid obstacles while flying. However, when their mouths were covered, they bumped against obstacles. He concluded that "the ear of the bat serves more efficiently (than the eye)

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Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

Cureus

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In Vitro Human Fetal Pancreatic Islets to Redefine Pancreatic Research

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Sipra Rout [1], Soosai Manickam Amirtham [2], Mythraeyee Prasad [3], Anne George Cherian [4], Sandya Rani B [5], Yesudas Sudhakar [6], Neetu Prince [2]

1. Anatomy, All India Institute of Medical Sciences, Bhubaneswar, IND 2. Physiology, Christian Medical College and Hospital, Vellore, IND 3. Anatomy, Velammal Medical College Hospital and Research Institute, Madurai, IND 4. Community Medicine, Christian Medical College and Hospital, Vellore, IND 5. Research, Christian Medical College and Hospital, Vellore, IND 6. Biochemistry, Christian Medical College and Hospital, Vellore, IND

Corresponding author: Neetu Prince, drneetu@cmcvellore.ac.in

Abstract

Background: In vitro studies with human fetal islets of different gestational ages (GA) would be a great tool to generate information on the developmental process of the islets as this would help to recontextualize diabetes research and clinical practice. Pancreatic islets from human cadavers and other animal species are extensively researched to explore their suitability for islet transplantation procedure, one of the upcoming treatment strategies for insulin-dependent diabetes mellitus. Although human fetal islets are also considered for islet transplantation, ethical issues and limited knowledge constraints their use. The fetal islets could be explored to address the information lacunae on the maturity process of pancreatic islets and the endocrine-exocrine signaling mechanisms.

Aim: This study aimed to assess the feasibility of isolating viable islets and study the cytoarchitecture of the fetal pancreas of GA 22-29 weeks, not reported otherwise.

Methodology: Pancreas obtained from the aborted fetuses of GA 22-29 weeks were subjected to collagenase digestion and were further cultured to determine the viability in vitro. Parameters assessed were expression of markers for endocrine cell lineages and insulin release to glucose challenge.

Results: Islets were viable in vitro and islets were shown to maintain cues for post-digestion re-aggregation and expansion in culture. The immunofluorescent staining showed islets of varying sizes, homogenous cell clusters aggregating to form heterogenous cell clusters, otherwise not reported for this GA. On stimulation with different concentrations of glucose (2.8 and 28 mM), the fetal islets in the culture exhibited insulin release, and this response confirmed their viability in vitro.

Conclusion: Our findings showed that viable islets could be isolated and cultured in vitro for further in-depth studies to explore their proliferative potential as well as for the identification of pancreatic progenitors, a good strategy to take forward.

Categories: Endocrinology/Diabetes/Metabolism, Transplantation, Anatomy
Keywords: confocal, cell clustering, insulin release, islet regeneration, fetal pancreas

Introduction

The possibility of using pancreatic islets for transplantation in insulin-dependent diabetic mellitus recipients had intrigued researchers for a substantial period now. The prospects of using fetal pancreatic tissue as a suitable and feasible alternative gained pace in the field when the paucity of organ donors started to become an impeding factor in islet transplantation [1-3]. The high immunogenicity and poor self-renewal of the adult pancreas might potentially be addressed using human fetal pancreatic precursor tissues [1]. Pre-clinical models provide evidence for using fetal tissues due to proliferative potential [4-6]. In 2004, Djordjevic's team could temporarily restore the glucose levels with human fetal islet transplantation in type 1 diabetic patients [7]. However, considering the ethical issues associated with the use of human fetal tissues and limited knowledge, the focus of such studies has shifted to other stem cells which could be differentiated into insulin-producing β cells [8-10]. Despite the advances in differentiation protocols of human stem cell populations toward pancreatic β cells, significant work remains to be done before cell transplantation of stem cell-derived β cells. Functional and structural differences between human fetal and adult pancreatic tissues have been known to some extent. Most of the reported studies are on fetal pancreas from the first trimester abortions where they have assessed for insulin release and transplantation studies [11]. The development of culture models of islets across the gestational ages (GA) would add benefit to enhance the understanding of the growth dynamics of the endocrine pancreas as these information details are limited [12-15]. A better knowledge of the developmental process would be helpful to deal with disease entities in a better way. The rationale behind performing this study was to see if viable islets could be isolated to study the islet characteristics at this GA.

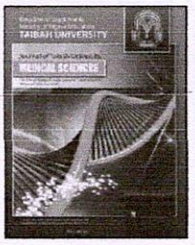
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Velammal Village
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Original Article

Anatomical variation in the sphenoidal sinuses in patients with chronic rhinosinusitis: A CT scan study

Vinodhini Periyasamy, PhD [a,†], Radhakrishnan Sumana, M.D [b], Anupama Doddappaiah, M.D [c] and Rathinasabapathy Mythilikrishnan, M.D [a,*]

[a] *Department of Anatomy, Karuna Medical College, Vilayodi, Kerala, India*
[b] *Department of Anatomy, Velammal Medical College Hospital & Research Institute, Madurai, Tamil Nadu, India*
[c] *Department of Anatomy, Shridevi Institute of Medical Sciences and Research Hospital, Tumkur, Karnataka, India*

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المخلص

أهداف البحث: يعد فهم تشريح الجيوب الأنفية أمرا بالغ الأهمية لتخطيط الجراحة قبل العملية. تهدف هذه الدراسة إلى تقييم العلاقة بين التغيرات التشريحية للجيوب الجبهية والتهاب الجيوب الأنفية المزمن باستخدام الأشعة المقطعية.

طرق البحث: أجريت دراسة وصفية على المرضى الذين يعانون من التهاب الجيوب الأنفية المزمن، والذين أحيلوا لإجراء الأشعة المقطعية إلى قسم التشخيص بالأشعة والتصوير، وتمت مقارنة المعلمات بين مجموعات الدراسة والسيطرة.

النتائج: من بين التغيرات التشريحية، كانت وجود أجزاء مساعدة مكررة داخل الجيب الجبهي، وانحسار وبروز الشريان السباتي الداخلي والعصب البصري مرتفعة في الذكور والإناث من الحالات مقارنة بالمجموعة المرجعية. بين التغيرات التشريحية في منطقة الجيوب الأنفية للمشاركين الذكور في مجموعات الدراسة، كان هناك ارتباط كبير مع بروز العصب البصري وانحساره. أظهر بروز العصب البصري في الذكور خطرا أعلى للإصابة بالتهاب الجيوب الأنفية المزمن بين مجموعة الدراسة.

الاستنتاجات: توفر المعرفة حول التغيرات التشريحية في الجيوب الجبهية فهما أفضل لحدود الاستئصال الجراحي خلال علاج جراحات الجيوب الجبهية.

الكلمات المفتاحية: التغيرات التشريحية؛ الأشعة المقطعية المحوسبة؛ التهاب الجيوب الأنفية المزمن؛ الشريان السباتي الداخلي؛ العصب البصري؛ الجيب الجبهي

Abstract

Computerized tomography (CT) of the skull base region has become an indispensable tool for endoscopic sinonasal surgery.

Objectives: Fundamental knowledge of the sinus anatomy is crucial for preoperative surgical planning. The aim of this research was to evaluate associations between the anatomical variations sphenoidal sinuses and chronic rhinosinusitis (CRS) by using CT.

Methods: A descriptive study was performed on patients with CRS, who were referred to the department of radiodiagnosis and imaging for CT scanning. Parameters were compared between the study and control groups.

Results: Among the anatomical variations, the presence of bilateral accessory septa within the sphenoidal sinus, and dehiscence and protrusion of the internal carotid artery and optic nerve (ON), were high in men and women in the case group compared with the control group. Among the anatomical variations in the sinonasal region of the male participants, a significant association ($p < 0.05$) was observed with ON protrusion and ON dehiscence. ON protrusion (OR = 2.168) in men was associated with elevated risk of CRS in the study population.

Conclusion: Knowledge of the anatomical variations in the sphenoid sinuses enables better understanding of the

* Corresponding address: Department of Anatomy, Karuna Medical College, Vilayodi, Kerala, India.
E-mail: mythustan@gmail.com (R. Mythilikrishnan)
Peer review under responsibility of Taibah University.
† Present address: Assistant Professor, Department of Anatomy, Shridevi Institute of Medical Sciences and Research Hospital, Tumkur, Karnataka.

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Prof. T. THIRUMAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
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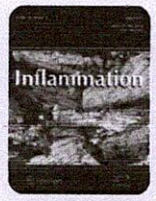
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Low Serum Hepcidin Levels in Patients with Ulcerative Colitis – Implications for Treatment of Co-existent Iron-Deficiency Anemia

RESEARCH Published: 24 July 2023

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A Correction to this article was published on 11 August 2023

This article has been updated

Abstract

Ulcerative colitis (UC) is often associated with anemia. Hepcidin, the central regulator of iron homeostasis, is known to be induced by inflammation and suppressed by anemia. It is not clear how hepcidin is affected in those with UC, when both inflammation and anemia may co-exist.Such knowledge may hold implications for treatment.

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Velammal Medical College Hospital
"Velammal Village"
Anuppanadi, Madurai-625 009, T.N.

Hematological and iron-related parameters, C-reactive protein (CRP), growth differentiation factor 15 (GDF-15) and erythroferrone (ERFE) (erythroid regulators of hepcidin) levels were estimated in blood from those with UC and in control subjects. Values for hematological and iron-related parameters showed evidence of iron-deficiency and resultant anemia, in patients with UC. The presence of UC was significantly associated with inflammation. Serum levels of ERFE, but not of GDF-15, were significantly higher in patients with UC than in control patients, while hepcidin levels were significantly lower. Serum hepcidin concentrations in patients with UC correlated positively with serum iron, ferritin and GDF-15, and negatively with serum ERFE. The iron status and serum hepcidin levels in UC patients with co-existent anemia were significantly lower and serum ERFE values significantly higher than in those with UC without anemia. The effect of anemia on hepcidin predominated over that of inflammation in patients with UC, resulting in suppressed hepcidin levels. This effect is possibly mediated through erythroferrone. We suggest that a serum hepcidin-guided approach may be useful to guide use of oral iron supplements to treat co-existent iron-deficiency anemia in patients with UC and other chronic inflammatory diseases.

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"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

Association of Dietary Patterns and Health Outcomes by Spatial Regression Analysis of Nationally Representative Survey Data from India

Padmanaban Venkatesan[1], S. S. Prakash[1], Jagadish Ramasamy[1,2]

[1]Associate Professor, Department of Biochemistry, Christian Medical College (Affiliated to the Tamil Nadu Dr. MGR Medical University, Chennai, India), Vellore, [2]Associate Professor, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India

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Abstract

Background: Our aim was to study the regional differences in dietary patterns in India and their association with population-level nutrition-related health indicators such as the prevalence of anemia, overweight, undernutrition, and hyperglycemia. **Objectives:** To identify and characterize the dietary patterns from publicly available nationally representative survey data on food consumption conducted by the National Sample Survey Office (NSSO) to study the regional differences in dietary patterns. **Methods:** Dietary patterns were identified by factor analysis of per capita food consumption data from the household consumer expenditure survey (2011). Mean factor scores of dietary patterns were calculated for each district separately for urban and rural regions. Ecological association of factor scores with the district-level percentage prevalence of health indicators from the National Family Health Survey-4 (2015–2016) data was done by the Spatial Durbin Model of spatial regression analysis. **Results:** Factor analyses revealed four dietary patterns which were similar in terms of the food items that characterized the factors for both rural and urban regions. Direct effects of dietary patterns by spatial regression analyses were observed with several health outcomes after adjusting for differences in socioeconomic development. Prevalence of anemia was positively associated with "Milk and wheat-rich diet" among men in the rural regions but negatively associated with other dietary patterns. Prevalence of overweight and high blood glucose was positively associated with "Rice and meat-rich diet" and "Coconut and seafood rich diet" in the rural regions. "Refined oil and tur dal-rich diet" was positively associated with the prevalence of overweight and hypertension in urban regions and negatively associated with underweight and anemia in men in rural and urban regions. **Conclusions:** Spatial regression analyses revealed several important associations between dietary patterns and health outcomes, mostly in rural regions and some in urban regions. These results suggest the role of the major food items consumed in different regions and their impact on health outcomes in India and may have implications in tailoring dietary modifications accordingly.

Key words: Dietary pattern, factor analysis, food consumption, National Family Health Survey-4, nutrition indicators, public health

Introduction

With a population of more than 1.3 billion people, India is one of the most diverse countries in the world. There is a diversity of food consumption in India as a result of cultural diversity and also possibly because of socioeconomic differences and other factors.[1] Certain variations in the food consumption pattern in different regions of India are widely known. For instance, there are differences in the intake of the major cereals (rice or wheat), the quantity of milk and milk-based food items, and meat consumption across the regions of India. However, an objective assessment of the actual amounts of the major components of food consumption in a representative population of a large sample size would help in identifying reliable dietary patterns in India.

There exists a strong relationship between the health status of populations and the dietary consumption of nutrients.[2] Dietary patterns reflect the combination of food items that are consumed by individuals.[3] Dietary patterns provide additional information compared to single nutrient intake

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Address for correspondence: Dr. Padmanaban Venkatesan, Department of Biochemistry, Christian Medical College, Vellore - 632 002, Tamil Nadu, India.
E-mail: padmanaban55@cmcvellore.ac.in

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Prof. T. Thiruvengadam, M.D., D.A.,
Dean
Velammal Medical College Hospital and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Comparison of Left Bundle Branch Area Pacing and Biventricular Pacing in Candidates for Resynchronization Therapy

Pugazhendhi Vijayaraman, MD,[a] Parikshit S. Sharma, MD, MPH,[b] Óscar Cano, MD, PHD,[c] Shunmuga Sundaram Ponnusamy, MD, DM,[d] Bengt Herweg, MD,[e] Francesco Zanon, MD,[f] Marek Jastrzebski, MD, PHD,[g] Jiangang Zou, MD,[h] Mihail G. Chelu, MD, PHD,[i] Kevin Vernooy, MD, PHD,[j] Zachary I. Whinnett, MD, PHD,[k] Girish M. Nair, MBBS, MSc,[l] Manuel Molina-Lerma, MD,[m] Karol Curila, MD, PHD,[n] Dipen Zalavadia, MD,[a] Abdul Haseeb, MD,[a] Cicely Dye, MD,[b] Sharath C. Vipparthy, MD,[b] Ryan Brunetti, MD,[e] Pawel Moskal, MD,[o] Alexandra Ross, RN,[k] Antonius van Stipdonk, MD, PHD,[j] Jerin George, MD,[p] Yusuf K. Qadeer, MD,[p] Mishal Mumtaz, MD,[e] Jeffrey Kolominsky, MD,[q] Syeda A. Zahra, MD,[k] Mehrdad Golian, MD,[l] Lina Marcantoni, MD,[f] Faiz A. Subzposh, MD,[a] Kenneth A. Ellenbogen, MD[q]

ABSTRACT

BACKGROUND Cardiac resynchronization therapy (CRT) with biventricular pacing (BVP) is a well established therapy in patients with reduced left ventricular ejection fraction (LVEF), heart failure, and wide QRS or expected frequent ventricular pacing. Left bundle branch area pacing (LBBAP) has recently been shown to be a safe alternative to BVP.

OBJECTIVES The aim of this study was to compare the clinical outcomes between BVP and LBBAP among patients undergoing CRT.

METHODS This observational study included patients with LVEF ≤35% who underwent BVP or LBBAP for the first time for Class I or II indications for CRT from January 2018 to June 2022 at 15 international centers. The primary outcome was the composite endpoint of time to death or heart failure hospitalization (HFH). Secondary outcomes included endpoints of death, HFH, and echocardiographic changes.

RESULTS A total of 1,778 patients met inclusion criteria: 981 BVP, 797 LBBAP. The mean age was 69 ± 12 years, 32% were female, 48% had coronary artery disease, and mean LVEF was 27% ± 6%. Paced QRS duration in LBBAP was significantly narrower than baseline (128 ± 19 ms vs 161 ± 28 ms; $P < 0.001$) and significantly narrower compared to BVP (144 ± 23 ms; $P < 0.001$). Following CRT, LVEF improved from 27% ± 6% to 41% ± 13% ($P < 0.001$) with LBBAP compared with an increase from 27% ± 7% to 37% ± 12% ($P < 0.001$) with BVP, with significantly greater change from baseline with LBBAP (13% ± 12% vs 10% ± 12%; $P < 0.001$). On multivariable regression analysis, the primary outcome was significantly reduced with LBBAP compared with BVP (20.8% vs 28%; HR: 1.495; 95% CI: 1.213-1.842; $P < 0.001$).

CONCLUSIONS LBBAP improved clinical outcomes compared with BVP in patients with CRT indications and may be a reasonable alternative to BVP. (J Am Coll Cardiol 2023;82:228-241) © 2023 by the American College of Cardiology Foundation.

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From the [a]Geisinger Heart Institute, Wilkes Barre, Pennsylvania, USA; [b]Rush University Medical Center, Chicago, Illinois, USA; [c]Hospital Universitari i Politècnic La Fe and Centro de Investigaciones Biomédicas en RED en Enfermedades Cardiovasculares, Valencia, Spain; [d]Velammal Medical College Hospital and Research Institute, Madurai, India; [e]University of South Florida Morsani College of Medicine, Tampa, Florida, USA; [f]Santa Maria Della Misericordia Hospital, Rovigo, Italy; [g]First Department of Cardiology, Interventional Electrocardiology and Hypertension, Jagiellonian University, Medical College, Krakow, Poland; [h]Cardiology, First Affiliated Hospital of Nanjing Medical University, Nanjing, Jiangsu, China; [i]Baylor College of Medicine and Texas Heart Institute, Houston, Texas, USA; [j]Department of Cardiology, Cardiovascular Research Institute Maastricht, Maastricht University Medical Center, Maastricht, the Netherlands; [k]National Heart and Lung Institute, Imperial College London, London, United Kingdom; [l]University of Ottawa Heart Institute, Ottawa, Ontario, Canada; [m]Hospital Universitario Virgen de las Nieves, Granada, Spain; [n]Cardiocenter, Third Faculty of Medicine, Charles University, Prague, Czech Republic; [o]Electrophysiology Laboratory, University Hospital in Krakow, Krakow, Poland; [p]Baylor College of Medicine, Houston, Texas, USA; and the [q]Virginia Commonwealth University Medical Center, Richmond, Virginia, USA.

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Dr. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Circulation

ORIGINAL RESEARCH ARTICLE

Arrhythmic Risk in Biventricular Pacing Compared With Left Bundle Branch Area Pacing: Results From the I-CLAS Study

Bengt Herweg, MD; Parikshit S. Sharma, MD, MPH; Óscar Cano, MD, PhD; Shunmuga Sundaram Ponnusamy, MD; Francesco Zanon, MD; Marek Jastrzebski, MD, PhD; Jiangang Zou, MD; Mihail G. Chelu, MD, PhD; Kevin Vernooy, MD, PhD; Zachary I. Whinnett, MD, PhD; Girish M. Nair, MBBS, MSc; Manuel Molina-Lerma, MD; Karol Curila, MD, PhD; Dipen Zalavadia, MD; Cicely Dye, MD; Sharath C. Vipparthy, MD; Ryan Brunetti, MD; Mishal Mumtaz, MD; Pawel Moskal, MD; Andrew M. Leong, MD; Antonius van Stipdonk, MD, PhD; Jerin George, MD; Yusuf K. Qadeer, MD; Jeffrey Kolominsky, MD; Mehrdad Golian, MD; Ramez Morcos, MD; Lina Marcantoni, MD; Faiz A. Subzposh, MD; Kenneth A. Ellenbogen, MD; Pugazhendhi Vijayaraman, MD

BACKGROUND: Left bundle branch area pacing (LBBAP) may be associated with greater improvement in left ventricular ejection fraction and reduction in death or heart failure hospitalization compared with biventricular pacing (BVP) in patients requiring cardiac resynchronization therapy. We sought to compare the occurrence of sustained ventricular tachycardia (VT) or ventricular fibrillation (VF) and new-onset atrial fibrillation (AF) in patients undergoing BVP and LBBAP.

METHODS: The I-CLAS study (International Collaborative LBBAP Study) included patients with left ventricular ejection fraction ≤35% who underwent BVP or LBBAP for cardiac resynchronization therapy between January 2018 and June 2022 at 15 centers. We performed propensity score–matched analysis of LBBAP and BVP in a 1:1 ratio. We assessed the incidence of VT/VF and new-onset AF among patients with no history of AF. Time to sustained VT/VF and time to new-onset AF was analyzed using the Cox proportional hazards survival model.

RESULTS: Among 1778 patients undergoing cardiac resynchronization therapy (BVP, 981; LBBAP, 797), there were 1414 propensity score–matched patients (propensity score–matched BVP, 707; propensity score–matched LBBAP, 707). The occurrence of VT/VF was significantly lower with LBBAP compared with BVP (4.2% versus 9.3%; hazard ratio, 0.46 [95% CI, 0.29–0.74]; $P<0.001$). The incidence of VT storm (>3 episodes in 24 hours) was also significantly lower with LBBAP compared with BVP (0.8% versus 2.5%; $P=0.013$). Among 299 patients with cardiac resynchronization therapy pacemakers (BVP, 111; LBBAP, 188), VT/VF occurred in 8 patients in the BVP group versus none in the LBBAP group (7.2% versus 0%; $P<0.001$). In 1194 patients with no history of VT/VF or antiarrhythmic therapy (BVP, 591; LBBAP, 603), the occurrence of VT/VF was significantly lower with LBBAP than with BVP (3.2% versus 7.3%; hazard ratio, 0.46 [95% CI, 0.26–0.81]; $P=0.007$). Among patients with no history of AF (n=890), the occurrence of new-onset AF >30 s was significantly lower with LBBAP than with BVP (2.8% versus 6.6%; hazard ratio, 0.34 [95% CI, 0.16–0.73]; $P=0.008$). The incidence of AF lasting >24 hours was also significantly lower with LBBAP than with BVP (0.7% versus 2.9%; $P=0.015$).

CONCLUSIONS: LBBAP was associated with a lower incidence of sustained VT/VF and new-onset AF compared with BVP. This difference remained significant after adjustment for differences in baseline characteristics between patients with BVP and LBBAP. Physiological resynchronization by LBBAP may be associated with lower risk of arrhythmias compared with BVP.

Key Words: arrhythmias, cardiac ■ atrial fibrillation ■ cardiac pacing, artificial ■ cardiac resynchronization therapy ■ defibrillators, implantable ■ tachycardia, ventricular

Correspondence to: Pugazhendhi Vijayaraman, MD, Geisinger Heart Institute, Geisinger Wyoming Valley Medical Center, MC 36-10, 1000 E Mountain Blvd, Wilkes-Barre, PA 18711. Email pvijayaraman1@geisinger.edu or pvijayaraman@gmail.com

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009.

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Education in Heart

Pacing induced cardiomyopathy: recognition and management

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Shunmuga Sundaram Ponnusamy [1], Thabish Syed [1], Pugazhendhi Vijayaraman [2]

Correspondence to Dr Pugazhendhi Vijayaraman, Geisinger Wyoming Valley Medical Center, Wilkes-Barre, PA 18711, USA; pvijayaraman@gmail.com

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Abstract

Right ventricle (RV) apex continues to remain as the standard pacing site in the ventricle due to ease of implantation, procedural safety and lack of convincing evidence of better clinical outcomes from non-apical pacing sites. Electrical dyssynchrony resulting in abnormal ventricular activation and mechanical dyssynchrony resulting in abnormal ventricular contraction during RV pacing can result in adverse LV remodelling predisposing some patients for recurrent heart failure (HF) hospitalisation, atrial arrhythmias and increased mortality. While there are significant variations in the definition of pacing induced cardiomyopathy (PIC), combining both echocardiographic and clinical features, the most acceptable definition for PIC would be left ventricular ejection fraction (LVEF) of <50%, absolute decline of LVEF by ≥10% and/or new-onset HF symptoms or atrial fibrillation (AF) after pacemaker implantation. Based on the definitions used, the prevalence of PIC varies between 6% and 25% with overall pooled prevalence of 12%. While most patients undergoing RV pacing do not develop PIC, male sex, chronic kidney disease, previous myocardial infarction, pre-existing AF, baseline LVEF, native QRS duration, RV pacing burden, and paced QRS duration are the factors associated with increased risk for PIC. While conduction system pacing (CSP) using His bundle pacing and left bundle branch pacing appear to reduce the risk for PIC compared with RV pacing, both biventricular pacing and CSP may be used to effectively reverse PIC.

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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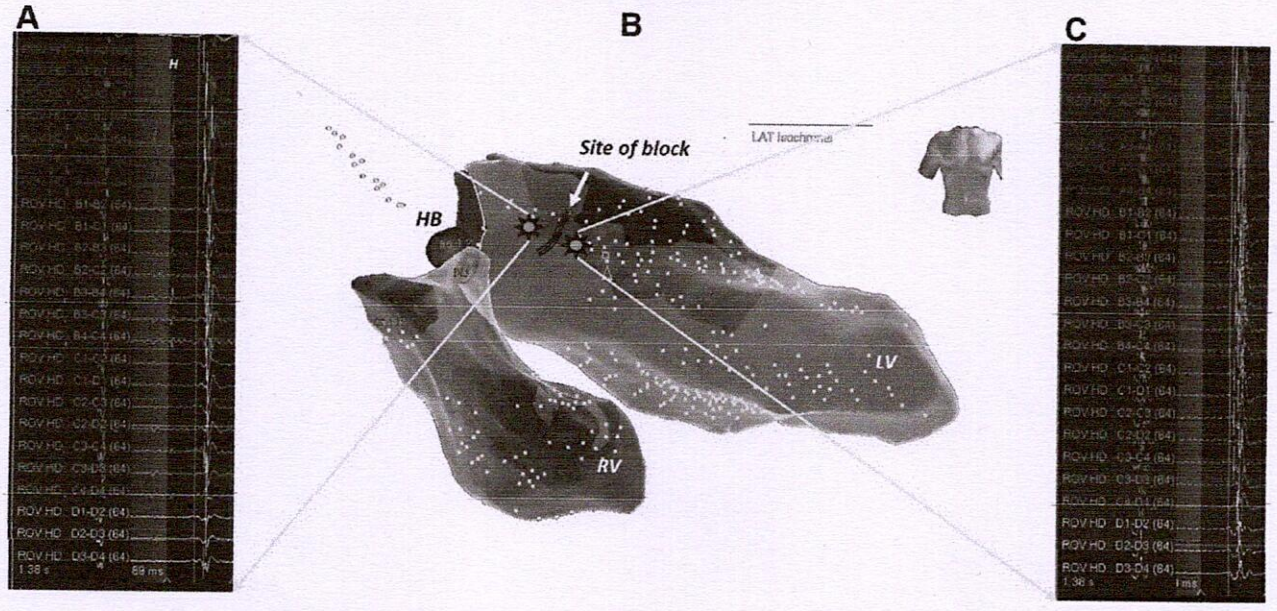
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Electrical Resynchronization After Left Bundle Branch Pacing

Shunmuga Sundaram Ponnusamy, MD, DM,[a] Sabari Saravanan, BE,[b] William Basil, BE,[c] Pugazhendhi Vijayaraman, MD[d]

A 56-year-old woman underwent left bundle branch pacing (LBBP) for nonischemic cardiomyopathy with left bundle branch block (LBBB) (QRS duration 140 milliseconds) and left ventricular (LV) ejection fraction of 32% using a C315 sheath and 3830 SelectSecure lead (Medtronic). LBBP resulted in complete correction of LBBB with paced QRS duration of 102 milliseconds and R-wave

FIGURE 1 Electroanatomical Mapping During Baseline Left Bundle Branch Block



(A) Earliest activation was noted distal interventricular septum at the insertion site of right bundle branch into the moderator band. Left ventricular (LV) activation was activated through transeptal conduction from the right ventricle (RV) at the distal aspect of the septum after a delay of 28 milliseconds. **(B)** The lateral wall of the LV was the last site to be activated. A multielectrode catheter showed left intrahisian block just below the noncoronary cusp, as demonstrated by an absent His signal below the site of the blocked HV interval before the block was 60 milliseconds. HB = His bundle; LAT = local activation time.

From the [a]Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, India; [b]Abbott EP, Madurai, India; [c]Medtronic India Private Limited, Madurai, India; and the [d]Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes-Barre, Pennsylvania, USA.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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Dean
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and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Factors associated with unexplained sudden deaths among adults aged 18-45 years in India – A multicentric matched case–control study

Manickam Ponnaiah[1a], Tarun Bhatnagar[1b], Rizwan Suliankachi Abdulkader[1a], Rajalakshmi Elumalai[1a], Janani Surya[1c], Kathiresan Jeyashree[1c], Muthusamy Santhosh Kumar[1b], Ranjithkumar Govindaraju[1c], Jeromie Wesley Vivian Thangaraj[1c], Hari Krishan Aggarwal[12], Suresh Balan[4], Tridip Dutta Baruah[14], Ayan Basu[15], Yogita Bavaskar[18], Ajeet Singh Bhadoria[21], Ashish Bhalla[22], Pankaj Bhardwaj[23], Rachana Bhat[26], Jaya Chakravarty[32], Gina Maryann Chandy[5], Bal Kishan Gupta[24], Rakesh Kakkar[36], Ali Hasan Faiz Karnam[37], Sushila Kataria[13], Janakkumar Khambholja[42], Dewesh Kumar[39], Nithin Kumar[27,31], Monaliza Lyngdoh[40], M. Selva Meena[6], Kedar Mehta[41], M. P. Sheethal[28], Subhasis Mukherjee[16], Anuj Mundra[44], Arun Murugan[2], Seetharaman Narayanan[7], Balamurugan Nathan[38a], Jutika Ojah[45], Pushpa Patil[29], Sunita Pawar[19], A. Charles Pon Ruban[9], R. Vadivelu[10], Rishabh Kumar Rana[46], S. Nagendra Boopathy[3], S. Priya[11], Saroj Kumar Sahoo[47], Arti Shah[43], Mohammad Shameem[33], Karthikeyan Shanmugam[8], Sachin K. Shivnitwar[20], Abhishek Singhai[48], Saurabh Srivastava[34], Sudheera Sulgante[30], Arunansu Talukdar[17], Alka Verma[35], Rajaat Vohra[25], Rabbanie Tariq Wani[49], Bhargavi Bathula[1a], Gayathri Kumari[1c], Divya Saravana Kumar[1c], Aishwariya Narasimhan[1c], N. C. Krupa[1a], Thirumaran Senguttuvan[1a], Parvathi Surendran[1c], Dharsikaa Tamilmani[1a], Alka Turuk[50], Gunjan Kumar[50], Aparna Murkherjee[50], Rakesh Aggarwal[38b], Manoj Vasant Murhekar[1c] & Sudden Adult Deaths Study Group*

[1a]Division of Online Courses, [1b]ICMR School of Public Health, [1c]Division of Epidemiology and Biostatistics, ICMR-National Institute of Epidemiology, Chennai, [2]Department of Community Medicine, Government Medical College, Omandurar Government Estate, [3]Department of Cardiology, Sri Ramachandra Institute of Higher Education & Research, Chennai, [4]Department of Community Medicine, Kanyakumari Government Medical College, Kanyakumari, [5]Department of Emergency Medicine, Christian Medical College & Hospital, Vellore, [6]Department of Community Medicine, Government Medical College, Virudhunagar, [7]Department of Community Medicine, KMCH Institute of Health Sciences & Research, Coimbatore, [8]Department of Community Medicine, PSG Institute of Medical Sciences & Research, Coimbatore, [9]Department of Community Medicine, Tirunelveli Medical College & Hospital, Tirunelveli, [10]Department of Cardiology, Velammal Medical College Hospital & Research Institute, Madurai, [11]Institute of Community Medicine, Madurai Medical College, Madurai, Tamil Nadu, [12]Department of Medicine, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, [13]Department of Internal Medicine, Medanta, Gurugram, Haryana, [14]Department of General Surgery, All India Institute of Medical Sciences, Raipur, Chhattisgarh, [15]Infectious Disease Department, Institute of Post-Graduate Medical Education & Research, [16]Department of Respiratory Medicine, College of Medicine & Sagore Dutta Hospital, [17]Department of Geriatric Medicine, Medical College Kolkata, West Bengal, [18]Department of Community Medicine, Government Medical College, Jalgaon, [19]Department of Community Medicine, Dr. Vasantrao Pawar Medical College, Hospital & Research Center, Nashik, [20]Department of Medicine, Dnyandeo Yashwantrao Patil Medical College, Pune, Maharashtra, [21]Department of Community and Family Medicine, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, [22]Department of Internal Medicine, Post Graduate

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
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RESEARCH LETTER

Electrophysiological characteristics of left bundle branch potential during implantation

Check for updates

Shunmuga Sundaram Ponnusamy, MD, DM, CEPS,* Vithiya Ganesan, MD,† Vadivelu Ramalingam, MD, DM,* Palaniappan Nachammai, MBBS,* Pugazhendhi Vijayaraman, MD, FHRS‡

*From the *Department of Cardiology, Velammal Medical College, Madurai, India, †Department of Microbiology, Velammal Medical College, Madurai, India, and ‡Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes Barre, Pennsylvania.*

Left bundle branch pacing (LBBP) provides electrical and mechanical synchrony at low stable thresholds. A left bundle branch (LBB) potential can be demonstrated in all patients with normal anterograde LBB activation during sinus rhythm. Su et al[1] noted LBB current of injury (COI) in 67% of patients with LBB potential and documented 3 different types of LBB COI. However, no studies have described the different patterns of LBB potential during implantation. We aimed to analyze the electrophysiological characteristics of the LBB potential and its clinical significance during LBBP.

This was a retrospective, observational, single-center study of consecutive patients who had undergone successful LBBP using the 3830 SelectSecure™ lead (Medtronic, Minneapolis, MN) by a premature ventricular complex–guided approach.[2] Rapid rotations during deployment resulted in premature ventricular complexes with morphology changing from QS to qR/rSR in lead V_1 as the lead traversed from right to left in the septum (Figure 1). Filtered (30–300 Hz) and unfiltered (0.5–500 Hz) unipolar electrograms were used to monitor the LBB potential and COI, respectively. The study was approved by the institutional review board and adhered to the Guidelines of the Declaration of Helsinki. LBB capture was confirmed per standard criteria.[2] Patients with baseline LBB block morphology were excluded. Based on electrophysiological characteristics, the LBB potential was classified into 2 types: (1) type A (manifest potential), in which a high-frequency potential was noted immediately after lead deployment; and (2) type B (concealed potential), in which the potential was concealed within the slurred negative COI initially and resurged over few minutes gradually to form a predominant negative deflection followed by sharp biphasic potential (Figure 1).

KEYWORDS Left bundle branch potential; Current of injury; Concealed potential; Nonselective to selective capture transition; Left bundle branch pacing (Heart Rhythm 2023;20:1595–1596)

Address reprint requests and correspondence: Dr Shunmuga Sundaram Ponnusamy, Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamilnadu, India 625009. E-mail address: shunmuga.pgi@gmail.com.

LBB potential could be demonstrated in 203 of 249 patients (81.5%) without baseline LBB block. Type A potential was noted in 130 patients (64%) and type B in 73 patients (36%). There was no significant difference in baseline left ventricular (LV) function, QRS duration, and capture threshold between the groups. Type B potential was most commonly noted in female patients (Figure 1). R-wave amplitude was significantly less in type B than type A (8.2 ± 4.6 mV vs 9.8 ± 5.3 mV; $P = .03$). The potential to QRS onset duration (PV) was significantly longer in type B than type A (27.2 ± 7.6 ms vs 23.2 ± 3.9 ms; $P < .0001$). In patients with type A potential, an output-dependent change in QRS morphology showed nonselective to selective capture transition in 58% (n = 75), nonselective to septal transition in 22% (n = 29), and no transition in 20% (n = 26) at the time of implantation (Figure 1). In patients without transition, other criteria were used to confirm LBB capture. All patients with type B potential (100% [n = 73]) showed nonselective to selective capture transition. Further rotations should be avoided after a type B pattern is observed because the rotations may result in septal perforation. Mean duration of resurgence of concealed type B potential was 9.1 ± 1.5 minutes.

The main findings of our study are as follows. (1) LBB potentials can be classified at initial implant into type A (manifest) and type B (concealed). (2) Type B potential was observed when the lead was deployed in the proximal aspect of the left conduction system as evidenced by the longer PV duration. (3) Appearance of type B potential could be considered an endpoint for further rotations as selective capture response was observed in all patients.

Su et al[1] demonstrated 3 different patterns of LBB COI: (1) type 1, with high-frequency potential followed by a horizontal PV-segment elevation; (2) type 2, with concealed potential inside the PV segment; and (3) type 3, with deep negative PV-segment deflection. In our study, we assessed the electrophysiological properties and clinical significance of the LBB potential rather than the COI. Type A was the most common and was characterized by manifest sharp biphasic potential immediately after lead deployment, with mean PV duration of 23.2

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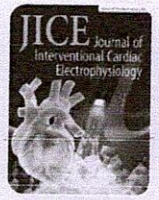
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Case Report

Helix un-winding of lumenless lead during attempted left bundle branch area pacing

Ramalingam Vadivelu [a,*], Ponnusamy Shunmugasundaram [a], Senthil Murugan [a], Yash Lokhandwala [b]

[a] Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, India
[b] Department of Cardiology, Bandra Holy Family Hospital and Research Institute, India

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1. Case report

A 63-year-old male presented with complaints of recent onset recurrent episodes of giddiness and syncope. His ECG showed complete heart block with ventricular rate of 40 bpm and wide QRS escape, QRS duration (QRSD) of 124 milliseconds and right bundle branch block (RBBB) morphology (Fig. 1). Echocardiogram showed normal biventricular function. There was concentric LVH with interventricular septal thickness of 15 mm.

After obtaining informed consent, patient was taken up for left bundle branch area pacing (LBBP). Continuous monitoring of intracardiac electrogram was done using electrophysiology system (Abbott, Plymount). Electrophysiology study performed before pacemaker implantation suggested infranodal atrio-ventricular (AV) block. Distal His bundle electrogram was recorded and the cine was recorded in right anterior oblique (RAO) 30-degree view and stored as the reference. The C 315 His delivery sheath (Medtronic, Minneapolis, MN) was positioned 2 cm below the distal His signals. A 4.1F sized lumenless Select Secure™ 3830 lead (Medtronic, Minneapolis, MN) was delivered through the C 315 sheath.

Unipolar pacing mapping done there showed "W" notch in V1 and tall "R" wave in lead II and discordant QRS complexes in lead aVR and aVL. Rapid rotation of the 3830 lead was performed which resulted in penetration of right ventricular subendocardial aspect of the septum after which there was no further progression (Fig. 2A). Unipolar pacing suggested mid-septal pacing with notched QS complex in lead V1(Fig. 2B). Additional rotations were given but the lead could not be penetrated further into the septum despite adequate support. Lead buckling was noted. Endocardial entanglement effect was considered and decided to disengage the lead from this position and try at different location. Counter-clockwise rotations were given for unscrewing the lead. But the lead could not be disengaged despite multiple attempts. During this process of unscrewing and traction, the lead helix got elongated and the screw mechanism failed. The tip of the C 315 sheath also got damaged (Fig. 3A and 3B). Subsequently the delivery sheath was pushed further to oppose it to the septum and manual traction along with counter-clockwise rotation was done which successfully disengaged the lead en masse from the septum. As LBBP attempt was failed, RV mid-septal pacing was done using conventional stylet driven lead. Immediate post-procedure echocardiography did not show any evidence of ventricular septal defect, septal hematoma, pericardial effusion or tricuspid regurgitation.

* Corresponding author. Cardiologist and Electrophysiologist, Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamilnadu, 625009, India.
E-mail address: vvelu00@gmail.com (R. Vadivelu).
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Prof. T. THIRUNAVUKKARASU, M.D., D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009. T.N.

Journal of Cardiovascular Electrophysiology / Volume 34, Issue 11 / p. 2246-2254

ORIGINAL ARTICLES

Observations of interventricular septal behavior during left bundle branch pacing

Shunmuga Sundaram Ponnusamy MD, DM, CEPS ✉, Vidhya Ganesan MD, Vijesh Anand MD, DNB, Ramalingam Vadivelu MD, DM, Mahesh Kumar MD, DM, PDF ... See all authors

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Disclosures: Shunmuga Sundaram Ponnusamy: Consultant, Medtronic; Pugazhendhi Vijayaraman: Speaker, Consultant, Research, Fellowship support—Medtronic; Consultant—Abbott, Biotronik, Boston Scientific; Patent—HBP delivery tool; Other authors: No disclosures.

Abstract

Introduction

Left bundle branch pacing (LBBP) involves the deployment of the lead deep inside the septum. Penetration of the septum by the lead depends on the texture of the septum, rapidity of rotations, operator experience, and implantation tools.

Objectives

The aim of our study was to assess the behavior of the lumenless lead rotations and the physiological property of the interventricular septum

Methods

Patients undergoing LBBP between January 2021 and December 2022 were retrospectively included in the study.

Results

Among 255 attempted patients, 20 (7.9%) had procedural failure(no LBB capture—four, inability to penetrate septum—seven, and dislodgements after sheath removal—nine). Septal penetration achieved in 248/255 patients (97.2%). Lead movement inside the IVS was assessed by lead traverse time. Based on the behavior of the IVS ($n = 255$), three different responses were noted. Type-I response(normal/firm septum) in 93.7% ($n = 239$) characterized by constant and progressive movement of lead. Neither perforation nor further change in premature-ventricular-complex morphology beyond M-beat were observed despite additional few unintentional rotations indicating the protective

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Madurai Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 00...

Journal of Cardiovascular Electrophysiology / Volume 34, Issue 3 / p. 760-764

BRIEF COMMUNICATION

Predictors of procedural failure of left bundle branch pacing in scarred left ventricle

Shunmuga Sundaram Ponnusamy MD, DM, PDF, CEPS ✉, Mariappan Murugan MD, Vithiya Ganesan MD, Pugazhendhi Vijayaraman MD, FHRS

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Abstract

Introduction

Presence of scar at the implantation-site is considered as a major factor in determining the success of left bundle branch pacing (LBBP). We aimed at analyzing the predictors of procedural failure in patients with scarred-left ventricle (LV) as demonstrated by cardiac-magnetic resonance-imaging (CMR).

Methods

This was a retrospective, observational single-center-study that included consecutive cardiomyopathy patients with LV-scar as demonstrated by late-gadolinium-enhancement (LGE) in CMR requiring LBBP. Procedural-failure was defined as the inability to penetrate the septum to reach the LV subendocardium

Results

A total of 25 cardiomyopathy patients demonstrated LGE in CMR and were included in the study. LBBP was successful in 16 patients (group-I; 64% acute-procedural-success). In the remaining 9 patients (group-II) lead could not be penetrated and hence biventricular-pacing was done. LBBP resulted in reduction in QRS-duration and improvement in LV ejection fraction in group-I patients during a mean follow-up of 11.2 ± 3.7 months. Computed-tomography-angiography after LBBP showed the successful lead deployment site (LBBP-Zone) as the overlapping areas of inferior aspect of antero-septum and superior aspect of infero-septum (segment 2/3; AHA-model) in short-axis view(figure-1C).

Prof. I. THIRUNAVUKKARASU, M.D.,D.A.,
Hospital
and Research Institute
"Volammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625

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Pacing for atrioventricular block with preserved left ventricular function: On-treatment comparison between his bundle, left bundle branch, and right ventricular pacing

Shunmuga Sundaram Ponnusamy [a, *], Pugazhendhi Vijayaraman [b]

[a] Velammal Medical College, Madurai, India
[b] Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes Barre, PA, USA

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1. Introduction

Right ventricular (RV) pacing has been the traditional pacing site for the treatment of symptomatic bradyarrhythmia. RV pacing produces left bundle branch block (LBBB) morphology on the 12-lead electrocardiography (ECG) resulting in dyssynchronous contraction of the left ventricle (LV) similar to that observed in patients with native LBBB [1]. These effects result in myofibrillar disarray, increased fibrosis and reduced LV ejection fraction. Clinically this has translated into frequent heart failure hospitalization, arrhythmias and increased mortality [2].

Three different types of myocardial cells make up the ventricular wall: epicardial, endocardial and M-cells [3]. The depolarization-repolarization process (DRP) differs across the layers and the epicardial cells complete the repolarization process first and the M-cells the last. DRP can be measured on the surface ECG by QT interval which measures both depolarization and repolarization. However, QT interval has to be corrected for heart rate by Bazett's formula as it depends on the length of the previous cardiac cycle. Transmural dispersion of repolarization can be measured by the interval between the peak to the end of T-wave (Tp-Te). Amplification of dispersion of repolarization is a known substrate for ventricular arrhythmias and hence Tp-Te duration can serve as a non-invasive index of arrhythmogenesis [4]. Tp-Te/QTc serves as a more sensitive index as it provides an estimate of dispersion of repolarization relative to the total duration of depolarization eliminating the confounding effects of heart rate [4].

RV pacing results in prolongation of all the markers of depolarization-repolarization process predisposing to ventricular tachyarrhythmias. Lee et al. [5] showed that a prolonged paced QTc interval was independently associated with increase in all-cause mortality (HR 2.08; 95% CI 1.44–3.01; *P* value <0.001). Since RV pacing has its own limitations, conduction system pacing by capturing the His bundle or left bundle has been suggested as an alternative to provide physiological activation of the ventricles and avoid pacing related complications in patients with AV block and normal LV function [6–11]. The repolarization and depolarization parameters were not studied before in patients with AV block with preserved LV function undergoing LBBP and HBP where the pacing requirement would be more than 40%.

1.1. Aim

To compare the electrocardiographic, depolarization-repolarization parameters and clinical outcomes of patients with AV block with preserved left ventricular (LV) function who had undergone conventional RV pacing (RVP), His bundle pacing (HBP) and left bundle branch pacing (LBBP) and completed at least one year follow-up.

Abbreviations: RVP, right ventricular pacing; HBP, his bundle pacing; LBBP, left bundle branch pacing; AVB, atrio-ventricular block; CRT, cardiac resynchronization therapy; LVEF, left ventricular ejection fraction.

* Corresponding author. Department of Cardiology, Velammal Medical college hospital and research institute, Madurai, Tamilnadu, India.
E-mail address: shunmuga.pgi@gmail.com (S.S. Ponnusamy).

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Prof. T. THIRUNAVUKKARASU, M.D.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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BRIEF COMMUNICATIONS

Right sided approach for left bundle branch pacing using lumen-less lead: Technical considerations and follow-up outcome

Shunmuga Sundaram Ponnusamy MD, DM, PDF, CEPS ✉, Vithiya Ganesan MD, Vadivelu Ramalingam MD, DM, Mahesh Kumar MD, DM, PDF ... See all authors

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Abstract

Introduction

Left bundle branch pacing has gained significant momentum in the last few years. The procedure involves deploying the lead deep inside the interventricular septum through left subclavian vein. We aimed at analyzing the feasibility, efficacy and long-term outcome of left bundle branch pacing (LBBP) using lumen-less lead through the right subclavian vein.

Methods

This was a retrospective-institutional, single center observational study done in consecutive patients who underwent LBBP using 3830 selectsecure^{tm} lead. Left subclavian venous access was the primary strategy for lead implantation. Patients requiring right sided approach due to venous obstruction or persistent left superior-vena-cava (PLSVC) for LBBP were included in the study.

Results

Right sided approach was successful in 16 out of 19 (84%) attempted patients. C315-His catheter was used in all patients without modifying its curvature. PLSVC ($n = 7$), left venous obstruction ($n = 7$), right sided device upgradation ($n = 1$) and left pocket infection ($n = 1$) were the reasons for right sided approach. Mean follow-up duration was 17 ± 12 months. LBBP resulted in reduction in QRS duration from 137.3 ± 37.8 ms to 122.3 ± 9.5 ms (p −.13) and increase in LV ejection fraction from 46.2 ± 16.3% to 54.4 ± 11.6% (p −.11).

Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

MAgnetic resonance imaging based DUal lead cardiac Resynchronization therapy: A prospectIve Left Bundle Branch Pacing study (MADURAI LBBP study)

Check for updates

Shunmuga Sundaram Ponnusamy, MD, DM, CEPS-A,* Vidhya Ganesan, MD,† Vadivelu Ramalingam, MD, DM,* Thabish Syed, MBBS, DNB,* Selvaganesh Mariappan, MD, DM,* Senthil Murugan, MD, DNB,* Mahesh Kumar, MD, DM,* Vijesh Anand, MD, DNB,* Mariappan Murugan, MD,‡ Pugazhendhi Vijayaraman, MD, FHRS§

*From the *Department of Cardiology, Velammal Medical College, Madurai, India, †Department of Microbiology, Velammal Medical College, Madurai, India, ‡Department of Radiodiagnosis, Velammal Medical College, Madurai, India, and §Geisinger Heart Institute, Geisinger Commonwealth School of Medicine, Wilkes Barre, Pennsylvania.*

BACKGROUND Cardiac resynchronization therapy (CRT) is a class I indication for left ventricular ejection fraction (LVEF) ≤35% and heart failure (HF). Left bundle branch block (LBBB)–associated nonischemic cardiomyopathy (LB-NICM) with minimal or no scar by cardiac magnetic resonance (CMR) imaging may be associated with excellent prognosis following CRT. Left bundle branch pacing (LBBP) can achieve excellent resynchronization in LBBB patients.

OBJECTIVES The purpose of this study was to prospectively assess the feasibility and efficacy of LBBP with or without a defibrillator in patients with LB-NICM and LVEF ≤35%, risk stratified by CMR.

METHODS Patients with LB-NICM, LVEF ≤35%, and HF were prospectively enrolled from 2019 to 2022. If the scar burden was <10% by CMR then LBBP only (group I) and if ≥10% then LBBP + implantable cardioverter-defibrillator (ICD) (group II) was performed. Primary endpoints were (1) echocardiographic response (ER) [ΔLVEF ≥15%] at 6 months; and (2) composite of time to death, heart failure hospitalization (HFH), or sustained ventricular tachycardia (VT)/ventricular fibrillation (VF). Secondary endpoints were (1) echocardiographic hyperresponse (EHR) [LVEF ≥50% or ΔLVEF ≥20%] at 6 and 12 months; and (2) indication for ICD upgrade [persistent LVEF <35% at 12 months or sustained VT/VF].

RESULTS One hundred twenty patients were enrolled. CMR showed <10% scar burden in 109 patients (90.8%). Four patients opted for LBBP+ICD and withdrew. LBBP-optimized dual-chamber pacemaker (LOT-DDD-P) was performed in 101 patients and LOT-CRT-P in 4 patients (group I; n = 105). Eleven patients with scar burden ≥10% underwent LBBP+ICD (group II). During mean-follow-up of 21 ± 12 months, the primary endpoint of ER was observed in 80% (68/85 patients) in group I vs 27% (3/11 patients) in group II ($P = .0001$). Primary composite endpoint of death, HFH, or VT/VF occurred in 3.8% in group I vs 33.3% in group II ($P < .0001$). Secondary endpoint of EHR (LVEF≥50%) was observed in 39.5% vs 0%, 61.2% vs 9.1%, and 80% vs 33.3% at 3, 6, and 12 months in groups I and II, respectively.

CONCLUSION CMR-guided CRT using LOT-DDD-P seems to be a safe and feasible approach in LB-NICM and has the potential to reduce health care costs.

KEYWORDS Heart failure; Late gadolinium enhancement; Left bundle branch block; Left bundle branch pacing; LOT-CRT; LOT-DDD-P; LOT-ICD

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Introduction

Cardiac resynchronization therapy (CRT) by biventricular pacing (BVP) remains the standard therapy for patients having heart failure (HF) with reduced ejection fraction (EF) and wide QRS duration on optimal medical management.[1–6] Some patients, referred to as "superresponders," may have normalized left ventricular (LV) function after BVP.[7,8] Although the implantable cardioverter-defibrillator (ICD) is a class I recommendation for patients with HF and reduced LVEF.[9] the evidence is much stronger for ischemic cardiomyopathy than for patients with nonischemic cardiomyopathy (NICM).[10] In patients with left bundle branch block (LBBB)–associated NICM, conduction abnormality resulting in delayed activation of the LV might be the etiology for cardiomyopathy. The majority of these patients have persistent symptoms despite 3 months of guideline-directed medical therapy and remain CRT candidates.[11,12]

Address reprint requests and correspondence: Dr Shunmuga Sundaram Ponnusamy, Department of Cardiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamilnadu, India 625009. E-mail address: shunmuga.pgi@gmail.com.

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Prof. T. THIRUNAVUKKARASU, M.D.(A.M.),
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
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Abstract

Purpose of Review

As the percentage of patients achieving long-term survival following treatment of their cancer grows, it is increasingly important to understand the long-term toxicities of cancer-directed treatment. In this review, we highlight the recent findings regarding radiation-induced cardiotoxicity across multiple disease sites, with a particular focus on heart failure.

Recent Findings

Despite its relative lack of study historically, radiation-induced heart failure has now recently been implicated in several studies of breast cancer, lung cancer, esophageal

Prof. T. THIRUNAVUKKARASU, M.D., D.M.
Veterinary College Hospital and Research Institute
Veterinary University
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

cancer, and lymphoma as a non-trivial potential consequence of thoracic radiotherapy. Data regarding specific cardiac dosimetric endpoints relevant to cardiotoxicity continue to accumulate.

Summary

Radiation-induced heart failure is a rare but significant toxicity of thoracic radiotherapy, that is likely underreported. Important areas for future focus include understanding the interplay between thoracic radiotherapy and concurrent cardiotoxic systemic therapy as well as development of potential mitigation strategies and novel therapeutics.

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Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 0[illegible]N.

Review Article

Approach to Left Bundle Branch Pacing

Katta, Maanya Rajasree MBBS*; Abouzid, Mohamed Riad Abdelgawad MBBS†; Hameed, Maha MBBS‡; Kaur, Jasneet MBBS§; Balasubramanian, Suryakumar MBBS¶

Author Information

From the *University of La Verne, La Verne, CA

†Baptist Hospitals of Southeast Texas, TX

‡Clinical Research Department, King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia

§Government Medical College, Amritsar, India

¶Velammal Medical College and Research Institute, Madurai, India.

Disclosure: The authors have no conflicts of interest to report.

All authors contributed, reviewed, and edited the manuscript.

The authors declare that data supporting the findings of this study are available within the article.

Correspondence: Maha Hameed, MBBS, King Faisal Specialist Hospital & Research Centre (KFSH&RC), Clinical Research Department, Al Mathar Ash Shamali, Riyadh, Saudi Arabia, 11564. E-mail: mwhameed2016@gmail.com.

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Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625

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Metrics

Abstract

Cardiac pacing refers to the implantation tool serving as a treatment modality for various indications, the most common of which is symptomatic bradyarrhythmia. Left bundle branch pacing has been noted in the literature to be safer than biventricular pacing or His-bundle pacing in patients with left bundle branch block (LBBB) and heart failure, thereby becoming the focus of further research on cardiac pacing. A review of the literature was conducted using a combination of keywords, including "Left Bundle Branch Block," "Procedural techniques," "Left Bundle Capture," and "Complications." The following factors have been investigated as key criteria for direct capture: paced QRS morphology, peak left ventricular activation time, left bundle potential, nonselective and selective left bundle capture, and programmed deep septal stimulation protocol. In addition, complications of LBBP, inclusive of septal perforation, thromboembolism, right bundle branch injury, septal artery injury, lead dislodgement, lead fracture, and lead extraction, have also been elaborated on. Despite clinical implications based on clinical research comparing the use of LBBP with other forms such as right ventricular apex pacing, His-bundle pacing, biventricular pacing, and left ventricular septal pacing, a paucity in the literature on long-term effects and efficacy has been noted. LBBP can thus be considered to have a promising future in patients requiring cardiac pacing, assuming that additional research on clinical outcomes and the limitation of significant complications such as thromboembolism can be established.

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Prof. T. THIRUNAVUKKARASU, M.S.
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

Crateriform Papules on Penis

Dear Editor,

A 28-year-old married male presented to our outpatient department with complaints of raised skin lesions over the genital region for the past 2 months. It was associated with occasional itching. There was no history of promiscuity. On examination, there were three pigmented crateriform papules of varying sizes over the inner aspect of the prepuce [Figure 1]. The papules were smooth and soft on palpation. Serology for syphilis and the human immunodeficiency virus types 1 and 2 were both nonreactive. The clinical differential diagnosis includes molluscum contagiosum, human papillomavirus (HPV) warts, bowenoid papulosis, ectopic sebaceous glands, and genital porokeratosis.

Dermoscopy showed some aggregated white or yellow nodules within the crater and a linear vessel in the periphery [Figure 2]. On histopathological examination, the epidermis showed surface indentation which corresponds clinically with the central crater. There was an expansion of the normal lobular sebaceous gland with mature sebocytes and a peripheral germinative layer in the superficial dermis. Few lobules communicate with surface epithelium through the common duct with mild interstitial mixed inflammatory infiltration. Cellular atypia was not seen [Figure 3]. The histopathological differential diagnosis considered were sebaceous hyperplasia, sebaceous adenoma, and Fordyce spots. The differences among these were shown in Table 1.



Figure 1: Multiple pigmented crateriform papules over inner aspect of prepuce

As our case had numerous lobules opening through a common duct, a diagnosis of sebaceous hyperplasia (SH) was made. As the patient was cosmetically concerned, cryotherapy was done.

Sebaceous glands form part of the skin appendages and are present in large numbers on the face, scalp, and ears in association with hair structures. Free sebaceous glands (those not associated with the hair follicle) are occasionally found in some areas of modified skin, such as the nipple (Montgomery tubercles), lips (Fordyce's spots), and the inner surface of the prepuce (Tyson's glands).[1]

Sebaceous glands can be seen in the oral mucosa or genitalia in adults as ectopic glands or "Fordyce spots," though it is not a common area to be found. SH is a benign increase in the size of the sebaceous lobule surrounding the follicular infundibulum; so, it usually appears in hairy areas. It affects adults of middle age or older, mainly in the face and other actinic damaged areas.

Table 1: The difference between sebaceous hyperplasia, Fordyce spots, and sebaceous adenoma

Sebaceous hyperplasia	Fordyce spots	Sebaceous adenoma
Sebaceous glands are composed of numerous lobules grouped around a centrally located sebaceous duct	Mature sebaceous lobules are situated around a small sebaceous duct leading to the surface epithelium	Incompletely differentiated sebaceous lobules that are irregular in size and shape. Both basaloid and sebaceous cells were seen. Cytological atypia absent

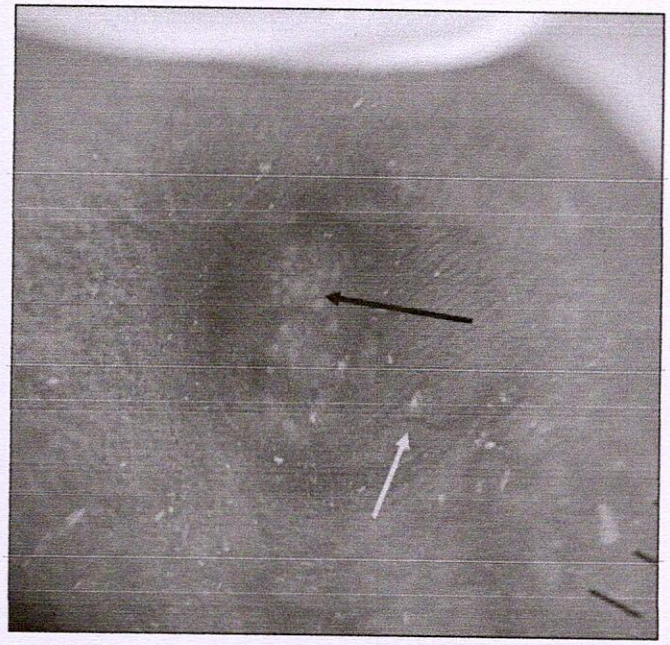


Figure 2: Dermoscopy shows yellow and white nodules (black arrow) and non branching linear vessel (yellow arrow) (Dermlite 4, polarising mode, 10x)

Prof. T. THIRUNAVUKKARASU, M.S., M.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

Pinch Purpura in Adult Colloid Milium—A Case Report

Abstract

Colloid milium is a rare cutaneous deposition disorder characterized by the presence of asymptomatic multiple dome-shaped semi-translucent waxy yellowish or skin-colored papules. It is commonly seen on the face and dorsum of forearms and arms due to chronic sun exposure. Nodular amyloidosis and primary systemic amyloidosis mimic adult colloid milium more closely. They share indistinguishable common features clinically and histologically. Purpura following trivial injury is a cardinal feature of primary systemic amyloidosis. Here, we are reporting a case of adult colloid milium, presented with waxy papules and purpura involving the dorsa of the lower half of the forearms and hands which is confirmed by histopathological and immunohistochemical studies.

Keywords: *Colloid, pinch purpura, primary systemic amyloidosis*

Krishnaram AS, Geetha T[1], SriRam CK, Shibani MI, Sri Krishna Priya

Departments of Dermatology, Venereology and Leprology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, [1]Pathology, Madurai Medical College, Madurai, Tamil Nadu, India

Introduction

Colloid milium is a rare cutaneous deposition disorder characterized by the presence of asymptomatic multiple dome-shaped semi-translucent waxy yellowish or skin-colored papules ranging in size from 1 to 4 mm.[1,2] The underlying skin may be thickened and may show furrows. It manifests over the face and dorsum of forearms and arms due to chronic sun exposure. It has been classified into four different types namely, 1) juvenile type originating from degenerating keratinocytes, 2) adult type from degenerating elastic fibers, 3) pigmented type due to toxic effects of petroleum products and hydroquinone, and 4) nodular colloid occurring in old age. Here we report a rare case of adult colloid milium with purpura as an unusual presentation.

Case Report

A 35-year-old fair complexioned male was examined in a skin outpatient department for asymptomatic non-progressive symmetrical skin lesions over the forearm and hands for an eight-year duration. A history of trauma-induced purpura was present over lesion sites. There were no systemic complaints and no family history of similar illnesses. The patient is a financier by occupation with a moderate degree of exposure to sunlight. Topical application with sunscreens and emollients showing no improvement.

Dermatological examination revealed bilateral symmetrical numerous skin-colored to yellowish waxy papules involving the dorsa of the lower half of the forearms and hands [Figure 1]. Purpura was observed over the waxy papules and could be induced selectively over the lesion areas by stroking [Figure 1]. Face, mucosa, and tongue were normal. Systemic examinations were normal. Basic investigations, complete hemograms, coagulation profiles, serum proteins, and immunoglobulin assays were normal. X-ray of the chest and ultrasound abdomen was also normal.

Biopsy from the waxy purpuric papules under hematoxylin and eosin showed a homogenous globular eosinophilic mass with cleft-like spaces in the papillary dermis. A grenz zone separated the thinned-out epidermis from the homogenous mass [Figure 2]. Fibroblasts, numerous red blood corpuscles, and damaged blood vessels were also appreciable within and adjacent to the mass [Figure 2]. The deeper dermis and subcutis were normal. Special staining with Congo red was negative and Verhoff-von Gieson (VVG) staining revealed strong black degenerated elastic fibers (solar elastosis) beneath the mass and upper

Address for correspondence:
Prof. Krishnaram AS, Department of Dermatology, Venereology and Leprosy, No. 2A, Kauvery Block, Velammal Medical College Hospital and Research Institute, Madurai-Tuticorin Ring Road, Annuppandi, Madurai - 625 009, Tamil Nadu, India.
E-mail: ask4367@gmail.com

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Prof. T. THIRUNAVUKKARASU, M.S., M.Ch.
Dean
Velammal Medical College Hospital and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

Two Sporadic Cases of Haber's Syndrome: First Case Report from India

Krishnaram A. Subburaman, Sriram CK, Shibani MI, Srikrishnapriya M

From the Department of Dermatology, Venereology and Leprology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India
E-mail: cksriram49@gmail.com

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Sir,

Haber's syndrome is characterized by rosacea-like features and widespread verrucous keratotic lesions.[1] Only 15 cases from eight families have been described to date.[2] Here we report two sporadic cases of Haber's syndrome from India with new additional interesting features.

First case, a 28-year-old female presented with facial erythema and widespread dark-pigmented warty lesions. Born of a consanguineous marriage, no other family member was affected. She had persistent facial flushing and burning sensation over the face since childhood, starting at the age of 12 years. Onset of the warty lesions followed rosacea-like features and these warty lesions gradually increased in size and number over time. On examination, numerous pigmented verrucous plaques, clinically suggesting seborrheic keratosis (SK) were of varying sizes, ranging from 0.5 cm to 2 cm; present mostly over the trunk and extremities and few lesions were also seen over face. Extensive reticulate pigmentation was seen on the back and neck. These SKs had a unique appearance, they resembled starfish due to the extension of the verrucous plaque to the periphery of the lesion in a reticulate pattern. Face was flushed and telangiectasia was observed over neck [Figure 1].

Second case, a 45-year-old female came to our outpatient department with profuse black warty lesions all over her body. These lesions were slowly progressive, enlarged, and became widespread since their first appearance during adolescence. Family history was unremarkable. The patient denied any history of flushing or burning sensation of face. Numerous discrete pigmented verrucous plaques resembling SK of size ranging from 0.2 cm to 5 cm were observed over the face, neck, trunk, and all extremities. These SKs were distinct in appearance. They had a similar starfish appearance with irregular borders. Also, diffuse reticulate pigmentation was noted all over the body with SK extending into these [Figure 2]. Diffuse thickening of both the palms with few warty and keratotic plaques over the palms and fingers was noted [Figure 3]. Oral cavity examination revealed pigmentation of lips and lichen planus of the tongue [Figure 4]. Nails were dystrophic and alopecia was noted. As both of our patients were denied, the biopsy was not done.

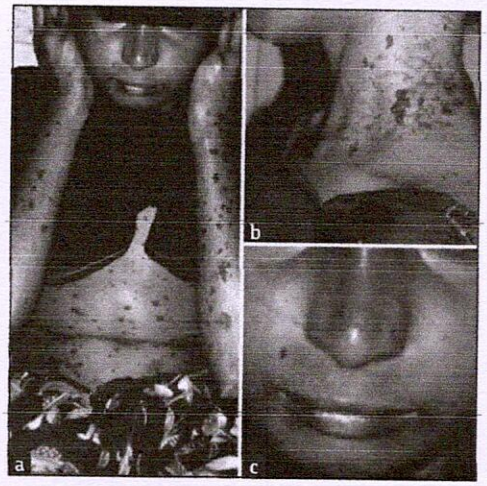


Figure 1: (a) Multiple pigmented verrucous plaques seen over the trunk, extremities, and face (b) Pigmented plaques with reticulate pigmentation seen on the neck (c) Rosacea-like lesions over face

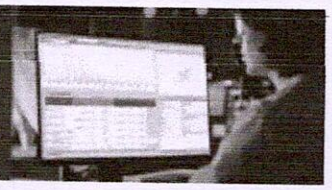
Haber's syndrome is a rare genodermatosis with an autosomal dominant pattern of inheritance. It was first described in 1965 by Sanderson and Wilson.[1] The histological features were described by Henry Haber, the syndrome was named after him. In their case report, three patients were noted to have a persistent rosacea-like eruption of the face and a tendency to develop intraepidermal epitheliomata on the covered parts.[2] Other clinical features of Haber's syndrome include erythema, telangiectasia, enlarged follicular orifices, comedones, follicular papules with scaling and pitted scars.[3] Palmoplantar keratoderma, prominent cuticles, and ichthyosis of lower limbs have been observed in subsequent case reports.[4,5] Bowen's disease and squamous cell carcinoma have been reported in two cases of Haber's syndrome.[6]

Dowling–Degos disease (DDD), Acropigmentation of Kitamura, and Haber's syndrome are considered to be different clinical expressions of a spectrum of diseases. A similar histopathological picture of epidermal budding and extensive proliferation of follicular walls is considered to be the unifying characteristic of these conditions.[7]

Haber's syndrome rosacea-like eruption occurs early during adolescence. Our first patient typically gave a history of rosacea-like eruption. The morphological pattern of reticulate pigmentation and SK observed in both cases is characteristic of Haber's syndrome. The course of these SK is progressive during the childhood and relatively static over the adulthood. In the second

Prof. T. THIRUNAVUKKARASU, M.D., D.V.L.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625 009, T.N.

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Correspondence

Diffuse cutaneous plasmacytosis masquerading as leonine facies with novel dermoscopic findings

A. S. Krishnaram MD, DD ✉, Sriram CK MD, Aravind Sivakumar MD, DNB

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Prof. T. THIRUNAVUKKARASU, M.D.,D.A.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin
Anuppanadi, Madurai

An Uncommon Species of Phaeohyphomycosis—A Rare Case Report of *Rhytidhysteron Rufulum*

Dear Editor,

Dematiaceous fungi are a group of fungi whose cell wall contains melanin complex and appear brown on microscopy. Based on histological findings, the infection patterns are grouped into chromoblastomycosis, phaeohyphomycosis, and eumycotic mycetoma. Phaeohyphomycosis is a broad term used for all mycoses, where the melanized fungal elements are present in host tissues caused by *Fonsecaea, Exophiala, Cladophialophora*, etc.[1] Phaeohyphomycosis involves the skin and subcutaneous tissue and disseminated infection can also occur in immunocompromised patients. Here, we report a case of subcutaneous phaeohyphomycosis in an old treated Hansen's disease due to the rarity of the etiological agent. This is the first case report of subcutaneous phaeohyphomycosis caused by *Rhytidhysteron rufulum* in Tamil Nadu. *Rhytidhysteron rufulum* is a fungus of dead or decaying plant tissues and rarely infects humans.

A 60-year-old nondiabetic male was admitted for the treatment of a trophic ulcer and complained of pain from swelling over his left knee. He had developed this swelling 3 years ago, which progressively increased in size to attain the present size. He could not recall any history of accidental trauma or thorn prick. There was no history of similar lesions elsewhere in the body. He was a known case of old-treated Hansen's disease, and had completed successful treatment of multibacillary multidrug therapy (MB-MDT) 12 years ago. Blood counts and other biochemical parameters were within normal range, and he was seronegative for human immunodeficiency virus. Clinical examination revealed a single cystic swelling of size 5 × 5 cm in the anterior aspect of the left knee joint [Figure 1a and b]. There was a purulent aspiration obtained from the swelling. The aspirate was subjected to 10% KOH examination, Gram stain, and bacterial and fungal cultures. Gram staining did not reveal any bacteria, and the bacterial culture was negative. KOH mount showed pigmented septate and thick-walled hyphae [Figure 2]. Grayish-white colonies were observed after one week of incubation on Sabouraud's dextrose agar (SDA). On further incubation, the colonies turned grayish black, and black pigment was seen on the reverse [Figure 3a and b]. Lactophenol cotton blue tease mount showed thick, brown septate hyphae without any fruiting bodies [Figure 3c]. Excision in toto was done, and the patient was started on itraconazole 200 mg twice daily (BD). Histopathology showed pigmented septate hyphae in the dermis, and was confirmed by Gomori's methenamine and silver staining [Figure 4a and b]. At 6-month follow-up, there was no recurrence of the lesion at the site. The isolate was submitted to Advanced Molecular and Diagnostic Research Centre for fungi (AMDRC), All India Institute of Medical Sciences, Bhubaneshwar. At AMDRC, the isolate was grown in Sabouraud's dextrose broth for 15 days and DNA was extracted from a fungal ball using the phenol-chloroform isoamyl alcohol method. DNA obtained was subjected to PCR (Polymerase chain reaction) using the ITS4 and ITS5 primers and sequencing as described previously.

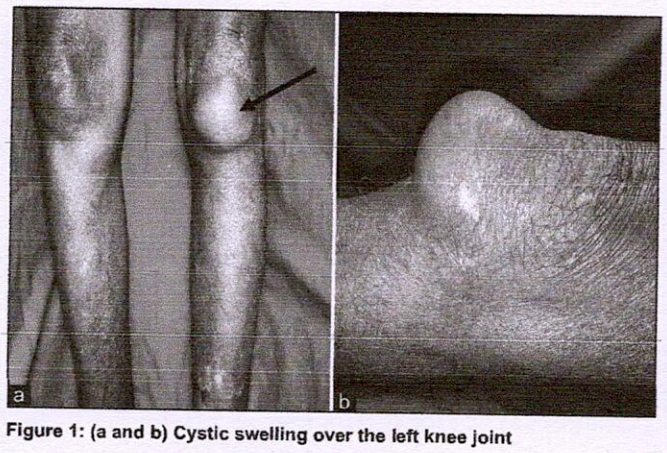


Figure 1: (a and b) Cystic swelling over the left knee joint

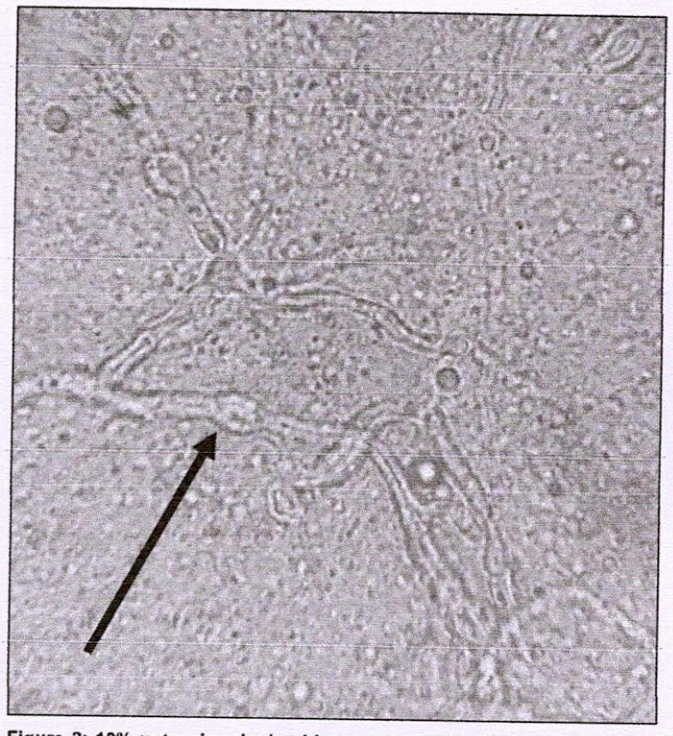


Figure 2: 10% potassium hydroxide mount showing pigmented, septate hyphae (40x)

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Prof. T. THIRUNAVUKKARASU, M.S.,
Dean
Velammal Medical College Hospital
and Research Institute
"Velammal Village"
Madurai-Tuticorin Ring Road
Anuppanadi, Madurai-625