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FMJ invites submissions of original papers and reviews on all aspects of health. Any health worker who actively participates in the process of providing medical education, medical care and primary care services should consider contributing to the FMJ. Manuscripts are accepted for publication only with the understanding that they have not been published or submitted for publication elsewhere. Priority will be given to articles and subjects relevant to health and health practices in the Pacific. All manuscripts will be peer reviewed before being accepted for publication.

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Editorials:
Comments from the editors on the contents and issues covered by the Journal. Invited editorials may be published in line with themed issues or on topics of current relevance.

Original Articles:
Reports of original and new investigations or contributions. Text preferably to be a maximum of 3000 words.

Brief Communications and Case Reports:
Contents similar to that of original articles but text should be no more than 1500 words. These may include articles on various aspects of health, such as current health issue at regional or international level, services, awareness, etc.

Reviews:
Critical analysis of previously collected and published information. Text to be a maximum of 3000 words. Ideally such articles would come from contributors who command an authority on the subject.

Viewpoints, Opinions, & Perspectives:
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Letters:
Short reports of clinical experience, topics of interest, or comments on previous articles. Text to be around 500 words.

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These are informed reviews of around 1500 words of books pertinent to health.

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These will be brief announcements about regional organizations' activities, news and information.

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Communication

MESSAGE FROM THE HONOURABLE MINISTER OF HEALTH & MEDICAL SERVICES

Ifereimi Waqainabete
Minister of Health and Medical Services, Fiji Islands

Dear Brothers and Sisters of the Medical Profession.

I am pleased to share a few thoughts on our FMJ.

My new role as Minister for Health & Medical Services is a great responsibility entrusted upon me by the Honourable Prime Minister on behalf of the nation.

I must mention that the political campaign was an opportunity to visit a cross section of society in urban and rural areas and experience firsthand their day to day lives as a normal citizen and political candidate. During this period the public were very candid and honest in their deliberation.

I thank God for His Mandate that we Fiji First won and form Government with our Leader as the Honourable Prime Minister.

The MHMS is a big ministry with big expectations. Also, it has its own challenges.

I am pleased to be back amongst colleagues though in the Ministers role, and realize that I must defend Fiji and its people. I have sworn allegiance to protect our constitution and the rule of Law.

I hope that you will understand all the decisions made whether big or small are made with Fiji and its people at the heart of it.

God Bless you

Report

REPORT ON THE FIJI MEDICAL ASSOCIATION ANNUAL SCIENTIFIC CONFERENCE

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The theme of the Diamond Jubilee Year of the Fiji Medical Associations Annual Scientific Conference was '**Making Medicine Safe**'. In the usual fashion, the conference kick-started with preconference workshops on the afternoon before the official opening.

This year we had 3 workshops which were:

1. Emergency Obstetrics – Lead by the OBGYN team from CWMH, looking at obstetrical emergencies seen at maternity centres around the country and how to best manage them.

2. Trauma 101 – Lead by the young vibrant couple Dr Dennis and Elizabeth Lee, who introduced a thumb-stimulating, teaching-innovative method of teaching using your smart phone and internet connection to answer questions in real time as the teaching process was being conducted

3. Longevity lifestyle matters – Presented by brain function specialist Dr Arlene Taylor, talking to doctors about the importance of taking care of ourselves using important lifestyle habits.

The opening of the conference was officiated by the Permanent Secretary for Civil Service who again renewed her support for doctors and the improvement of the medical profession, in ensuring that Medicine is safe for doctors and medical staff as well as the public that we serve.

The Keynote address was made by the President of the International Surgical Society, a Kiwi Surgeon and obvious All Blacks supporter, Professor Andrew Hill. Professor Hill spoke on mindfulness and how it is important for doctors to realize that even the All Blacks lose a match every now and then but the key is that they learn from their mistakes and continue to be positive and strive for excellence but they too take care of themselves first.

Dr Dianne Stephens spoke on what the world is doing to make medicine safe and she used examples from the world as well as from the Aussies and she also shed light on the fact that doctors need to take time out for themselves also.

Time was also given to our Platinum sponsors the ANZ bank who spoke to us on the importance of our financial well-being, to ensure that every doctor is financially healthy before they go out and treat patients who are physically unhealthy.

Another highlight of the opening day were the research presentations by three of our Masters graduates; Dr Nitik Ram, Dr Pablo Romakin and Dr Maryanne Kora'ai. Dr Maryanne took out the award for the most outstanding research presentation, which was awarded to her the next day.

On Saturday morning, we were addressed by the honourable Minister for Health and Medical Services, Mrs Rosy Akbar who updated us from the Health ministry's side. She spoke on many different subjects and reaffirmed her support for the Medical Profession.

We also had the pleasure of hearing from the Australian High Commissioner, Mr John Feakes, who spoke on how the Australian Government is supporting Health systems in Fiji and the Pacific.

Later in the day we had presentations from various doctors about how to improve the medical system. We also heard from Ms Suzanne Hill from a Radiology training program as she spoke to us about the progress of postgraduate training in Radiology. The day ended with some very controversial discussions from the office of the Solicitor General, some of which we FMA still needs to address.

Next year's conference will be focused on graduating classes and we encourage everyone to organize a mini reunion at the 61st FMA conference.

Attendees of the FMA 60th Annual Scientific Conference
Held at the Pearl South Pacific Resort, 6th to 9th September 2018

Original Article

INCIDENCE, TYPES, MANAGEMENT AND OUTCOMES OF CONGENITAL HEART DISEASE IN THE PAEDIATRIC POPULATION AT COLONIAL WAR MEMORIAL HOSPITAL, FIJI – FROM JANUARY 2012 TO DECEMBER 2016

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ABSTRACT

Introduction:
Congenital Heart Disease (CHD) refers to structural or functional heart disease present at birth. CHD continues to cause morbidity and mortality in Fiji. There is no published data on CHD in the Pacific in the last 15 years. Unpublished data by Mataika. R, 2012 (12) estimated the incidence of CHD at Colonial War Memorial Hospital (CWMH) was ~ 0.5% or 4.9/1000 live births. This study aims to collect and document data on the incidence, types, management and outcomes of CHD, a platform upon which decisions for policy and practice development for CHD screening and management in Fiji can be made.

Method: This is a five-year descriptive, retrospective, single-centre study at CWMH.

Results:
The incidence of CHD was 5.8 per 1,000 with an uncorrected incidence of 7.2 per 1,000. Ventricular Septal defects (VSD) and Tetralogy of Fallot (TOF) were the most common acyanotic and cyanotic lesions respectively. The total number of cases of CHDs was 202 and 76 (39%) died within that period. Ninety-five percent of the deaths occurred within the first year of life. Sixty-five percent of these infant mortalities were known acyanotic CHD cases. Forty-six (23%) cases had corrective surgeries. Survival rate for surgery locally was 98%, compared to 100% for those cases that had surgery abroad.

Conclusion:
This study highlights the mortality associated with congenital heart diseases in Fiji and the need for strengthening of surgical management strategies.

Key Words: *Congenital Heart Disease, incidence, outcomes, mortality*

INTRODUCTION

Background Knowledge

Congenital Heart Disease (CHD) refers to structural or functional heart disease present at birth [1]. The aetiology may be multi-factorial; due to a single gene or chromosomal gene mutation, exposure to teratogen, environmental factors or idiopathic [2]. CHD occurs in nearly 1% of live births and is estimated to be the cause of 10% of spontaneous abortions [1]. In developed countries, foetal anomaly scan including a screening heart ulaatrasound is routinely done at 18 weeks of gestation [3] and if CHD is identified, the parents are counselled, and

corrective surgery offered in-utero or soon after birth if needed.

Screening for critical CHD continues in the early postnatal period with the use the pulse oximetry. Critical CHDs depend on the patency of the ductus arteriosus and urgent surgery during neonatal period [4]. The critical CHDs are Hypoplastic Left Heart Syndrome (HLHS), Pulmonary Atresia (with intact septum), TOF, Total Anomalous Pulmonary Venous Return (TAPVR), Transposition of the Great Arteries (TGA), Tricuspid Atresia (TA) and Truncus Arteriosus [4]. The critical CHD may go unnoticed clinically if not oximetry is not used [5].

Transthoracic and transoesophageal echocardiography are the gold standard for diagnosing CHD in children but require highly skilled personnel. Despite advances made in the diagnosis and treatment of CHD, it remains the leading non-infectious cause of death in infancy in the developing countries like Fiji.

In Fiji, with a population of about 900,000 and annual birth cohort of about 20,000, it is estimated that there are about 200 children born with CHD each year, however, there is no foetal screening or routine postnatal screening done for critical CHD. Children are referred for an echocardiogram if CHD is suspected clinically. Symptoms include cyanosis, persistent tachycardia or tachypnoea, murmurs, or if they appear syndromic.

Fiji consists of 322 islands. Eighty-seven percent of the population live on the two largest islands of Viti Levu and Vanua Levu. The main ethnic groups are i-Taukei and Fijians of Indian descent (FoI). [5]. The public health service in Fiji is divided into 4 divisions, with three divisional hospitals, CWMH in Suva, Lautoka hospital (Viti Levu) and Labasa hospital. (Vanua Levu) There are 17 sub-divisional hospitals, 80 health centres and 96 nursing stations situated across the nation. This is supplemented by three private hospitals and an increasing number of privately owned clinics operated by general practitioners.

Referrals for echocardiograms for suspected CHD are made from all levels of the health service, the school health team and from general practitioners.

Transthoracic echocardiography is the standard diagnostic investigation for confirming CHD at CWMH. Fiji has only one overseas-trained person. There are few paediatric registrars who are able to conduct screening echocardiograms on children with suspected CHD.

Children with high risk and critical CHD are referred to overseas paediatric cardiothoracic centres depending on availability of funding, while children with non-urgent, low risk cardiac lesions await the fly-in-fly-out (FIFO) cardiac teams and surgery performed locally.

Currently, three FIFO cardiac-surgical teams visit Fiji annually to perform specialist consultations and offer cardiac surgery to children with CHD. These include Open Heart International (Australia), Hearts4Kids / Friends of Fiji (New Zealand), and the Sri Sathya Sai Sanjeevani Hospital (India) team. Each team performs about twenty open heart surgeries per visit with the support from MOH, Adventist Health, Fiji Children's Heart Foundation, Sai Prema Foundation, Fiji, Corona Worldwide, Fiji Branch and other NGOs.

STATEMENT OF THE PROBLEM

CHD continues to contribute to morbidity and mortality and causes economic burden in Fiji. Children die or are admitted repeatedly for complications associated with CHD. There is lack of data on the incidence, types, management and outcome of CHD in the children at CWMH.

There is a need for data on CHD to assist in planning for the future. This study aims to collect data on the

incidence; types, management and outcomes of CHD thus creating a platform on which decisions can be made regarding the way forward for screening and management of children with CHD in Fiji

AIMS & OBJECTIVES

Aim:

To identify the incidence, types, management and outcomes of CHD in the Paediatric population at CWMH from 1st of January 2012 to 31st of December 2016.

Objectives:

- To determine the incidence of CHD in children at the CWMH.
- To identify the most common types of CHD in the children at CWMH.
- To determine the basic medical (medications) and surgical management of the children at CWMH.
- To determine the outcome (associated complications, prognosis 6 months post-surgery and further prognosticate) of children with CHD at CWMH.
- To establish and document the baseline data of CHD in the children at CWMH.

REVIEW OF LITERATURE

CHD is the most common congenital abnormality found in humans. These cardiovascular anomalies are common birth defects and a leading cause of infant mortality, morbidity and economic burden [7].

The reported incidence of CHD is about 1% according to reports from several studies from different parts of the world [2,5,6,7,8]. It is believed that this incidence has remained constant, worldwide. Nearly one third to a half of these CHD cases are critical, requiring intervention in the first year of life. Almost one third of congenital heart abnormalities are ventricular septal defects (VSDs), but atrial septal defects (ASDs), pulmonary valve stenosis (PS), and combined defects of atrial and ventricular septum or TOF are not uncommon [8].

Heart failure (HF) secondary to CHD is a clinical syndrome, which can also be confused with non-cardiac causes. The aetiology of HF differs greatly between children and adults. Congestive HF in children with CHD is usually not caused by pump dysfunction, but is characterized by hemodynamic disturbances due to left-to-right shunts, pulmonary over-circulation, and volume overload causing pulmonary oedema, manifesting as increased respiratory effort and tachypnoea, recurrent pneumonia, poor feeding or even generalized oedema or hydrops fetalis [9].

CHD can present as HF in the first week of life in duct dependent lesions. Few other CHDs may present around 6-8 weeks of life or around two years of life when the pulmonary pressures further decreases. Others may remain asymptomatic until adulthood. [5]

Medical management of CHD varies depending on the type of lesion. Prostaglandin infusion is used in a duct dependent lesion. Propranolol reduce risk of cyanotic spells in TOF patients and varies types of anti-failures can be used for CHD patients with HF. [5]

Diuretics, calcium channel blockers, beta blockers and less commonly the digitalis are used worldwide and in Fiji. Diuretics are the first line of therapy for diastolic dysfunction. Diuretics reduce pulmonary congestion and relieve symptoms such as orthopnoea, cough and dyspnoea. Injudicious or excessive use will reduce preload and result in diminished cardiac output [8, 9].

Corrective cardiac surgery in early infancy seems to be the most effective therapy to reverse neurohormonal activation in patients with CHD. However, infants with complex cardiac anomalies frequently may not undergo a complete repair in infancy or may need palliative surgery like pulmonary artery banding or aortic-pulmonary shunts which may have a negative impact on their prognosis. [9] Rapid advances have taken place in the diagnosis and treatment of CHD. There are diagnostic tools available, upon trained hands accurate diagnosis can be made even before birth. With current treatment modalities, more than 75% of infants born with critical CHD can survive beyond the first year of live [1].

In developed countries like United States of America, (USA) yearly 32,000 infants are born with CHD; however mortality from heart defects has declined, although CHD remains a major cause of death in infancy and childhood. Age at death is increasing, suggesting that more affected persons are living into adolescence and adulthood [10, 11].

Spectrum of CHD is not race related. A study in Korea showed a similar spectrum of CHD to USA in that population. Despite CHDs like PDA being higher in preterm babies, the incidence of CHD is higher in full term neonates as interestingly documented by the Korean study [8]. The most common symptom that would lead to an echo study was auscultation of a murmur [7].

A retrospective descriptive study in Kanpaur, India, by Koopar and Gupta identified a very high prevalence of CHD, of 26/1000 patient [13]. The reason for this high incidence compared to international rates and previous studies is that this study looked at CHD in 0-15 year's age group and included mild, moderate and severe forms of CHD. Other studies looked at 0-5 years or 5-15 years groups and did not include mild CHD. Similarly this study will include all cases up to 15 years of age. However, it will exclude the mild CHDs (PDAs, VSDs, and ASDs) which spontaneously close by 2 months of age; the age at which a repeat echo would be done for the neonates screened at birth for various reasons and a mild CHD is found, at CWMH.

There is no published data on incidence, prevalence, spectrum or outcome of CHD in the Pacific in the last 15 years. Unpublished data by Mataika R, 2012. [12], a study on the burden of CHD at CWMH, estimated the incidence of CHD in CWMH at 4.9/1000 live births.

All the Pacific island nations rely on overseas cardiothoracic surgeons or FIFO cardiac teams to do consultation and surgery for the children with CHD. Papua New Guinea with a population of more than a million and about 100 children needing surgery each year have taken steps into training cardiac surgeons. Under the leadership of Open Heart International, the local team had performed their first cardiac surgery with the visiting team present in the operating room in 2016 [14].

Unfortunately, the privileges of early diagnosis and early management available to children in developed countries are currently inaccessible to the majority of children in developing countries like Fiji, afflicted with CHD, leading to high morbidity and mortality.

METHODOLOGY

This is a descriptive, retrospective, single-centred study at CWMH. Names of children with CHD were collected from various hospital registries. Folders were retrieved, and if cases fulfilled the inclusion criteria and not the exclusion criteria, they were coded with a unique identification number. Using the unique de-identified numbers (UDN), details from the folders were entered into an excel spreadsheet. Excel data analysis and chi square tests was used to analyze the data.

Inclusion criteria:

- All children <15 years old with newly diagnosed CHD confirmed by echo between January 1st 2012 to the December 31st 2016.
- All children <15 years old who died and CHD was confirmed by post mortem (PM) between 1st January 2012 to 31st of December 2016.

Exclusion criteria:

- No documentation of echo or PM findings noted in the folder.
- Those with spontaneous closure of VSD/ASD or PDA confirmed by a repeat echo at 2 months of age.
- Children referred from other divisional hospitals or Pacific islands.

Process for Data Collection

A search for CHD cases was performed using the Patient Information System (PATIS), ward admission registries, echo registry, FIFO team reports and consultant clinic cardiac patients' records.

There was 89% folder retrieval rate. The Principle investigator (PI) looked through each of the folders and included or excluded each case as appropriate. Each case in the sample group was then assigned a unique unidentified number.

Process for Data Management and Analysis

The coded data collection form (DCF) was used to record information from the folders. De-identified data from the DCFs were entered into an excel spread sheet. Only the PI had access to list of the patients' names corresponding to UDN.

Ethical Considerations

Confidentiality was maintained throughout as discussed above. This study was approved by Fiji National University College Health Research Ethics Committee (CHREC) and Fiji National Health Research and Ethics Committee (FNHREC) of MOH, Fiji.

Pretest

The DCF was pretested with 10 folders of CHD cases and adjustments were made accordingly prior to data collection.

RESULTS

In this five-year study, 348 cases were identified, 311 folders were retrieved, giving this study a folder retrieval rate of 89%. Ninety-nine cases were excluded as they did not fulfil the inclusion criteria or they fulfilled the exclusion criteria. [Figure 1]

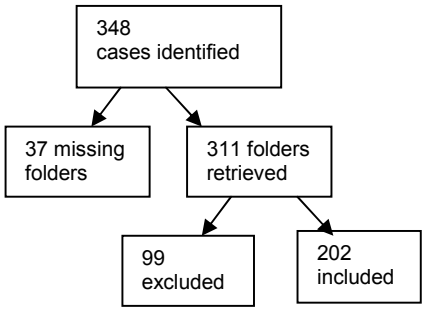

Figure 1: Total cases identified and excluded

The incidence of CHD in CE division in this study is 0.6% (5.8/1000) live births. If the missing folders cases were added to the sample size, the incidence of CHD would have increased to 0.7% (7/1000).

There was no difference in the incidence of CHD between males (51%) and females (49%). However the incidence of CHD in the FoI was double that of the i-Taukei population. (OR of 2 and $p < 0.0001$) The most common acyanotic CHD is VSD and the most common type of cyanotic CHD is TOF. [Figure 2]

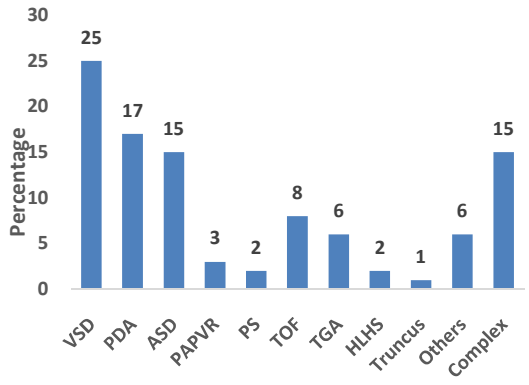

Figure 2 : Types of Congenital Heart Disease by proportion

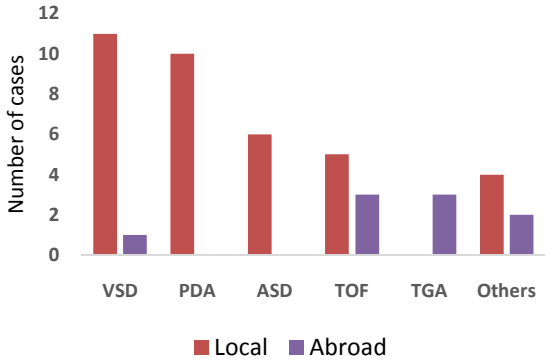

Figure 3: Congenital Heart Diseases cases that underwent surgery

The most common indication for echo referral was a cardiac murmur, followed by cyanosis and tachypnoea. Syndromic neonates also contributed a significant number of cases referred for echo, as part of the syndromic neonates' workup. The majority of cases (82%) were diagnosed before 1 month of age.

There was no statistically significant association in the outcome (death or alive) comparing the age at diagnosis for the critical CHD cases. (Comparing diagnosis <72 hours & >72 hours); P value of 1.

The three most common causes of morbidity (admissions to CWMH) were pneumonia, congestive cardiac failure and failure to thrive. Other reasons were infective endocarditis (IE), cyanotic spells and others.

Forty-six cases (23%) had surgery within the study period. All cases selected for surgery by the three FIFO cardiac teams within the period of study required only one-stage corrective cardiac surgery. Nine cases were considered too high risk and referred for surgery abroad. [Figure 3]

One case out of the 46 cases needed a redo surgery and there was one death. Hence the survival rate for the surgeries done locally was 98% and survival rate for cases done abroad was 100%.

Seventy-six (39%) children in the cohort died. Ninety-five percent of them died before their first birthday. The majority (65%) of these cases were acyanotic CHD cases, and 20% of them had PDA with complications.

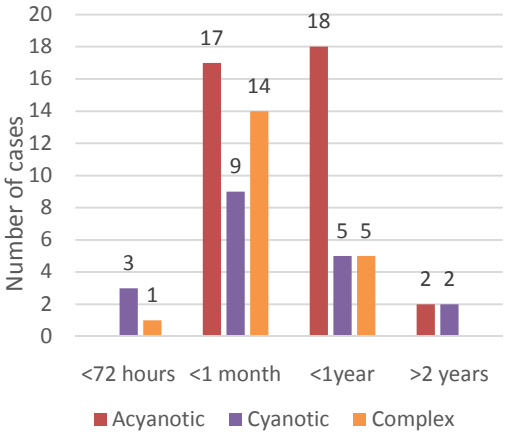

Figure 4: Age at death by Type of Congenital Heart Disease

DISCUSSION

The incidence of CHD in CE division in this study is 0.6% (5.8 per 1,000) live births. This is similar to Mataika's study in 2012 with an incidence of 0.5% (4.9/1000) live births [12]. If the missing folders cases were included, the incidence would have increased to 0.7%. This number would have further increased if positive post-mortems for CHD cases presented as Dead on Arrival (DOA) to other medical facilities within the CE division were included in the sample but this data was not available. It should also be noted that no routine antenatal ultra sound scan screening for CHD was made antenatally, nor was post natal screening with pulse oximetry for critical CHD performed. Cases were referred for echo from within CWMH or the periphery (public health) if clinically indicated. Some CHD cases lesions with subtle findings may not be detected such as ASDs which could account for this lower incidence rate compared to the worldwide incidence of 1% (10/1000) live births [2,5,6,7,8].

There was no difference in the incidence between genders. This is a similar finding to the Korean study [8]. Interestingly, when looking at raw numbers, the i-Taukei population constitute 68% of the cases with CHD compared to the FoI (34%). However, i-Taukei women delivered 78% of the birth cohort, compared to FoI women (17%). Hence the incidence of CHD in the FoI population is twice the incidence in i-Taukei children. (OR of 2, $p < 0.0001$) This could be attributed to the health seeking behaviour of the FoI parents compared to the i-Taukei parents. A similar study in Central Australia comparing the incidence in the Aboriginal and non-Aboriginal population did not find any difference in the incidence between the 2 groups [3].

VSD was the most common acyanotic CHD, followed by ASD and PDA. TOF was the most common cyanotic CHD, followed by Transposition of the Arteries. This is similar findings to the Australian and Indian study [3, 11]. In the Korean study [8], the most common lesion was ASD, and in Mataika's unpublished study [12], TGA was the most common cyanotic CHD. Complex CHD made up 15% of the cases. Complex CHD are cases that can have a mixture of acyanotic and cyanotic CHD and do not fit into any particular type of CHD. These cases were only offered palliative care in Fiji, which does not include palliative surgery.

The 46 cases that had surgery; single repairs were done locally for simple defects such as VSD, ASD and PDA, PS. All three TGA cases (25% of all TGA cases) that had surgery were performed abroad. Seventy-five percent of the TGA cases died, due to late diagnosis, unavailability of prostaglandin or funding for urgent transfer for corrective surgery abroad. Of the 8 TOF cases that had repair ocally or abroad, all had a single-stage repair. Children requiring multiple-stage operations were not operated for a range of reasons, mainly due to lack of funding for multiple surgeries for the TOFs with critical or Severe PS, the need for pacing and management of complications arising from staged operations.

Unlike Mataika's study [12] where the majority of cases had surgery abroad, and most of the mortality was among children with cyanotic CHD, in this study, only 9 (~20%) of the cases had surgery abroad. This is mainly due to the ceasing of major sponsor of funding by Vodafone ATH Foundation (England) 2007-2011.

Twenty-six percent of the deaths were attributable to complex CHD. Palliative surgery cannot be supported locally and the MOH does not fund palliative surgery abroad. However, the majority of deaths were acyanotic CHD (~ 50%) and 65% of these were VSDs, ASDs and PDAs cases who required anti-failure medications. This reflects mortality due to the absence of corrective surgery locally.

The outcome of critical CHD cases, excluding the complex CHD cases (since no palliative surgery was offered) is statistically not significant if diagnosed early (<72hours) or late (>72 hours) This is expected, as unlike other countries where early detection would mean early corrective surgeries, in Fiji, the process of transferring children abroad has

many challenges. These include unavailability of prostaglandins, tele-medicine challenges (image transfer) for confirmation/acceptance, and most importantly the lack of funding or insurance cover.

Despite there being three FIFO cardiac teams visiting Fiji annually, there is still at least a six months gap between visits. During that period, CHD cases diagnosed and requiring urgent surgery were managed medically, until a cardiac team visits. However many of these cases do not survive as they need corrective surgery.

The majority of children who had surgery both locally and abroad are well and are expected to have a normal life expectancy for Fiji. Within 6 months post-surgery, one case required a redo surgery and one child died. That brought the survival rate of local surgeries to 98%, compared to 100% for the surgeries done abroad in New Zealand and India.

LIMITATIONS OF THE STUDY

There was inaccurate recording of the echo studies in the echocardiography registry book. Many critically-ill children had portable echocardiography studies that were not recorded in the register. Other cases of CHD may have been missed because the folders were not correctly or fully classified.

Data was collected from the folders or admissions and hence only admitted cases that presented to CWMH were included in this study. Cases that presented to other medical facilities within the Central/Eastern division and had CHD confirmed by PM were not included in this study.

There are about 80 to 100 cases of intrauterine deaths yearly at CWMH. Post-mortems are not performed routinely in Fiji to determine the cause of death and from published literature this would add 8 to 10 CHD each year.

CONCLUSION

CHD continues to cause high morbidity and contributes significantly to the neonatal and infant mortality rate in Fiji.

While there is a need to continue to improve early detection of CHD to elucidate the burden of disease. Fiji needs to strengthen its management/intervention strategies, especially the unmet need for corrective surgeries, and in the interim, securing funding for urgent referrals, and making longer term plans for the establishment of a Paediatric cardiac-surgical unit in the medium term (five to ten years).

Fiji has been dependent on FIFO teams for more than 20 years and needs to invest in the human resource and infrastructure needed to provide cardiac surgical services. Once Fiji has the infrastructure, resources and local trained human resources, improved methods of early detection like antenatal foetal anomaly scanning and screening for critical CHD postnatally with pulse oximetry, Fiji can then truly address CHD to reduce morbidity and mortality.

RECOMMENDATIONS

The recommendations made from this study are:

1. Establish a national standard for the diagnostic requirements for congenital heart disease including personnel, criteria and equipment.

2. Establish a national database for CHD. This can be piloted at CWMH as there is constant/regular echo clinic done at CWMH.

3. The unmet need for curative corrective surgery for CHD needs to be addressed acutely by strengthening the private-public partnerships through NGO's like Children's Heart Foundation in securing funds for cases that need urgent cardiac referrals abroad.

4. Consider a long term plan, to establish Paediatric Cardiac surgical unit in the next 5 to 10 years. A

local team to be trained in echocardiography, Paediatric cardiology, Paediatric cardiac surgeons and other cadres needed for such a highly specialized unit.

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Original Article

WHAT DO VISITOR'S TO FIJI PERCEIVE ABOUT THE "*BULA SMILE*"? – A SINGLE-CENTRE, CROSS-SECTIONAL STUDY

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ABSTRACT

Background: A "smile" is universal in all cultures as being a friendly greeting. The successes of many tourism industries come through the uniqueness of their country. The phrase "*Bula Smile*" has been widely used by overseas visitors in promoting Fiji.

Methodology: A cross-sectional study was conducted with 32 participants who were international visitors accommodated at the Capricorn Hotel in Suva. Data was collected with a questionnaire, which documented the awareness and the effects of the different types of *Bula Smile* on visitor perceptions.

Results: The most common positive observation of the people of Fiji was their friendliness (47%) followed by the *Bula Smile* (34%). Majority agreed that the *Bula Smile* of the employees was appealing and gave a positive impression, while those with decayed, missing or poorly filled front teeth changed the impression of 38% of the visitors and gave a negative impression of the health status of Fijians.

Conclusion: Results suggest that the *Bula Smile* is being noticed, while also creating a positive impression of Fiji. Moreover, the onus is on those in the tourism industry to exploit the many positives of the *Bula Smile*, using it to recruit new visitors while also influencing a return visit to Fiji.

Keywords: *Bula Smile, Macro-aesthetics, Tourism Marketing, Visitor Perceptions*

INTRODUCTION

A Smile is universal in all cultures as being a friendly greeting and is seen when a person senses happiness, pleasure or when greeting one. In Fiji the "*Bula Smile*" is the term commonly used in the tourism industry defining the welcoming smile on the faces of the locals.

Bula is defined as the Fijian word for welcome; it is really a state of mind, perhaps best expressed in the smiles on the faces of the Fijian people (often called the world's friendliest). Their delight in sharing their tropical paradise with their visitors is known around the world. The *Bula Smile* is perceived as a warm friendly smile which is very welcoming to tourists and is a signature for the island of Fiji.

The *Bula Smile* has an appealing nature to people and it brings friendliness. It is therefore an asset for those who are in the tourism industry whether it is those in the frontline industry or business owners; it is widely used in Tourism Fiji as a marketing tool. Over the last fifty years tourism has grown to be one of the major industries in the world, playing an important role in the economies of many countries, as service industries have taken the place of other traditional industries as being the suppliers of jobs and GDP [1].

In recent years, the tourism industry in Fiji has also risen to being one of the highest earners of foreign exchange. This industry also provides a one of the highest job opportunities for Fijians as there has been a decline in earnings of the sugar industry in Fiji.

It has been understood that the Fijian tourism industry has not had many studies conducted in regard to the *Bula Smile* and this study was to examine the perception of both regional and international visitors to Fiji on how

much the *Bula Smile* had an impact on them in terms of their impressions of Fiji, and their decisions to choose Fiji as a holiday destination.

Mehu, Little and Dunbar (2005) extended research on the "Duchenne Smile" to see if authenticity of employee expression influenced impressions formed and the overall satisfaction of customers [2]. According to the Nation Oral Health Surgery (2004) there is a decline in overall oral health status and this influences the *Bula Smile* negatively [3]. Additionally, the ability of those engaged in customer service to utilize these skills of on-verbal communication via the *Bula Smile* - which in theory has itself been branded as part of the Fiji experience for overseas guests, is at risk.

Dua and Brar (2011) stated that orthodontists, prosthodontists, artists and laypersons had different perceptions of Smile alterations. They also found that when compared, laypersons did not detect minor changes in regards to Smile aesthetics [4]. Srivastava et al (2012) also conducted a study in regards to perception but this was laypersons and malocclusion; they stated that malocclusion are easily recognized by laypersons and is considered a poor trait which usually impulses patients to receive orthodontic treatment [5].

Anecdotal evidence has suggested that the *Bula Smile* brings a positive and friendly feeling into the service provided. It is not just those in the tourism industry but the people of the country are generally friendly. Along with the *Bula Smile*, the friendliness of the people is often quoted by visitors, with some suggesting that maybe the reason for them returning to Fiji over other tourism destinations. This may not always be noticed by all visitors to the country but those who do will be able to indicate what their perceptions about the *Bula Smile* are; while returning visitors will be able to indicate if they have noticed any changes in the *Bula Smile*s.

In one such encounter, Rasoqosoqo (2011) found that among Australian visitors the *Bula Smile* had played a role in their decision to return to Fiji. Such was in-line with the findings that a genuine Smile from frontline customer service staff in the accommodation industry was seen as a positive attribute by both employers and guests, and hence had an impact on guests' experiences and their willingness to return [6].

The paper highlights the significance of the *Bula Smile,* as seen by visitors to Fiji, and indicates what the tourists perceived about the *Bula Smile,* and if the Smiles had an effect on the tourists stay. This study also outlines what the returning visitors perceive about the changes in the different aspects of the various types of *Bula Smile* and if there was any impact of these changes on the tourism industry.

METHODOLOGY

This was a cross-sectional study which was conducted at the Capricorn Hotel in Suva, Fiji and the study was conducted between October and November, 2014. The variable measured in this study was aesthetics and perception of aesthetics (macro-aesthetics).

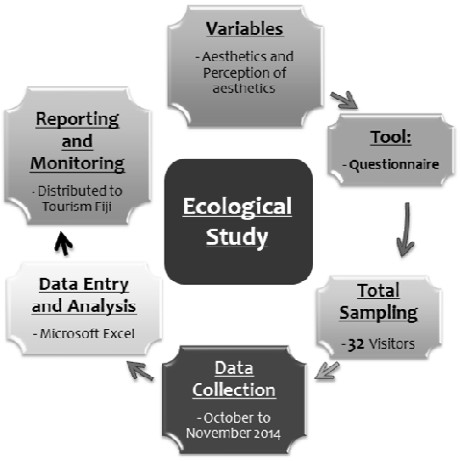
A convenience sampling method was employed at the hotel and data collection completed through questionnaires. Both first time and returning visitors were included in the study sample and the response rate was 80% (n=32). Local visitors were not included in the study while international visitors made up the sample. Local visitors were classified as those who were Fiji residents as well as Fijians who had come from overseas and were staying at the hotel.

A list of hotels was compiled for the Suva area. They were categorized by their star rating. The hotels were requested for the population of frontline employees they employed because some students were also doing research on the employees of the hotels. Hotels which provided the information prior to proposal submission and had a larger number of employees were then ranked and selected.

International visitors were those who were neither Fiji residents or had stayed in Fiji, and were staying at the hotel when the study was conducted. Visitors at the hotel were questioned first during the consent phase if they were a local visitor or an international visitor and only the international visitor were chosen for the study. Only those above the age of eighteen were allowed to take part in the study; individuals below this were not considered. As this was a single blinded study, hotel staff was provided with explicit instructions and they verified the inclusion and exclusion

The variables that were measured in this study were aesthetics and perception of aesthetics (macro-aesthetics). Independent variables were return versus first time visitors to Fiji and the number of years between visits could determine changes in the *Bula Smile*. Dependent Variables were perceptions of the *Bula Smile* and its impact on the decision of tourists to make Fiji a return destination in the future as mediated by the return or first time visit.

The study was approved by the School of Dentistry and Oral Health Research Committee (SDOHRC), College of Medicine, Nursing and Health Sciences Research Committee (CHREC) and ultimately the National Health Research and Ethics Committee of Fiji (FNHREC).



RESULTS

Among the three most common positive observations about the people of Fiji, the second most common observation was the Smile (*Bula Smile*) with some visitors additionally stating that they did not notice anything negative or unpleasant about Fijians.

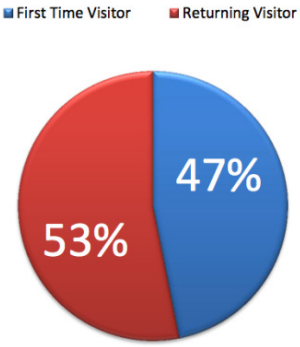


Figure 5: First Time versus Returning Visitors to Fiji (above)

Figure 3: Positive Observations (below)

Of the thirty-two participants, fifteen (47%) were first time visitors while seventeen (53%) were returning visitors with 44% of the visitors stated that their reason to Fiji was for holiday. From the analysis, it was seen that 52% of the visitors were from Australia and New Zealand, and this corresponds with recent numbers recorded by Fiji Bureau of Statistics (2017), stating that the highest number of visitors to Fiji were from Australia and New Zealand, with the numbers being 365,689 and 184,595 respectively from the two countries. With regards to the purposed of visit, 44% of the visitors indicated that they were visiting to Fiji for holiday, 19% were visiting for business purposes and the rest (37%) were visiting for work, training and conferences.

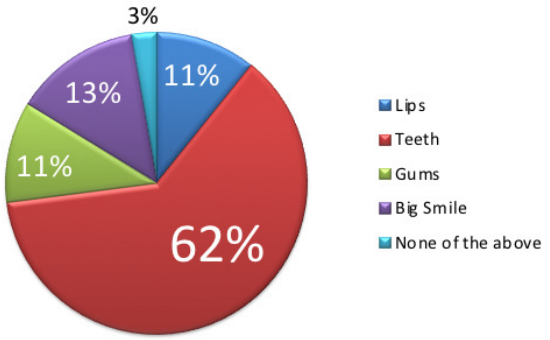


Figure 6: Features noticed by visitors

Of the sample, 62% of the visitors indicated that the feature of the *Bula Smile* which they noticed the most were the teeth; 13% noticed how big the smile was, 11% each noticed the lips and the gums while approximate 3% (1/32) did not notice any of the features listed.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The *Bula Smile* of employees in the service in Fiji was very appealing to me	0	2	6	12	12
The *Bula Smile* had made a positive impression on me on all my visits to Fiji	0	1	1	10	5
The *Bula Smile* adds a unique quality to the Fiji experience and service offered in Fiji	0	1	6	17	8
I was impressed by the welcoming Smile of Fijians, known as the *Bula Smile*, on my first visit to Fiji	0	1	2	13	16
I think the *Bula Smile* I noticed on my first visit has changed over time in terms of it appearance	0	0	5	6	6
The *Bula Smile* has not affected my stay or impressions about Fiji in any way	4	7	8	10	3
A *Bula Smile* with missing or decayed teeth gives me a negative impression about the health status of Fijians	3	11	6	9	3
My understanding of the *Bula Smile* means a perfect set of healthy teeth	1	3	13	10	5
I prefer *Bula Smile*s with no missing front teeth	2	4	9	6	11
I think the condition of front teeth do not matter in the *Bula Smile*, the people are very warm and friendly	11	4	3	10	4
A *Bula Smile* with a few missing teeth did not change my impressions about the Smile of Fijians	12	1	10	7	2
A *Bula Smile* with some decayed teeth did not change my impressions about the Smile of Fijians	11	6	5	8	2
A *Bula Smile* that had fillings with defects did not change my impressions about the Smile of Fijians	12	4	5	9	2

Figure 4: Perceptions of the *Bula Smile* (above)

The bar graph [Fig. 3] demonstrates that among the positive observations listed by the participants, the three most common positive observations were; Friendliness of People (n=15), Smiles (*Bula Smile*s) (n=11) and Hospitality (n=10). Less common positive observations were beautiful people (n=7), others (n=4), tradition (n=2), and no positive impression (n=1).

DISCUSSION

Part of the qualitative data obtained from the study was some of the positive observations that visitors noticed about the people of Fiji. The bar graph [Fig. 3] demonstrates that among the positive observations listed by the participants, the three most common positive observations were: 46% mentioned Friendliness of People; Smiles and the *Bula Smile*s were chosen by 32%, and 31% opted for Hospitality. According to Echtner and Ritchie (2003) destination image is a key marketing tool that can have a powerful influence over tourists' decisions about where to take vacation [7]. Approximately 62% of the visitors indicated that the feature of the *Bula Smile* which they noticed the most were the teeth.

In other studies it was also seen that individuals notice teeth most in a smile followed by lips and gums as well as gummy smiles [8, 9].

From the positive observation, 11 of the 32 visitors actually noticed the *Bula Smile*s of Fijians; however more visitors [15] noticed the behaviour of Fijians being friendly and polite. Furthermore, visitors were questioned about the features of the *Bula Smile* they noticed, and 62% of the visitors indicated that the feature of the *Bula Smile* which they noticed the most were the teeth. This is comparable to a study conducted by Musskopf, Rocha and Rosing (2013) which also found that individuals notice teeth most in a smile followed by lips and gums, with some individuals also stating they noticed gummy smiles [10].

Visitors indicated various positive impressions of the *Bula Smile*, with 75% stating the smiles of the employees in the service industry was appealing, and moreover, 88% of the returning visitors stated that the *Bula Smile* made a positive impression on their visits to Fiji. In addition, 78% of all visitors stated that the *Bula Smile* added a unique quality to the "Fijian Experience" and the service offered in Fiji. This is similarly comparable to an article published in the Fiji Sun (2010) in which a travel writer who was interviewed highlighted the smiling faces of the

people of Fiji. The writer further stated that wherever one goes around Fiji and meet people, whether it is school children, bus drivers, chefs, hotel workers, aircrews, porters or market vendors, they would always smile [11].

The *Bula Smile* adds a unique quality to the Fiji experience and 56% of the visitors agreed to the statement and 50% of the visitors agreed that they were impressed by the *Bula Smile* on their first visit to Fiji. Smile is a feature which enhances the service offered and also adds quality to the service offered [2,6,7,8,12].

A total of forty visitors agreed with the statement that the *Bula Smile* had no effect on their impressions of and stay in Fiji, while thirteen visitors stated that a few missing teeth did not change their impressions of the *Bula Smile,* with eleven visitors disagreeing with the statement that missing or decayed teeth gave them a negative impression about the health status of Fijians.

According to Flores-Mir et al (2004), dental aesthetics perceived through lay persons is independent of education level but may be indicative of the environment they live in [13]. Kokich et al (2006), stated that perceptions of dental aesthetics is dependent on education levels of different individuals as well as different exposures they may have such as television adverts which usually show those with perfect sets of smile [14]. Pinho et al (2007) however have stated that dental specialties such as orthodontics and prosthodontics may have perceptions of beauty different from lay persons due to their education and consideration of minor details when considering aesthetics [15].

This study further looked into the awareness of the *Bula Smile*, with 90% stating that they had seen it and were impressed by it in their first visit; moreover, 71% of the returning visitors stated that they had noticed the deterioration of the *Bula Smile* as compared to their first visit to Fiji. These visitors thought that a *Bula Smile* with missing or decayed teeth gave a negative impression about the health status of Fijians. This observation by the visitors is comparable to the National Oral Health Survey conducted in 2004 which showed increasing numbers of tooth decay and periodontal disease among the adult population of Fijians [3].

As Fiji experiences a decline in overall oral health status (NOHS Report, 2004) [3], the ability of those engaged in customer service to utilize these skills of non-oral communication via the *Bula Smile* – which in theory has itself been branded as part of the Fiji experience for overseas guests, is at risk. As such, while the *Bula Smile* can be seen as a positive attribute for tourism marketing in Fiji, it is at risk due to the increasing poor oral health status.

CONCLUSION

It is evident that the *Bula Smile* is being noticed by visitors and has a greater effect on Fiji's tourism industry than what is currently perceived. Although it may not be the sole reason a visitor returns to Fiji, it can still be used as a marketing tool in both recruiting new visitors and influencing those who have been to Fiji to consider coming back to Fiji.

The results suggest that *Bula Smile* create a positive impression on the people, the country, the service offered to visitors and the overall Fiji experience. The onus is on Tourism Fiji and those in Fiji's tourism industry such as managers and frontline employees to exploit the many positives of the *Bula Smile*. It can also be concluded that display of authenticity is extra-role behaviour for service encounters with an additive effect on encounter satisfaction with customers, but only when other factors are at optimal levels

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Case Report

PENETRATING ULCER DUE TO VIBRIO ALGINOLYTICUS

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ABSTRACT

Vibrio alginlyticus is a halophilic bacillus seldom mentioned in Fiji. My experience suggests that it can be a significant pathogen in our marine environment.

In Australia, septicaemia and death from minor coral scratches have occurred.

CASE

I sustained two minor skin injuries just above my right ankle while in Fiji in November to December, 2017.

The first was an epidermal scratch. To stop inconvenient bleeding, I covered it. Several days later, there was a 12 x 12mm patch of superficial skin necrosis. This healed slowly, without further treatment.

Before the first was healed, I found the second, deeper injury as of a sharp penetrating object, overlying the Achilles tendon. It was clean, about 2mm x 4mm, but tender to touch. There was no indication of a retained foreign body. Once again, I covered it, and left nature to take its course. However, within a few days, superficial skin necrosis had, once again, spread out from the entry point. Like most doctors, I treated myself, using saline cleaning and non-occlusive dressings.

From Day 5 to 8, I had a bout of moderate diarrhoea, which I could not relate to any item of food. On day 8, I resorted to Loperamide, with immediate relief.

By Day 10, increasing tenderness, oedema and mild general malaise were troublesome. By Day 16, it had become acutely tender, especially over the entry wound; so I began to take the only antibiotic I had with me, Ciprofloxacin. When my cache ran out after 4 days, there was enough improvement for me to think it would heal.

Over the next 2 weeks, the oedema and acute focal tenderness returned. The skin lesion was approximately 40mm by 50mm, and becoming deeper. I consulted my GP (general practitioner), who considered that bacteriology of the exudate would not yield anything worthwhile, and prescribed Flucloxacillin. I also took Penicillin V, (because every culture ever taken from me has grown Strep pyogenes, which always responded best to penicillin).

Although the antibiotic regime gave me nausea, I stuck to it for a week. There was slight improvement to the cellulitis, but no local healing. A hard eschar had formed over the skin lesion.

On day 55, (04/02/2017) I took a long walk in the sea at the local, very clean, beach, but this did not help; indeed, the oedema, malaise, and pain became worse over the next days.

So I 'went to the doctor' again. This time, a different doctor took a swab, prescribed Cephalexin 500mg TDS, and arranged an urgent high-resolution ultrasound to search for evidence of any foreign body. The ultrasound scan, supplemented by CT scan showed widespread oedema, and superficial fasciitis of the Achilles tendon, but no evidence of a foreign body.

The report of the swab, taken day 58 (07/02/18), arrived on day 64:

Microbiology:

Epithelial cells +++
Gram positive cocci +++
White cells +++

Culture:
Organism 1: Streptococcus pyogenes Grp A, Heavy growth
Organism 2: Vibrio alginolyticus, Heavy growth

Sensitivity:	Organism 1. (Strep)	Organism 2 (Vibrio)
Amoxycillin	.....	Resistant
Amoxycillin/clavulanate	.....	Sensitive
Ciprofloxacin	.....	Sensitive
Cotrimoxazole	.....	Sensitive
Doxycycline	.....	Sensitive
Cephalexin	Sensitive	.....
Erythromycin	Sensitive	.....
Penicillin	Sensitive	.....

On the evidence of this report, Cotrimoxazole was added to the Cephalexin. Improvement was rapid. Tenderness and oedema were minimal within 2 days, and a swab taken day 71 showed "no growth after 48 hours."

The wound was dry by day 76, and fully healed by day 96. The scar is minimally tethered to the Achilles tendon

COMMENTARY

I submit this personal report to raise awareness of the presence and pathogenicity of uncommonly isolated halophilic microorganisms in our Fiji marine environment.

This case illustrates the role an undetected significant pathogen can play, even in the absence of common underlying causes of poor healing, such as diabetes, vascular insufficiency and retained foreign body.

In Fiji, sea water is commonly regarded as nature's best agent for cleaning and debridement of all types of lesions. In healthcare settings, we routinely use normal saline for wound cleaning.

With halophilic pathogens, this will be counter-productive, especially if this organism invades our all-too-common "diabetic sepsis" lesions.

In my case, port of entry was minor trauma from an unknown source; initial marine contact was minimal, and later contact aggravated the infection. Three courses of antibiotics had minimal effect; in contrast to the rapid response to the specific Cotrimoxazole.

V. alginolyticus is a halophilic, gram negative bacillus, found most often in marine environments. It can cause necrotising fasciitis, otitis, conjunctivitis, and tissue necrosis, especially in immunocompromised persons [1].

This bacillus produces tetradotoxin, a highly potent neurotoxin, which in found in the liver, ovaries, kidneys, skin, and gut of certain fishes, notably the pufferfish, (genus Lagocephalus) and the blue-ringed octopus [2]. This fish is known in Japan as Fugu, and is consumed as a delicacy; but only if prepared by rigorously trained and certified chefs in specially licensed restaurants [3].

The fatal dose in mice is 8 micrograms/kilo; so for a 70kg person this would be about 560 micrograms. While gastric absorption can cause death within minutes, a contaminated wound is unlikely to deliver a fatal dose.

The toxin acts by blocking sodium channels in neurotransmitter channels, and initially causes loss of sensation, progressing to paralysis of voluntary muscle and ultimately, respiratory paralysis and death. Diarrhoea is a reported symptom in non-fatal cases [4].

Case reports I have accessed report normal sensitivities for Gram negative organisms, including Trimethoprim and Sulphamethiazole, (i.e. Bactrim^{T} and Septrin^{T}.) [1,5]. These antibiotics, and the others to which 'my bug' was sensitive, are not commonly prescribed for lower-limb ulcers and/or cellulitis in Fiji.

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Case Report

PURPLE URINE BAG SYNDROME IN TWO PALLIATIVE CARE PATIENTS

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ABSTRACT

Purple urine bag syndrome (PUBS) is a rare manifestation of urinary tract infections resulting in bright purple discolouration of the urine catheter bag and tubing. The phenomenon is common in elderly woman with constipation and urinary tract infections associated with long term indwelling catheter (IDC) use. We present two cases of PUBS witnessed in the emergency department.

INTRODUCTION

Purple Urine Bag Syndrome is a rare but benign condition characterized by the purplish discolouration of the urine collection apparatus in chronically catheterized patients. Chronic constipation and underlying urinary tract infection usually precedes this syndrome. The purple colour is thought to be due to the metabolization of dietary tryptophan.

Here we describe two patients on palliative care who presented with urinary symptoms to the emergency department.

CASE REPORT

Case 1

This is a 70-year-old female with a background history of cervical cancer on palliative care. She is bed bound and has chronic constipation secondary to regular oral morphine intake and reduced mobility. She was on long term Foley catheterization following a presentation of urinary retention secondary to advanced cancer about a year ago.

She presented to the emergency department with a history of abdominal pain, fever, and passing blood stained urine. The patient had been admitted multiple times for urinary tract infections. Her urine bag and tubings were noted to have a purplish discolouration on this presentation. On examination she was noted to be pale and dry. Her vitals were a blood pressure was 80/50, pulse of 74 and temperature afebrile. She had mild abdominal tenderness and other clinical examinations were unremarkable.

The patient's IDC was changed, and she was commenced on intravenous antibiotics (Ampicillin and Gentamicin) in the emergency department. She was referred to the gynaecology team for admission on accounts of severe anaemia (haemoglobin level of 6mg/dL) and urinary tract infection. Patient remained stable in the ward and was discharged after three days following blood transfusion.

The urine culture showed growth of *Providencia rettgeri* which was sensitive to Cefaclor, Trimethoprim and Gentamicin. The IDC tip culture grew *Morganella morganii* with antibiotic sensitivity to Trimethoprim-sulphamethoxazole, Ceftriaxone and Ciprofloxacin. Figure 1 is the picture of the indwelling catheter apparatus after removal.

Figure 1: Urine bag and tubing showing purple discolouration in case 1.

Case 2

A 71 year old woman was bedridden secondary to a stroke. She is diabetic, hypertensive, and has ischemic heart disease. She also has breast cancer and mastectomy was done 17 years ago.

She came in with complaints of a blocked IDC, leakage of urine, painful urination and abdominal pain.

The last IDC change was two weeks prior to arrival. She was previously managed in the emergency department for angina and chronic constipation.

On general examination she was comfortable, fully awake and oriented. Her vitals were stable, and she did not have a fever. There were no significant abdominal exam findings. The catheter tubing and urine bag was found to be purple. IDC was changed and clear urine with sediments was noted. She was discharged home on Trimethoprim-sulphamethoxazole.

Urine cultures yielded *Klebsiella pneumoniae* with growth $>10^8$/ml, sensitivity to Gentamicin, Nitrofurantoin and Cefaclor. The catheter tip culture had growth of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa.* The image below is the catheter apparatus that was changed.

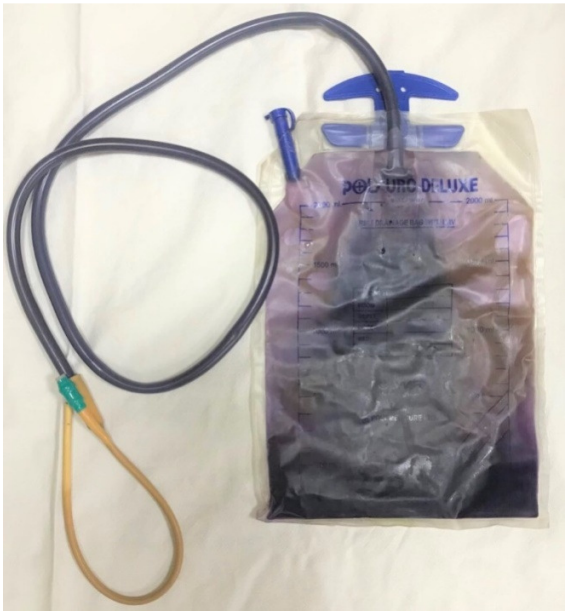

Figure 2: Purple coloured urine bag and tubing in case 2.

DISCUSSION

Purple urine bag syndrome is a unique condition which can appear alarming or even go unrecognized; however it is often a benign condition [1]. The syndrome was initially defined in 1978 by Barlow and Dickson [2] and later, in 1988, Dealler et al described its pathophysiology [3].

The most accepted postulation, yet debatable pathogenesis is that dietary tryptophan is converted to indole by gut bacteria, which is further metabolized in the Liver to indoxylsulphate and then excreted in the urine. Constipation favours conversion of tryptophan to indole by gut bacteria. Once excreted, indoxylsulphate can be processed by bacteria colonizing the urinary catheter to indoxyl, which is further converted to indigo (blue) and indirubin (red). These pigments bring about a deep purple colouration in interaction with the plastic tubing [1, 3].

The most frequently involved bacteria are *Providencia stuartii, Providencia rettgeri, Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis, Morganella morganii, Pseudomonas aeruginosa* and *Enterococcus species.* These bacteria produce indoxyl phosphatase and sulphatase enzymes [1, 4].

It is essential to note that the urine itself does not become purple, instead the plastic bag and catheter colours purple because of the interaction with the metabolites. Evidence also shows that a higher bacterial load within the urine is an important factor in the development of PUBS [12]. The presence of alkaline urine and specifically Polyvinyl Chloride used in the manufacture of the urinary catheter and bag may be important factors in PUBS. Changing to Silicon based catheters show less frequency of PUBS and is thus very rare [4]. Interestingly, PUBS in the presence of acidic urine has also been reported [9].

PUBS have various predisposing factors such as female gender, chronic renal failure, prolonged immobilization, older age, nasogastric feeding, ileal conduit, dialysis, constipation and alkaline urine [7]. In addition, dehydration, advanced chronic kidney disease and azotemia have been reported as risk factors [11].

The purple colour usually appears in patients who have been catheterized for more than a year [6, 12]. The prevalence rate of PUBS is noted to be around 8.3% to 16.7% [4, 5, and 6].

Between 1987 and 2007, a study by Lin et al of ten PUBS cases from nursing homes showed the mean age of the patient was 75.3 years. According to that study; patients were on urinary catheterization for an average of 35.9 months [10]

Purple urine bag syndrome is a sign of urinary tract infection and heavy colonization of the urinary catheter system by different microorganisms. Antibiotics should only be given in patients with symptomatic infection.

There are many different conditions to consider. Figure 3 lists the many causes that lead to change of urine colour [14].

In terms of diagnosing patients, a full physical examination should be carried out. Appropriate history to rule out other causes of urine colour change should be considered.

For asymptomatic patients, treatment of underlying risk factors (e.g., constipation) might suffice [10].

Figure 3: Common causes of Red, Pink and Dark Colored Urine:

- Hematuria
- Hemoglubinuria- urine is red colored, dipstick test is positive for blood but under microscopy there are no blood cells.
- Myoglobinuria-found in rabdomylosis. The urine is very dark or black colored. The dipstick test is positive for blood but there are no blood cells in the microscopic examination.
- Urinary Tract infection- red/pink/ PUBS
- Food dyes-Beets and blackberries (anthocyanin), carrots, Fava beans in large amounts or aloe (Dark Black Urine)
- Drugs- Phenolphthalein, senna, L-dopa, chloroquinine, deferoxamine,Hydroxycobalamin, ibuprofen, warfarin, Rifampicin, Phenazopyrine, propofol, Phenytoin, phenothiazines.
- Poisoning- Chronic lead or mercury poisoning.
- Porphyria- urine appears reddish brown in natural light but florescence pink under ultraviolet light.
- Alkaptonuria- after being exposed to air.

The mainstay of preventing purple urine bag syndrome is the prevention of chronic catheterization, by early removal of urinary catheters once they are no longer needed, or frequent changing of catheters in those patients who require long term catheter placement.

Currently, there is no specific recommended approach for diagnosing PUBS other than visual identification of the purple urine in bag and tubing and to perform simple microbiology (urinalysis, urine culture) and biochemistry tests [15].

Some centres suggest that finding of responsible pigment by spectroscopic analysis of patients' urine confirms the diagnosis but obviously is not a handy method used in every day clinical practice [15].

In terms of treatment, PUBS is considered a benign process, so aggressive antibiotic treatment is a point of debate by specialist. Most of the patients with PUBS remain asymptomatic, its clinical course is usually benign and therefore only changing the urinary catheter and urinary bag usually are enough to solve the problem. Aggressive investigations like urine culture or septic work up and treatment with antibiotics are usually not necessary. Antibiotic is only

indicated when there is concurrent symptomatic urinary tract infection. For asymptomatic patients, treatment should be aimed at the underlying medical problem rather than purple bag itself.

When antibiotics are to be given, Lin et al [10] recommended giving ciprofloxacin. Other case reports showed treatment with a course of cefuroxime in the emergency department that was successful [20]. Some authors have treated PUBS patients with intravenous antibiotic and catheter exchange to non-Teflon type resulting in complete resolution of UTI and purple discolouration of urine [19].

The dramatic sequel that PUBS can indicate is a higher incidence of morbidity and mortality.

Immunocompromised patients in two case studies showed severe complications which were attributed to PUBS [16]. Tasi et al reported the two cases of PUBS in immunocompromised patients which showed progression to Fournier's gangrene [16]. Thus, PUBS can have serious sequela.

CONCLUSION

In conclusion PUBS must be recognized early and appropriate intervention should be commenced in certain cases such as symptomatic PUBS, immunocompromised patients, history of recurrent UTIs, and in institutionalized patients.

There is a need to emphasize proper care of urinary catheters and proper sanitation. We must learn to avoid unnecessary tests and "overkill" treatment plans.

Most importantly, physicians should be taught that PUBS indicates a urinary tract infection due to improper care of urinary catheters.

Most of the authors unanimously agreed and recommended urinary catheter change and a short course of antibiotics, only if there are symptoms of a UTI [21]. PUBS is usually an indolent phenomenon that resolves without sequelae in most cases.

CONFLICT OF INTEREST

No Conflict of interest to declare

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Case Report

MOLAR PREGNANCY WITH CO-EXISTING VIABLE FOETUS DELIVERED PRETERM AT 27 WEEKS GESTATION

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ABSTRACT

This is a case of a pregnant lady who presented in her booking clinic with an abdomen that was considerably larger than her gestational age would suggest. An ultrasound scan revealed a viable foetus, and a large, abnormal placenta, with the appearance of tissue similar to that found in molar pregnancy. The patient developed preterm labour at 27 weeks gestation, and delivered a live baby. Concurrently, the patient passed a lot of grape-like cysts and a large placenta, which through histology, was confirmed to be a partial hydatidiform mole. She needed suction curettage to remove remaining uterine placental tissue.

CASE

The patient was a 25-year old Fijian lady, with her third pregnancy, who hailed from Nabunikadavu, Wainunu, Bua. She had two previous vaginal deliveries with normal outcome (birthweights 3.4kg and 3.6kg), and her past medical history was otherwise unremarkable.

In 2012, she booked at the subdivisional hospital at Nabouwalu, Fiji, at 20 weeks gestation as determined by her last normal menses date. She was serology negative for syphilis, hepatitis B and HIV, and had haemoglobin of 10.4g/dL, and platelet count of 227,000. Her initial examination revealed a large-for-gestation symphysio-fundal measurement of 27cm. Her booking scan was promptly ordered and it showed a viable foetus about 21 weeks size, and normal amniotic fluid index. However, there was a large, heterogenous complex mass noted at the uterine fundus, which was identified to be abnormal placenta with a high suspicion of molar tissue [Figure 1]. At 22 weeks gestation, she presented to Nabouwalu hospital with the complaint of slight per vaginal bleeding and abdominal pain. Subsequent scan showed the foetus to be alive, and she was managed conservatively.

At 27 weeks gestation had another episode of per vaginal bleeding and abdominal pain. Her symphysio-fundal height measurement came to about 43cm. Vaginal examination found that her cervix was dilated to about 3cm, but her membranes were intact and there was no active per vaginal bleeding. With her diagnosis of preterm labour, she was transferred to the divisional hospital in Labasa town for further management.

She was given a course of corticosteroids dexamethasone, and kept in labour ward for close observation, given the likelihood of preterm delivery. Within 12 hours she came into active labour, and she delivered vaginally a preterm male baby, 1.3kg. Along with delivery, there was passage of lots of grape-like cysts. Postpartum, the placenta weighed about 3kg, with an abundant amount of grape-like cystic molar tissue [Figure 2]. Her initial estimated blood loss at labour was approximately 200mL, but her ongoing losses were unaccounted for. Her haemoglobin dropped from a prelabour level of 11.9g/dL, to 6.7g/dL postpartum, and she was transfused three units of packed red blood cells. Her uterus was still enlarged and 'boggy' despite syntocinon being given, and patient was taken to the operation theatre for suction curettage under anaesthesia. This produced large amounts of retained products of conception, mainly abnormal placental tissue and cysts. She was covered with antibiotics – ampicillin, gentamicin and metronidazole. She was discharged 5 days postpartum. Despite the low birth weight, there was no gross abnormality found in baby's examination by paediatricians. Baby did well under NICU care setting and

was eventually discharged. Histology of the placental tissue sent from suction curettage showed partial molar pregnancy. Serum beta human chorionic gonadotrophin hormone (hCG) was taken from the mother immediately postpartum, and in a follow-up clinic two weeks later but due to shortage of laboratory reagents, these were not processed.

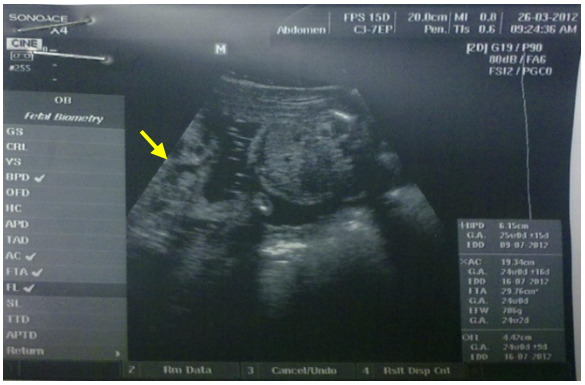

Figure 1. Ultrasonography at booking revealing a viable foetus, and large placenta with abnormal looking tissue (arrow) suggestive of hydatidiform mole.

Figure 2. Large placenta with grape-like cystic tissue

DISCUSSION

A molar pregnancy, or hydatidiform mole, is the manifestation of a conception that is genetically abnormal. With the genetic material all being paternally derived, foetoplacental abnormalities and hyperplasia of placental villous trophoblast develop. Classification of a molar pregnancy depends on histopathological features and genetic abnormalities, and they can be classified into two groups – complete moles and partial moles [1].

Complete moles usually have a 46,XX karyotype. Most complete moles are homozygous and appear to arise from an anuclear, empty ovum that has been fertilized by a haploid (23X) sperm, which then replicates its own chromosomes. In contrast to complete moles, partial moles usually have a triploid karyotype that develops after the fertilization of an apparently normal ovum by two spermatozoa [2].

Molar pregnancies are predominantly non-viable. Hydatidiform mole with a coexisting foetus is an extremely rare phenomenon. The incidence of such an occurrence ranges from 1 in 10,000 to 1 in 100,000 gestations [3]; although there here may be an upward trend due to the high rise in the induction of ovulation. Delivery of a live foetus from these pregnancies occurs in only 15 to 65% of such pregnancies [4,5].

There were two possible conditions with this pregnancy – a partial mole with an abnormal triploid foetus; and a twin pregnancy with one containing the hydatidiform mole (partial or complete), and the other a normal foetus and placenta [6]. Foetuses with partial moles usually have the congenital anomalies associated with triploidy, such as syndactyly and cleft lip. In our case, despite the histology result, there was no abnormality detected on baby's physical examination.

Pregnant ladies with hydatidiform moles usually suffer from excessive uterine size, anaemia, toxaemia, hyperemesis, hyperthyroidism, and respiratory failure. The risk of preterm delivery in a viable foetus with a complete hydatidiform mole is said to be as high as 16 to 50%, and this does not depend on the duration of the pregnancy [4,5]. Our case, given the large uterus owing to its massive placenta, had this outcome. Anaemia from postpartum haemorrhage, followed an inability of uterus to contract adequately due to retained placental tissue, and this warranted a postpartum suction curettage.

In cases with a normal foetal karyotype and no gross foetal abnormalities on ultrasonography, continuation of pregnancy is possible as long as maternal complications are absent or controllable [7]. In some instances, including those with triploid foetuses, termination of the pregnancy may be warranted [8]. In our case, the patient was counselled on several occasions regarding her pregnancy and risks to her and foetus, and she was adamant of continuing her pregnancy.

There were some shortcomings with management of the case which were exacerbated by the geographical isolation of where the woman lived. We were unable to conduct foetal karyotyping antenatally via amniocentesis to see if foetus had any chromosomal abnormalities. Even postpartum, resource constraints prevented karyotyping from being done. In the postpartum period, measurement of serum markers, especially hCG was needed to ensure hCG returned to zero. In this case, hCG was taken from mother immediately after delivery, and two weeks postpartum, but this was in vain, as there was a shortage of laboratory reagents to process the serum in the only medical laboratory on the island. Intensive maternal follow-up in the postpartum period for the risk of persistent or malignant gestational trophoblastic disease is recommended, especially in this case where the there was an aggressive growth in placenta [9].

CONFLICT OF INTEREST

There is no conflict of interest to declare. Permission was sought from the patient for usage of the pictures.

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