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Acknowledgement, if any, of those who contributed to the research or preparation of the paper should follow the text, as well as the acknowledgement of grants and other support.

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Book Reviews

ACR will review selected books in all aspects of clinical science from time to time. Authors interested in having a book reviewed should send a copy to the Editor-in-Chief.

TABLE OF CONTENT

Original article		
1	A 32-year review of rheumatic fever and rheumatic heart disease records at university college hospital Ibadan, Nigeria Omokhodion SI, Odike AI	1
2	Chronic leg ulcers in Irrua Awe OO, Aigbonoga QO.	6
3	Morbidity pattern of paediatric out-patients in rural/suburban areas as seen in Irrua Specialist Teaching Hospital: a pilot study. Ewah-Odiase RO, Ikhayere E, Akpede GO, Obasoyo SE, Alikah SO, Omoike IU	12
4	A randomized controlled study investigating incidence of hypotension during caesarean section under subarachnoid block with prophylactic prevention in a tertiary health facility in Nigeria Okolakpa CO, Benjamin E, Efegebere HA	17
5	Indications for blood transfusion among children in a suburban teaching hospital Ewah-Odiase RO, Dawodu SO, Alikah SO, Akpede GO	23
6	Pattern of contraception usage in the family planning clinic of Kogi State Specialist Hospital, Lokoja, Nigeria Onuminya SD, Egwu O, Folagbade OE.	29
7	Social predictors of burnout and strategies employed in the health care setting. Yusuf AR, Obalowu IA, Muhammed A, Oyeleke OA, Alabi AN, Ademola CO	33
Case Report		
8	Giant Palmar Lipoma: An Unusual Lipomatous Location with Complex Presentation. Aigbonoga OQ, Awe OO, Akerele JM, Ukpebor F, Azeke K, Ngwu SN, Ewoigbe I, Ikhifa C, ⁴ Enegbuya OL, Onoigboria RE.	42

A 32-year review of rheumatic fever and rheumatic heart disease records at university college hospital Ibadan, Nigeria

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Abstract

Introduction: Rheumatic fever (RhF) and rheumatic heart disease (RHD) are recognized causes of morbidity and mortality in Nigerians. They are also the most common causes of acquired heart disease in Nigeria. It was therefore necessary to document the features in patients with these conditions and the number of these patients who had surgical repair from available record sat our Centre in University College Hospital (UCH), Ibadan, southwest Nigeria over 32 years Methods: The study was a retrospective review of 121 patients seen in the University College Hospital Ibadan from 1976 - 2008 (32 years). Data on the symptoms, signs, and interventions in these patients were obtained. Data was analysed using SPSS 16. Results: There were 42 males and 79 females with a mean age of 41.87±16.02 years (range:3-85 years).The major symptoms in these patients were breathlessness (89.3%), tiredness (61.2%) and paroxysmal nocturnal dyspnoea (55.7%). One hundred and fifteen patients (95%) had carditis, 51% had fever and 18.2% had arthralgia. Only 3.3% of the patients had primary prevention. The majority of the patients (44.9%) had secondary prophylaxis in the form of intramuscular benzathine penicillin. One hundred and fifteen patients (95.04%) had rheumatic heart disease with single or multiple valvular involvements. The commonest valvular lesion was mitral regurgitation (86%) and the least common was aortic stenosis (5%). Only 12 (10.4%) of these patients had surgical intervention. Conclusion: Rheumatic fever and rheumatic heart disease are important causes of morbidity in Nigeria. The predominant clinical finding from the study was carditis (95%). Surgery was accessed by only 10.4% of the patients with valvular lesions that were amenable to surgery.

Keywords: Acquired heart disease, Benzathine penicillin prophylaxis, Open heart surgery, Rheumatic carditis.

Introduction

Rheumatic fever (RhF) is an inflammatory disease that occurs due to abnormal immunological response to pharyngitis caused by Lancefield group A β -hemolytic streptococci (GAS)^{1,2} There is a complex interaction between the GAS, a susceptible host and the environment.³ The inflammatory illness caused by this response commonly affects the joints, brain, heart, or skin. It may cause cardiac damage which may be severe and permanent. Rheumatic fever symptoms often occur 2-3 weeks after the pharyngitis³ and it tends to recur.^{1,3} The implicated serotypes of this organism are 1, 3, 5, 6,14,18,19 and 24.¹

Rheumatic fever is a major public health problem in developing countries where it is the most common cause of acquired heart disease.^{1,4,5} The worldwide incidence of first attack of acute rheumatic fever is 5-51/per 100,000 population.^{6,7} In developing countries it has an annual incidence of between 100- 200 per 100,000 school children.^{2,6, 7} Acute Rheumatic Fever is rare in the United States and other developed countries.⁶ It usually occurs between the ages of 5 and 15 years is rare before the age of 3 years^{1,7} and is commoner in females.¹

The revised (1992) T-Duckett Jones criteria are used to make the diagnosis of rheumatic fever.⁸ It is intended for the initial diagnosis of RhF. There are 5 major criteria and 4 minor criteria and an absolute requirement of evidence of a recent GAS infection. Two major or 1 major and 2 minor criteria and

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evidence of recent GAS infection are needed for diagnosis.^{8,9} The exceptions to this rule are the presence of chorea, late-onset or insidious carditis or recurrence of Rheumatic Fever (RhF).^{3,9}

Rheumatic heart disease (RHD) is a long-term complication of rheumatic fever.¹⁰ Nearly 33 million people suffer from RHD worldwide and more than 319,400 individuals died in 2015 while about 471,000 new cases are diagnosed annually.¹¹ The highest prevalence of RHD is in sub-Saharan Africa with more than one million children between the ages of 5-14 years affected.¹¹ The prevalence of RHD in this age group is 5.7 cases per 1000 schoolchildren.^[12]

The mitral valve is the most frequently affected.^{2,12, 13} The aortic valve may also be affected. The heart lesions include mitral incompetence, mitral stenosis, aortic incompetence and aortic stenosis. Tricuspid valve and pulmonary valve involvement are rare.^{2,12} This paper is aimed at documenting the features in patients with RhF and RHD and the accessibility to surgery in cases amenable to surgery from available records at our Centre in southwest Nigeria over a period of 32 years.

Materials and Methods

The study was a retrospective review of 121 patients seen in the University College Hospital Ibadan from 1976- 2008 (32 years). The case notes of all the patients seen in the adult and paediatric cardiology clinics, including hospitalised patients diagnosed with RhF and RHD, were recruited for the study. Several data including the age, sex, occupation, place of residence, symptoms, signs and interventions in these patients were obtained. Data was analysed using Software Package for Social Sciences 23 (SPSS 23).

Results

One hundred and twenty-one (121) cases were studied. Forty-two males and 79 females, with a ratio of 1:1.9 and the age range was 3-85 years, median age was 42 years. Table I shows the age distribution of the cases, with only 13 (10.7%) patients in the paediatric age group and 108(89.3%) patients in the adult range

Table I: Age distribution of cases

Age group (Years)	No of cases
<1	0
1-5	1
6-18	12
19-35	32
>35	76
Total	121

Table II shows the distribution of cases according to the year of presentation, while Tables III and IV show the clinical presentation using the Duckett-Jones criteria.

Table II: Cases according to the year of presentation

Year	Cases
1976-1980	6
1981-1990	63
1991-2000	24
2001-2008	28
Total	121

Table III: Distribution of Symptoms according to Jones Criteria

Major/ Minor criteria	Number of cases (%)
Migratory polyarthritis	4(3.3)
Carditis	117(96.7)
Chorea	0
Erythema marginatum	0
Subcutaneous nodules	0
Fever	62 (51.2)
Arthralgia	22 (18.1)
Prolonged PR interval	4 (3.3)
Raised ESR	38 (31.4)

Evidence of previous Group A β -hemolytic streptococcal (GABHS) infection was determined by ASO titre which was significant in only 6 (5%) of the cases. They had values >333 Todd units.

Eighteen (14.9%) cases presented with Rheumatic fever using the Duckett-Jones criteria. Four (3.3%) cases had oral penicillins for the treatment of sore throat (primary prevention) while 53 (43.8%) cases were on secondary prevention (monthly intramuscular benzathine penicillin).

Table V shows other symptoms in the cases and Table VI shows the valvular lesions in the cases. A total of 115 cases had valvular lesions.

Table IV: Distribution of other symptoms in cases

Symptoms	Number of cases (%)
Breathlessness	108 (89.3)
Tiredness	74 (61.2)
Weakness	59 (48.8)
Orthopnea	76 (62.8)
Paroxysmal nocturnal dyspnea	67 (55.4)

Table V: Distribution of Valvular lesions in the cases

Valvular lesions	Number of cases (%)
Mitral regurgitation(MR)	51 (44.4)
Mitral stenosis (MS)	6 (5.2)
Mitral regurgitation and MS	42 (36.5)
Aortic stenosis (AS)	2 (1.7)
Aortic regurgitation (AR) and AS	1 (0.9)
MS and AR	1 (0.9)
MR and AR	3 (2.6)
MR, MS and AR	6 (5.2)
MR, MS, AR and AS	3 (2.6)
Total	115 (100)

One hundred and nine (90.1%) cases were managed conservatively, and only 12 (9.9%) had surgery and these cases were with mitral regurgitation (1), mitral stenosis (6) and mitral regurgitation and stenosis (5).

Discussion

This study documented the features in patients with RhF and RHD from available records over the study period in UCH. It showed that more females were affected which is similar to reports from previous documentation^{2, 3, 11,14} but the study by Animasahun *et al*, and Akpa *et al* showed that more males were affected than females.^{12,14,15} This difference may be due to the variation in the age group of the subjects in the studies by Akpa and Animasahun and the fact that they studied patients with RHD only. A decrease in the number of cases over the years was not easily demonstrable in this study as reported in developing countries possibly because poverty and

overcrowding, which are major predisposing factors, are still prevalent in Nigeria.¹⁶

Similar to previous studies, rheumatic fever and rheumatic heart disease were rare in cases less than 5 years of age.^{1,7} The highest prevalence was in the age group > 35 years. This is contrary to ages 5-15 years in previous studies of RhF and RHD.^{1,7,11,12} This maybe due to the fact that these patients(>35yrs) presented more with RHD than RhF. Rheumatic heart disease is the most important long-term sequel of RhF¹⁰ and is a major cause of morbidity and mortality.^{5,11,12} These morbidities would have caused the older cases to present in the hospital when alternative forms of management failed and as their last resort. It has also been documented that occasionally, acute RhF occurs in the older age group in epidemics in closed populations like military recruits, crowded living conditions and those in contact with school children.^{17,18}

Only 18 (14.9%) cases had features suggestive of Rheumatic fever at presentation in the hospital. Poor health-seeking behaviour in Nigerians may account for the cases of RHD than RhF. Only 3.3% had migratory arthritis contrary to >75% reported in literature,^{1,2,19} this may be due to the rampant use of non-steroidal anti-inflammatory drugs (NSAIDs) in Nigeria.

One hundred and seventeen patients (96.7%) had carditis. Previous authors had reported an incidence range of 40-75% of carditis in RhF.^{1,2,19} The incidence is higher in this study possibly because patients with RhF, recurrence of RhF and RHD were included in this study. No cases in this study presented with chorea or erythema marginatum.

Evidence of previous Group β -hemolytic streptococcal (GABHS) infection was determined by ASO titre which was significant in only 6 (5%) of the cases. Tani³ documented that about 80% of patients with acute RhF will have an elevated ASO titre which is >333 Todd units in children and >250 Todd units in adults. The six cases in this study had values >333 Todd units. The 5% incidence reported in this study may be because the cases were not all acute RhF cases and possibly because of the late presentation of the cases.

The major valvular lesion was mitral regurgitation (44.4%) as reported by other authors.^{11,12} There were single and multiple valvular lesions and altogether 115 valvular lesions. Forty-two patients (36.5%) had MR and MS, 5.2% had MS, 5.2% had MR, MS and AR, 1.7% had aortic stenosis, and 1% had AR and AS. No patient had AR alone, while 2.6 % had MR, MS, AR and AS. This is similar to the order of rheumatic valvular disease reported in the literature³ but in contrast with the findings in the study in Kano by Abdullahi *et al.*²⁰ No tricuspid and pulmonary lesions were documented in this study. This is similar to the findings by Abdullahi *et al.*²⁰

In the present study, 3.3% of the cases had primary prevention (oral penicillin) during the episodes of sore throat. Primary prevention has been shown in Cuba and Costa Rica to reduce the incidence of RhF and RHD.^{21,22} Also in this study 43.8% had secondary prevention (intramuscular Benzathine penicillin), which is believed not to affect the natural history of RHD.²³

Only 12 cases had access to surgical repair. This may be due to the unavailability of regular surgeries for cardiac lesions in UCH during the study period, the exorbitant cost of surgery in UCH and other centres in Nigeria and or the inability to pay for surgery abroad. The patients who had surgery all had mitral valve lesions. All the others were managed conservatively.

Conclusion

Rheumatic fever and rheumatic heart disease are important causes of morbidity in Nigeria. The predominant clinical finding from the study was carditis (95%). Surgery was accessed by only 10.4% of the patients with valvular lesions that were amenable to surgery.

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Chronic leg ulcers in Irrua

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Abstract

Background: Chronic leg ulcers (CLU) are a common disease globally, that involves the lower leg with the presentation of a non-healing wound above six weeks duration. Chronic leg ulcers have been documented since antiquities. They present with heavy economic and social burden to the individual, family and the nation as a whole reducing productivity and social interactions. Breaking this cycle of chronicity and achieving healing is the target of patient care. Material and Methods: This is a retrospective study of patients who presented to the Plastic Surgery Division of the Department of Surgery, Irrua Specialist Teaching Hospital between January 2021 and December 2022. The data was collected from the Outpatient Clinic, Ward and Operation records during the period under review. The data including the biodata, duration of the ulcer, size of the ulcer, aetiology and treatment modality were retrieved from the records. This information was analyzed using the SPSS version 23. Categorical data were analyzed using the chi-square presented in frequencies and percentages while the nominal data were analyzed using the t-test. the statistical significance is measured at a 95% coefficient or P-level less than 0.05. RESULTS: 60 patients presented to the Plastic Surgery Division of the Department of Surgery during the period under review. 57 of them have complete documentation. The male-to-female ratio is 1:1.1, while the age ranges from 20 to 88 years (mean 54.58 and SD 18.125). Most patients (45.7%) presented in the sixth and seventh decade of life. The commonest aetiology is a venous incompetency (38.6%) followed by diabetes mellitus (22.8%). 49 (86%) of the patients had either a secondary or tertiary level of education. Traders and farmers are the two most common occupations (52.6%) of our patients. Left-sided ulcer is the most common (49.1%), and the modalities of treatment were sterile dressing (18), compression bandaging (26) and skin grafting (13). Compression bandaging was used more in venous, sickle cell and post-traumatic ulcers. There is a significant correlation between the duration and the size of the ulcers with a 2-tailed correlation of 0.006. CONCLUSION: More females presented with chronic leg ulcers which may be a result of cosmetic awareness, hormonal and pregnancy interplay. The level of education increases presentation at the hospital, so the more educated the community, the more the likelihood of presentation for care.

Keywords: chronic leg ulcers, epidemiology, aetiology, treatment modality.

Introduction

Chronic leg ulcer (CLU) is a common disease of the lower limb with its attendant socio-economic consequences. An ulcer is a loss in the continuity of an epithelial lining. CLUs are ulcers that present below the knee: ulcers of both leg and foot. The disease has various etiological factors that vary from one part of the world to the other. It has been established that the commonest

cause of chronic leg ulcers in the temperate region of the world is vascular in origin (peripheral arterial disease, varicose veins, and lymphoedema). While in the tropics, it is post-traumatic, poorly managed diabetic foot ulcers, infections and venous ulcers have been reported as the commonest causes. These causes varied from one area to another in presentation and chronicity¹⁻⁵

The modality of treatment and outcomes also varies due to the availability of the personnel, materials, facilities and resources. Since the patients have to provide resources for their healthcare completely out-of-pocket, the presentation of the patients to the healthcare facilities

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is usually late. The chronicity of these ulcers in our region of the world is due to the interplay of poor healthcare systems, ignorance and poverty. Despite these factors, there is a need to know the present epidemiology, and aetiology and possibly know the outcome of the common treatment modalities, due to the socio-economic dynamics of our society. Technological advancement has turned the whole world into a global village so that what used to be unavailable, inaccessible and unaffordable in rural and suburban areas is now possible with a snap of the fingers. Encouraging patients to present early may reduce the disease burden, hence reducing the cost of treatment, less in the out of work days and an eventual increase in productivity.

Materials and Methods

This is a retrospective study of all clients that presented with CLU to the Plastic Surgery Division of the Department of Surgery, Irrua Specialist Teaching Hospital (ISTH), Irrua, Edo State over 2 years (from January 2021 to December 2022). ISTH is a tertiary healthcare and teaching hospital for Ambrose Alli University, College of Medicine. It is a 450-bed capacity hospital. It serves approximately about 5 million people covering the Edo Central, Edo North Senatorial Area and the adjoining areas of the Ondo, Ekiti and Kogi State.

All the patients that presented to the Plastic Surgery outpatient clinics, admitted into the surgical wards through the emergency room were included in the study except those whose documentation was not adequate for the study. The sociodemographic data (including age, sex, occupation, level of education etc.), clinical characteristics (like duration, aetiology, the side affected (or both legs), the size of the ulcer), the treatment modality (non-operative and operative modalities), and the outcome (post-operative complications, and mortality) was obtained from the case notes of the clients from the health records department, the operation records in the theatre and the ward documentation.

Exclusion criteria include patients who presented with acute wounds and have stayed beyond 6 weeks on admission or follow-up clinics and patients who presented with ulcers of the leg that healed in less than 6 weeks. The data were obtained using a designed questionnaire. These collected data were analyzed using the Statistical Package for Social Sciences version 26 (SPSS 26) from International Business Machines Inc.

Illinois USA (IBM Inc). Data were expressed in the form of proportions and frequency tables for categorical variables. Means and standard deviation were used to summarize continuous variables. The test statistics used include the student's test and the Chi-squared test. The student's t-test was used to test for differences between quantitative variables and the Chi-squared test was used to test associations and comparisons of proportions. Significance was taken as a p-value less than 0.05.

Results

60 patients presented to the Plastic Surgery Division of the Department of Surgery with CLU during the period of study. Three of these patients had no complete documentation necessary for the study and were exempted from the data analyses. There were more females than males, with a male-to-female ratio of 1:1.1 (as shown in Fig. 1). The age ranges from 20 to 88 years (mean 54.58 and SD 18.125). The youngest patient was a sickle-cell disease patient with bilateral chronic leg ulcers, while the oldest presented with a recurrent venous left leg ulcer. Most patients (45.7%) presented in the sixth and seventh decade of life as represented in Table 1. The commonest aetiology is venous incompetency/insufficiency (38.6%) followed by diabetes mellitus (22.8%); this is followed closely by trauma. This is shown in the cross tabulation of the age and aetiology in Table 2.

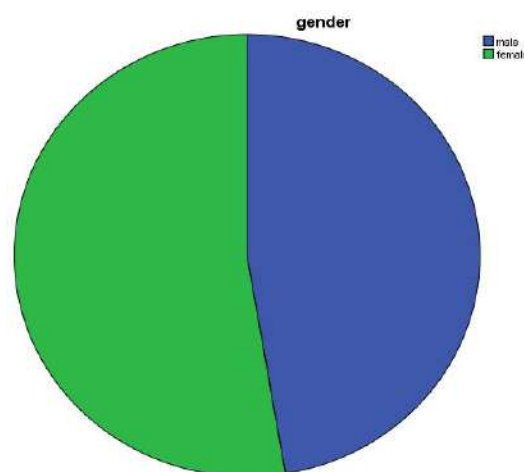


Fig.1: Gender distribution of the patients

The diabetic leg and foot ulcers did not present until the 5th decade of life and also peripheral arterial disease ulcers presented after the 7th decade. Peripheral arterial disease is mainly a disease of the elderly. Post-traumatic ulcers were the third most common.

Table 1: Age of the patients

	Age			
	Frequency	Per cent	Valid Percent	Cumulative Percent
Valid				
20-29 years	8	14.0	14.0	14.0
30-39 years	5	8.8	8.8	22.8
40-49 years	8	14.0	14.0	36.8
50-59 years	11	19.3	19.3	56.1
60-69 years	15	26.3	26.3	82.5
70-79 years	5	8.8	8.8	91.2
80-89 years	5	8.8	8.8	100.0
Total	57	100.0	100.0	

Table 2: Cross tabulation of age and aetiology

Age * Aetiology Cross tabulation									
Count	age	Aetiology						Total	
		Venous	Peripheral arterial disease	Post-traumatic	Sickle cell	Diabetes	Post-infective		Others
	20-29 years	3	0	1	4	0	0	0	8
	30-39 years	2	0	1	2	0	0	0	5
	40-49 years	3	0	4	0	1	0	0	8
	50-59 years	4	0	2	0	4	0	1	11
	60-69 years	5	0	2	0	7	1	0	15
	70-79 years	3	1	0	0	0	1	0	5
	80-89 years	2	1	1	0	1	0	0	5
Total		22	2	11	6	13	2	1	57

Table 3: Size of the ulcer

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
less than 100cm ²	20	35.1	35.1	35.1
100cm ² - 200cm ²	22	38.6	38.6	73.7
greater than 200cm ²	15	26.3	26.3	100.0
Total	57	100.0	100.0	

73.7% of the ulcers were mainly less than 200m² as in Table 3. There were 68 ulcers in the 57 patients with 11 patients presenting with bilateral ulcers. There were more ulcers on the left than on the right (39:28) and the left-sided ulcers were more than the left across all the aetiology as shown in Tables 4 and 5.

Table 4: Side affected by the ulcer

	Frequency	Per cent	Valid Percent	Cumulative Percent
Valid				
Right	18	31.6	31.6	31.6
Left	28	49.1	49.1	80.7
Both sides	11	19.3	19.3	100.0
Total	57	100.0	100.0	

Table 5: Cross tabulation of the side affected and the aetiology.

Side affected * Aetiology Cross tabulation									
Count	Side affected	Aetiology						Total	
		Venous	Peripheral arterial disease	Post-traumatic	Sickle cell	Diabetes	Post-infective		Others
	Right	8	0	4	2	4	0	0	18
	Left	10	1	5	2	8	2	0	28
	Both sides	4	1	2	2	1	0	1	11
Total		22	2	11	6	13	2	1	57

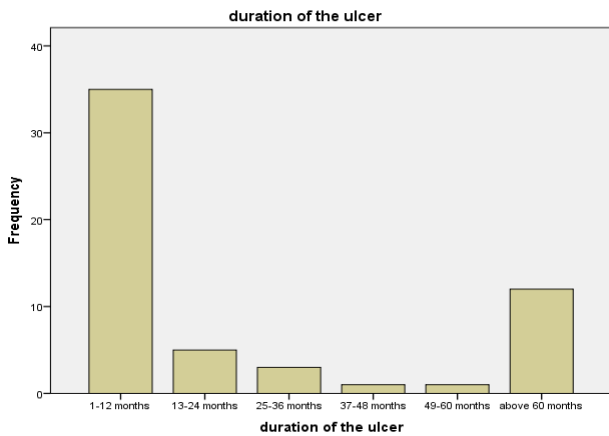


Fig. 2: Showing the distribution of the duration of the ulcers

Table 6: Correlation between age, duration and size of the ulcer

		Correlations			
		Age	Duration of the ulcer	Size of the ulcer	
Spearman's rho	Age	Correlation Coefficient	1.000	-.173	-.098
	duration of the ulcer	Sig. (2-tailed)	.	.199	.468
		Correlation Coefficient	-.173	1.000	.357**
	size of the ulcer	Sig. (2-tailed)	.199	.	.006
		Correlation Coefficient	-.098	.357**	1.000
		Sig. (2-tailed)	.468	.006	.

** . Correlation is significant at the 0.01 level (2-tailed).

b. List wise N = 57

There is no significant correlation between the age of the patient and the duration of the ulcer, nor there is any significant correlation between the age of the patient and the size of the ulcer but there is a moderate association between the duration of the ulcer and the size of the ulcer. Most of the patients who presented in the hospital have at least a secondary level of education (49 patients).

Those who had only regular sterile dressing were 18, those with sterile dressing combined with compression bandaging were 26 and those who had regular sterile dressing, with or without compression and skin grafting before healing of the ulcers were 13. Regular sterile dressings with or without compression bandaging were adequate in most of the patients (44). One of the patients

who had compression bandaging was lost to follow-up before the wound was completely healed.

Table 7: Modality of treatment

		Modality of treatment			
		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Compression bandaging	right	18	31.6	31.6
	Sterile dressing	left	28	49.1	49.1
	Skin graft	both sides	11	19.3	19.3
Total		Total	57	100.0	100.0

Discussion

Chronic leg ulcers (CLU) are common debilitating diseases, that lead to both social and economic predicaments. CLU is usually associated with significant morbidities, high cost of healthcare, loss of productivity and reduced quality of life.¹⁻³ It is common in developed countries with leading aetiology being of vascular origin especially venous rather than arterial. It leads to an annual economic burden of up to \$12 billion as a result of human capital loss and the cost of healthcare for these patients in the US. Every year 2-3 million more Americans are diagnosed with various types of chronic wounds. The estimated annual incidence of leg ulcers in the UK and Switzerland are 3.5 and 0.2 per 1000 individuals respectively.^{4,6} There is an incidence of 120:10000 of the population, increasing as most of the population becomes older or elderly.^{5,7}

However, the population of the developing and underdeveloped countries are mainly made up of youths, so the aetiology is expected to be different, in their presentation.

In this study, there was a slight preponderance of females over males with a male-to-female ratio of 1:1.1, which is not significantly different from the equal distribution in both males and that was reported in Ilorin⁷. Many researchers have stated that there are higher incidences in females especially in the study from Europe and the United States of America. Most of these patients (45.6%) that presented with CLU were in the sixth and seventh decade in this study and increasing progressively with age. However, it was reported that there were two peak incidences in the study in Ilorin,⁷ where the first peak was in the fourth decade and the sixth decade⁸⁻¹⁰. This shows that the incidence increases as the population ages as reported earlier.

The etiologies were mainly venous and diabetes mellitus, followed closely by trauma. Post-traumatic ulcers were the commonest aetiology in the study of Ilorin. This may be because our patients are those who presented in the consultant outpatient clinic with chronic leg ulcers or presented to the emergency room due to complications or different pathology. Patients presenting with post-traumatic chronic ulcers due to poor or wrong treatment were fewer in this study, many presented as acute ulcers and appropriate treatment was instituted. Though their wounds may not have completely healed before the end of the sixth week but were in the process of healing due to the severity of the injury.

The CLU in patients with sickle cell anemia account for 10.5% in this study which is high compared to the study in Ilorin and Zaria.^{2,7} Many of these patients had bilateral ulcers, which are painful and filled with pale, sloughy or unhealthy granulation tissues^{11,12} Peripheral arterial disease caused ulcers presented after the sixth decade in this study, which indicated that this disease is usually the disease of the elderly and becomes commoner as the elderly population increases, due to better healthcare and increased literacy levels^{2,7,10}

Chronic leg ulcers due to malignancy were not seen during the period of the study. This may be because most ulcerated malignant lesions or malignant ulcers run a very aggressive course and therefore patients usually present early. The common type of chronic malignant ulcer is Marjolin's Ulcer, which is a malignant transformation of chronic benign wounds, unstable scar or discharging sinus.^{3,6}

The majority of our patients have a minimum of a secondary level of education. Many of these still patronized traditional medicine healers before presentation in the hospital. This may be due to a strong belief in tradition in this part of the world. However, their level of compliance with treatment modalities and follow-up was encouraging following the presentation 73.7% of the patients presented with ulcers size of less than 200cm², and the majority presented during the first 12 months of the ulcer. There is no significant correlation between the size of the ulcer and the age of the patient. However, there is a significant correlation between the size of the ulcer and the duration of the ulcer.

CLU are commoner on the left leg than on the right in this study which is similar to the previous studies.^{2, 7,8}

However, the reason for this is not known but may not be far from the fact that most people are right-footed, which indicates that the left foot is less active and more predisposed to venous congestion and hypertension.

Almost one-third of the patients had their ulcers healed using only sterile dressing, elevation and rest. This means that adequate knowledge about this simple, inexpensive method will resolve their problem. Even many of the other ones that needed compression bandaging or skin grafting to be combined with sterile dressing would not have progressed to those stages. In this study, flap cover or direct closure were not parts of the modalities of treatment. In extensive ulcers, we were able to achieve good granulation tissue followed by skin grafting. Vacuum-assisted therapy was used in patients with extensive and deep ulcers to encourage good granulation tissue filling the defect and wound contraction. This was followed by skin grafting in all cases.

Compression bandaging was added to the sterile dressings in the majority of the patients with venous ulcers and ulcers in patients with sickle cell anaemia, which encouraged compliance with treatment without the need for prolonged admission.¹²⁻¹³ This also improves their functionality during the period of treatment. It also significantly reduces the cost of treatment and disturbance of daily sterile dressing. Depending on the rate of discharge from the ulcer, the frequency of the dressing can be reduced to once, twice or thrice a week. Compression therapy when appropriately applied increases the rate of healing. Fig 3a - d



Fig. 3a: Venous ulcer



Fig. 3b: compression bandage application



Fig. 3c: Healing after 4 weeks



Fig. 3d: Healed ulcer after 8 weeks

Conclusion

CLU is a common debilitating disease with significant adverse effects on the physical, emotional and financial well-being of the patients. The knowledge that a simple, inexpensive readily available and accessible combination of sterile dressing, elevation and rest can result in the healing of a third of these ulcers from this study. This can be used to reduce the burden of this disease, in developing countries where the majority of the populace has limitations in accessing specialist healthcare facilities.

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Morbidity pattern of paediatric out-patients in rural/suburban areas as seen in Irrua Specialist Teaching Hospital: a pilot study.

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Abstract

Background: In the absence of community-based information, hospital data can be a valuable tool for assessing the epidemiology of diseases within populations. There is paucity of information on the morbidity pattern of children in rural and suburban areas of Nigeria. Objective: To determine the morbidity pattern among Paediatric Outpatients in a malaria endemic area. Materials and Methods: A retrospective analysis of the records of the Paediatric Outpatient seen at Irrua Specialist Teaching Hospital, Irrua. Results: A total of 3,812 patients were assessed in 9,122 visits over 12 months period giving an average of 2.4 visits per child per year. Acute respiratory tract infection 1,414 (37%) and malaria 891(23.3 %) were the two commonest diagnoses. Conclusion: Infectious diseases constitute the most common illness among Paediatric Outpatients in rural and suburban areas.

Keywords: Morbidity, Pattern, Paediatric Outpatients, Rural/Suburban Area

Introduction

The advent of the Sustainable Development Goals (SDGs) further underscores the need for assessment of the epidemiology of diseases within populations. This is required to enable the placement of cost effective measures to improve the quality of life of persons in the population and to meet the SDGs.¹ Knowledge of the morbidity pattern could guide policymakers, healthcare planners and managers in making informed decisions on the allocation of resources to the different aspects of healthcare.²

In the absence of community-based data, general outpatient data in healthcare facilities provides perhaps the next best estimates of the burden and pattern of diseases in the population² The results from such appraisals whether retrospective or prospective, can also be used to improve services.³

Although reports on the morbidity pattern of childhood illnesses are available, these are mostly from emergency paediatric units in large urban settings and very few have emphasized the pattern seen in Paediatric Outpatients (POPs).^{1,3-7} Most of the studies also concentrated on specific age groups.^{2,4,7} Also the few studies available are from large urban hospitals.^{1,7} Aside from these issues, the morbidity pattern in populations varies with location and time.^{1,7}

ISTH is a unique tertiary institution being one of the few, if not the only one located in rural areas. It thus serves as a first point for initial patient visits and follow-up management as well as a referral centre. The location and services of the hospital thus provide a unique opportunity for investigation of the pattern of illnesses in children in rural areas in sub-Saharan Africa. This retrospective pilot study aims to describe the morbidity pattern of children seen in the Paediatric Outpatients Department (POPD) of ISTH as a prelude to a comprehensive prospective review of the morbidity pattern in POPD and the community.

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Methodology and Methods

Irrua Specialist Teaching Hospital was commissioned 31 years ago and serves Edo State and the neighboring states of Delta, Kogi and Ondo. Patients are mainly self-referred, fee-paying and dependents of staff and others on the National Health Insurance Scheme. The patients therefore represent the various strata of the socio-economic classes, religions and ethnic groups in the region. The POPD register and case notes of all the children who visited the clinic from 1st September, 2011 to 31st August, 2012 were retrospectively reviewed and the relevant information extracted. The children who visited the Paediatric Consultant Outpatient Patient Department (COPD) clinic were excluded from the study. This is because they take care already diagnosed special cases who may require regular check-ups or monitoring. They may not necessarily be ill.

Data analysis was done using SPSS version 10. Information obtained from the case notes and registers included date of visit, age, sex and main diagnosis. The principal diagnosis was determined through history, physical examination and preliminary investigation by the Paediatric Registrar under the supervision of a senior registrar or consultant. The Paediatric Outpatient clinic attendance registers were examined to obtain data on total number of children seen at the hospital for one year. The seasons were defined as the wet season (May to October) and the dry season (November to April) as seen in a typical rainforest area in which Irrua is located. Statistical analysis included calculation of percentages, ratios and test of significance as required with the level of significance of differences set at $p < 0.05$. Permission to conduct this study was sought and obtained from the ISTH Research and Ethics Committee.

Results

During the one year period, a total of 9,122 visits were made to the POP by 3,812 children aged one day to 18 years, thus an average of 175 visits was made per week and 2.4 visits per patient per annum. There were 1,914 (50.2%) males and 1,898 (49.8%) females giving a male to female ratio of 1.01:1. One thousand and fifty-nine (27.8%) were < 1 year old, 2,112 (55.4%) were aged 1-5 years, while 446

(11.7%) and 195 (5.1%) were aged 6-10 years and 11-18 years respectively. Figure 1 is a graphic representation of the age group distribution of the study population.

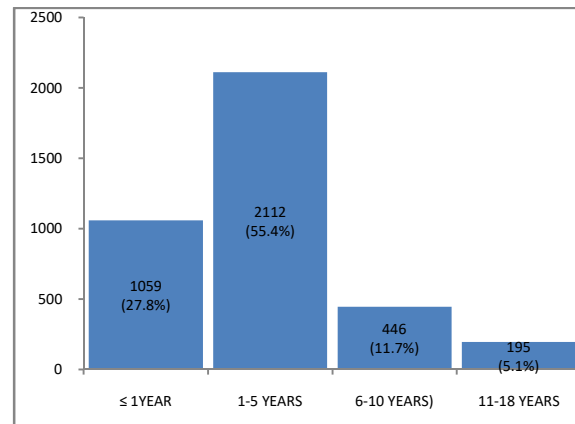


Fig 1: Bar chart showing ages of children seen in the POPD

Of the 9,122 visits made, 4,652 (51%) were during the wet season, while the remaining 4,470 (49%) were during the dry season. The monthly visits expressed as a percentage of the total visits are shown in Figure 2. The highest frequency of visits was in March, followed by October and July respectively; and the lowest frequency of visits was made in May followed by January.

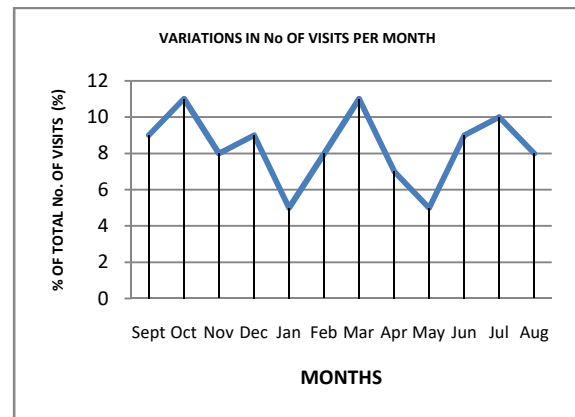


Figure 2: The monthly visits expressed as a percentage of the total visit per month

Table 1 shows the distribution and percentages of POPD visits made diagnoses grouped into infectious and non-infectious diseases. Across all age groups, infectious diseases accounted for most of the visits and this was statistically significant ($\chi^2 = 222.71$, $p = 0.00001$). Figure 3 is a graphic representation of the same information.

Table 1: The distribution and percentages of diseases organized into disease origin of outpatient POPD

Age in groups	Infectious origin (%)	Non-infectious origin (%)	Others (%)	Total (%)
<1year	956 (90.3%)	93 (8.8%)	10 (0.9%)	1059 (100)
1-5 years	1697 (80.3%)	209 (9.9%)	206 (9.8%)	2112 (100)
6-10 years	378 (84.8%)	59 (13.2%)	9 (2.0%)	446 (100)
11-18 years	125 (64.1%)	65 (33.3%)	5 (2.6%)	195 (100)

($\chi^2=222.71, p = 0.00001$).

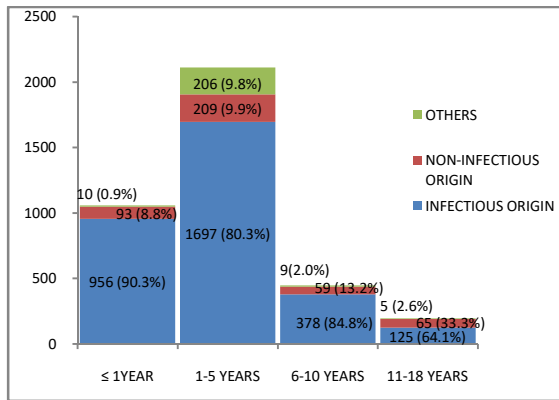


Fig 3: Bar chart showing diseases organized into disease origin of outpatient POPD.

The distribution and percentages of the diagnoses made during POPD visits, classified according to the International Classification of Diseases 10 by age group as shown in Table 2. This revealed that diseases of the respiratory system, infectious, parasitic diseases and conditions originating from the perinatal periods accounted for most of the POPD visits.

Classification of diseases based ICD 10⁸

Infectious and parasitic diseases: malaria, conjunctivitis, diarrhoea, HIV infection, chicken pox, viral exanthema, PTB and mump

Diseases of musculoskeletal: septic arthritis and chronic osteomyelitis.

Conditions originating in the perinatal periods: Neonatal sepsis. Neonatal jaundice, congenital disorders and prematurity

Diseases of respiratory system: ARTI, asthma and bronchiolitis

Diseases of genitourinary system: UTI, nephrotic syndrome

Nervous system: Cerebral palsy, seizures and migraine

Digestive system: Peptic ulcer disease and abdominal pain

Diseases of blood: Hemangioma, SCD

Neoplasm: Hemangioma

Endocrine, nutrition: Diabetes mellitus

Mental and behavioural diseases: Schizophrenia

Table 2: Diagnoses using the International Classification of Disease 10 (ICD 10)⁸

ICD classification of diseases	≤ 1year (%)	1-6years (%)	6-10years (%)	11-18years (%)	Total (%)
Diseases of the respiratory system	554(35.4)	814 (52.0)	151 (9.6)	46 (3.0)	1565 (100)
Infectious and parasitic diseases	378 (24.9)	849 (56.0)	214 (14.1)	76 (5)	1517 (100)
Conditions originating in the perinatal period	88 (87.1)	13 (12.9)	0 (0)	0 (0)	101 (100)
Diseases of the genitourinary system	0 (0)	59 (66.2)	15 (16.9)	15 (16.9)	89 (100)
Surgical cases	10 (13)	53 (68.8)	4 (5.2)	10 (13)	77 (100)
Diseases of the blood or blood-forming organs	2 (2.9)	52 (75.4)	7 (10.1)	8 (11.6)	69 (100)
Diseases of the skin	13(25.0)	23(44.2)	11(21.2)	5(9.6)	52(100)
Diseases of the digestive system	0 (0)	7 (18)	11 (28.2)	21 (53.8)	39 (100)
Diseases of the nervous system	1 (3.0)	22 (64.7)	8 (23.5)	3(8.8)	34 (100)
Neoplasms	1 (3.1)	14 (43.8)	14 (43.8)	3(9.3)	32 (100)
Diseases of the musculoskeletal	2 (66.7)	0 (0)	1 (33.3)	0 (0)	3 (100)
Endocrine, nutrition	0 (0)	0 (0)	0 (0)	2 (100)	2 (100)
Mental and behavioural diseases	0 (0)	0 (0)	0 (0)	1(100)	1 (100)
Others	10 (4.3)	206 (89.2)	10 (4.3)	5 (2.2)	231 (100)

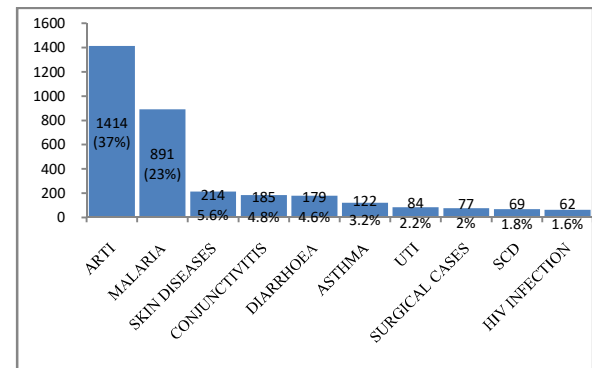


Fig 4: Commonest diseases seen at the outpatient clinic

Figure 4 is a graphic representation of the distribution and percentages of POPD visits by diagnoses. The most common diagnosis was acute respiratory tract infection (37%) followed by malaria (23%) and skin diseases (5.6%) respectively. Table 3 is a frequency and percentage distribution table of the diagnoses made in POPD during the period of study.

Table 3: Frequency distribution table of the diagnoses made in POPD during the period of study.

Diagnosis/Age group	<1	1 - 5	6-10	11-18	Total
Acute respiratory infections	543	698	145	28	1,414
Malaria	203	503	141	44	891
Skin diseases	59	71	22	10	162
Allergic skin diseases	13	23	11	5	52
Conjunctivitis	44	94	31	16	185
Diarrhoea	66	106	4	3	179
Asthma	0	98	6	18	122
Urinary tract infections	0	59	14	11	84
Surgical illnesses	10	53	4	10	77
Sickle cell anaemia	2	52	7	8	69
HIV infection	6	53	3	0	62
Malignancies	0	13	14	3	30
Bronchiolitis	11	18	0	0	29
Congenital conditions	15	13	0	0	28
Neonatal jaundice	27	0	0	0	27
Prematurity	24	0	0	0	24
Seizure disorder	0	15	6	3	24
Neonatal sepsis	22	0	0	0	22
Peptic ulcer disease	0	0	7	14	21
Viral exanthema	0	18	0	0	18
Dental illnesses	0	7	4	6	17
Chicken pox	0	0	10	1	11
Cerebral palsy	1	7	0	0	8
Nephrotic syndrome	0	0	1	4	5
Pulmonary tuberculosis	0	0	3	2	5
Mumps	0	4	0	0	4
Heamangioma	1	1	0	0	2
Diabetes mellitus type I	0	0	0	2	2
Migraine	0	0	2	0	2
Septic arthritis	2	0	0	0	2
Recurrent abdominal pain	0	0	0	1	1
Chronic osteomyelitis	0	0	1	0	1
Schizophrenia	0	0	0	1	1
Sexual assault	0	0	1	0	1
Others	10	206	9	5	230
TOTAL	1,059	2,112	446	195	3,812

Discussion

About four of every five children attending the POP is an under-five in this study. This is consistent with previous reports which affirm high susceptibility of this age group to morbidity (and mortality) in childhood.¹⁻³ The male to female ratio of approximately 1:1 computed in this study was similarly reported from a POPD study in Abuja.¹ This does not agree with the usual supposition of cultural parental preference for male children typically reflected in studies in eastern Nigeria where higher ratios were reported.^{3,7} The reason for the change is unclear and further studies are required to confirm this. Still, it is a possible development that could amount to the attainment of the SDGs of which gender equality is a component.⁹ The frequency of hospital visits was slightly higher during the wet season as in Abuja report¹. However, this study showed a drop in the frequencies of clinic visits in January and May, perhaps occasioned by trade union disputes and industrial actions. This may have affected the pattern of seasonal variations.

The commonest morbidities were ARI, malaria and dermatological diseases. Infectious diseases remain common causes of childhood morbidity.^{1,5,10,11} Acute respiratory infections were the foremost diagnosis in this study. This is different from the findings in the Children Emergency Room, Benin City which is closest to Irrua that reported malaria as the commonest cause of morbidity.⁵ Apart from the difference in time and location, most patients who have malaria will likely be treated in the Children Emergency Room; while most acute respiratory infections may more likely be treated in the POPD. Also, there is no documented report on the morbidity from the CHER, Irrua. This finding may be partly attributable to the high proportion of under five children who are the at increased risk age group of ARI.¹² This finding also underscores the need for pneumococcal vaccines in children.

Malaria was the second highest commonest diagnosis. A high prevalence of malaria is ordinarily expected as Nigeria is holoendemic for malaria. The reduced prevalence may be due to measures put in place for the control of malaria in the sub region.¹³ The prevalence of dermatological diseases is lower than that reported from Abakaliki probably because

the latter study population was on adolescents.¹⁴ A higher prevalence was also reported in Abuja.¹ Hormonal changes in puberty and self-awareness can be plausible reason skin diseases amongst this age group. Being the third rank prevalence is an indication of the need for public enlightenment on skin diseases.

Although diarrhoeal diseases are a major cause of childhood morbidity, cases usually present to the CHER and are subsequently managed in the Diarrhoea Treatment and Training Unit (DTTU). There is no report of Lassa fever in this study even though the hospital is situated in a Lassa fever endemic area. This is because they are usually acutely ill patients and so they present to CHER and are subsequently transferred to the Lassa ward for expert care.

Conclusion

The pattern of morbidity in children remains similar with preventable infections leading the list of morbidities. Children under five years old are still the most vulnerable group. There is a need to improve strategies to reduce the prevalence of infectious diseases in children.

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A randomized controlled study investigating incidence of hypotension during caesarean section under subarachnoid block with prophylactic prevention in a tertiary health facility in Nigeria

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Abstract

Background: Maternal hypotension is a common complication of spinal anaesthesia for caesarean delivery. The objective of this study was to assess a randomized controlled study investigating incidence of hypotension during caesarean section under subarachnoid block with prophylactic prevention in a tertiary health facility in Nigeria. **Methods:** This was a prospective, randomized double blind clinical study. Patients were randomized into three groups: Ondansetron (O) Ephedrine (E) or Normal Saline (NS). Group O received ondansetron 10 mg in 10ml saline; Group E received ephedrine 10mg in 10ml saline, while group NS received normal saline 10ml. All study drugs were given intravenously 5 minutes before spinal puncture. Data was analyzed using SPSS 25. The significance level was set as $p < 0.05$. **Result :** There was no significant difference in the 3 groups in terms of age ($p = 0.077$), weight ($p = 0.677$), height ($p = 0.949$), BMI ($p = 0.307$), ASA ($p = 0.092$) and educational status ($p = 0.841$). The difference in the incidence of hypotension between the 3 groups was highly significant ($p = 0.000$), but was comparable between ephedrine and ondansetron groups ($p > 0.05$). The severity of hypotension was more in the control group compared to the ephedrine and ondansetron groups, and the difference was highly significant (20%, 2.2% and 4.4% respectively, $p = 0.000$). **Discussion and Conclusion:** The study showed that ephedrine and ondansetron are comparable when used as prophylaxis for prevention of spinal anaesthesia induced hypotension during caesarean delivery.

Keywords: Randomized controlled study, hypotension, subarachnoid block, caesarean section, ondansetron and ephedrine

Introduction

Spinal anaesthesia is a popular technique for caesarean delivery as it is easy to perform and it provides a rapid-onset, dense sensory block. Although, not commonly associated with maternal or foetal risk from toxicity to local anaesthetics¹, common side effects include hypotension and bradycardia, which may be deleterious to both parturient and baby¹. Maternal hypotension is the most common intraoperative complication following

spinal anaesthesia during caesarean delivery, with an incidence as high as 50 – 80%.²⁻⁴ Various prophylactic methods are currently used to prevent or minimize hypotension, including left uterine displacement, crystalloids or colloid preloading, utilization of compression stocking on the lower extremities and vasopressors, however, none of these methods is fully effective.⁵⁻⁹

Current studies indicate that 5-HT₃ antagonism may abolish the Bezold-Jarisch reflex (BJR) response to spinal anaesthesia. The bezold-Jarisch reflex occurs in response to noxious stimuli, the afferent unmyelinated c-fibers travel through the vagus to

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enhance the baroreceptor reflex mechanisms, inhibit sympathetic output, and inhibit vasomotor tone, leading to peripheral vasodilation. Ondansetron is a selective 5-hydroxytryptamine 3 (5-HT₃) receptor antagonist, and thus may be beneficial for preventing bradycardia and hypotension, the mechanism of action is believed to be inhibition of Bezold-Jarisch Reflex (BJR). This reflex is mediated through vagal afferents, which, when activated cause hypotension and bradycardia.¹⁰⁻¹⁴

The objective of this study was to compare the efficacy of ondansetron and ephedrine in preventing spinal anaesthesia induced hypotension during caesarean delivery. The justification for this study is that findings from this study will provide insightful information to address gaps regarding this or related topic in Anaesthesia.

Materials and Methods

Study Area: The study was conducted in Delta State University Teaching Hospital, Oghara, Delta State, Nigeria. This is a tertiary healthcare facility in Delta State that provides specialized care for a large proportion of patients in Delta State and other neighbouring states.

Study Design: The study was a prospective, randomized, placebo-controlled, double blind trial that evaluated whether the use of ondansetron will reduce the incidence and severity of hypotension in comparison with ephedrine and the placebo group. Each eligible patient was randomly allocated to either the ondansetron group (O), the ephedrine group (E) or the placebo group (NS) using computer generated random number table (Stat trek's Random Number Generator: Stat Trek.com). These computer-generated codes were placed in sealed envelopes and the envelopes were placed in a box. Each patient picked only one envelope from the box. The number picked by the patient in the sealed envelope randomized the patient into the appropriate group.

Selection Criteria:

Inclusion criteria:

- i. Patients aged 18 to 35 years
- ii. Elective caesarean section
- iii. ASA classification I or II

- iv. Term, Singleton Pregnancy

Exclusion Criteria:

- i. Patient's refusal
- ii. Presence of Diabetes mellitus
- iii. Hypertensive disorders
- iv. BMI > 40
- v. Complicated pregnancy such as placenta praevia, preeclampsia
- vi. Allergy to the study drugs
- vii. Contraindications to spinal anaesthesia
- viii. Patients receiving selective serotonin re-uptake inhibitors or migraine medications

Sample size calculation:

- In a previous study by Ayorinde et al¹⁵, the incidence of hypotension in patients who received placebo was 70%.
- It is predicated that prophylactic intravenous ondansetron will reduce the incidence of hypotension to 40%
- Alpha (type 1 error) = 0.05
- Beta (type 2 error) = 20%
- Power (1-beta) = 80%
- Confidence interval = 95%

The following formula was used for the sample size calculation:¹⁶

$$N = r + 1/r (P_1) (1 - P_1) (Z_{\beta} + Z_{\alpha/2})^2 / (P_1 - P_2)^2$$

Where:

N = required sample size

R = ratio of cases to control (r + 1/r = 1 + 1/1 = 2)

Z_{α/2} = desired statistical difference (1.96)

Z_β = desired power (0.84 for power of 80%)

P₁ = estimated prevalence = 70%

P₂ = desired prevalence = 40%

P₁ - P₂ = effect size = 70% - 40% = 30% = 0.3

Therefore:

$$n = 2 \times 0.7 \times (1 - 0.7) \times (0.84 + 1.96)^2 / (0.3)^2$$

$$1.4 \times 0.3 \times 7.84 / 0.09 = 3.30 / 0.09 \approx 37$$

Attrition rate was estimated at 20% = 8. The sample size for each arm was 37 + 8 = 45. A total sample size of 135 patients was needed to detect a statistically significant difference among the three groups with 90% power; assuming ondansetron would decrease the incidence of hypotension by 30% following spinal anaesthesia compared to placebo.

Study Protocol

All eligible patients were seen in the ward a day before surgery and the study protocol was explained to them to the best of their understanding. Those who accepted to participate in the study and gave consent were enrolled. Pre-anaesthetic evaluation (history, physical examination and airway assessment using Mallampati scoring system) was carried out, and patients were classified using the ASA physical health status. Patients were fasted for solid food for eight hours (due to delay gastric emptying in parturient) and for clear fluids for 2 hours. On the day of surgery patients were transported to the theatre in supine position with left lateral tilt. In the theatre, anaesthetic machine, suction machine and other ancillary equipment were checked for functionality.

A second anaesthetist who was not involved in the study randomized the patients, using the computer-generated random numbers into group O, E and NS. Group O received ondansetron 10 mg, group E received 10 mg ephedrine and group NS received 10 ml of normal saline intravenously. The study drugs were prepared by the pharmacist and presented to the investigator in 10ml solution in 10ml syringes thus blinding the patient to study the drugs. The syringes were presented in coded labels O, E and NS to correspond with patients' group allocation. The study drugs were administered by the second anaesthetist in the absence of the investigator. The principal investigator who monitored the outcome measures was thus blinded to the study drugs.

Resuscitation drugs (atropine, adrenaline and ephedrine) were made available, on arrival in the operating room, a Mindray multi-parameter monitor was attached to the patients, and baseline vital signs (pulse rate, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure, and oxygen saturation values) were obtained. An 18-gauge intravenous cannula was inserted into a vein on the dorsum of either hand, or the forearm. After cannulation, Normal saline or Ringer's lactate was commenced for preloading at 15 ml/kg in 30 min and fluid maintenance at 10 ml/kg for the first hour and 5 ml/kg subsequently.

Parturient were premedicated with i.v ranitidine 50 mg and metoclopramide 10 mg in the operating room 30 min prior to induction of spinal anaesthesia. After

preloading, the study drugs were administered by second anaesthetist as per the protocol. Five minutes after the administration of the study drugs, spinal anaesthesia was performed under aseptic technique, with patients in the sitting position, at L3L4 interspace. A 25G Whitacre needle was used following confirmation of free flow of cerebrospinal fluid, patients received 2 ml (10 mg) of hyperbaric bupivacaine and 0.5 ml (25 mcg) fentanyl, a dressing was applied over the puncture site. Sensory block was assessed using a gentle pinprick with 25G hypodermic needle to ascertain the maximum level of sensory block. Bromage scale¹⁷ [Bromage score IV: grade I- free movement of legs and feet (0%), II- just able to flex knees with free movement of feet (33%), III- unable to flex knees, but with movement of feet (66%), IV- unable to move legs or feet (100%)]¹⁵ was used to evaluate motor block. Surgery commenced when the desired maximum sensory block height of T4 was achieved. The haemodynamic parameters (PR, SBP, DBP, MAP and SPO₂) were obtained and recorded every 2 min until stable and thereafter every 5 minutes until skin closure. Hypotension, defined as a decrease from baseline values of 20% in systolic arterial pressure or SAP < 80 mmHg,¹⁸ was treated with rapid administration of normal saline infusion and ephedrine bolus 3 mg aliquots until restoration of normal values.

Ethical Approval: Approval was sought from the Hospital ethics and Research Committees for the conduct of the study. Confidentiality and anonymity was ensured for all respondents.

Statistical analysis

Data entry and analysis were done using the statistical package for social sciences (SPSS) IBM statistics version 25. Quantitative data were expressed as means \pm standard deviation (SD), or median and interquartile range. Descriptive and Inferential Statistics were deployed in this study.

Results

A total of 135 patients participated and completed the study. Table I shows patients' demographic characteristics. There was no significant difference in the 3 groups in terms of age ($p = 0.077$), weight ($p = 0.677$), height ($p = 0.949$), BMI ($p = 0.307$), ASA ($p = 0.092$) and educational status ($p = 0.841$).

Table I: Socio-demographic characteristics of patients. Data presented in mean ± SD; count (percent)

Parameter	Control	Ephedrine	Ondansetron	P-Value
Age (years)	30.97 ± 1.61	29.77 ± 1.61	30.33 ± 2.67	0.077
Weight (kg)	78.83 ± 16.05	81.10 ± 6.20	79.20 ± 6.46	0.677
Height (m)	1.69 ± 0.07	1.69 ± 0.06	1.69 ± 0.07	0.949
BMI (kg/m²)	28.22 ± 1.24	28.43 ± 1.67	27.82 ± 1.66	0.307
ASA				
I	28 (62.2)	34 (75.6)	37(82.2)	0.092
II	17 (37.8)	11 (24.4)	8 (33.3)	
Educational Status				
1^o	11 (24.4)	7 (15.6)	8 (17.8)	0.841
2^o	23 (51.1)	25 (55.6)	26 (57.8)	
3^o	11 (24.4)	13 (28.9)	11 (24.4)	

P-value < 0.05 is significant

Table I above showed 3 groups were comparable with regard to the pulse rate (p = 0.268), systolic blood pressure (p = 0.207), diastolic blood pressure (p = 0.151), mean arterial pressure (p = 0.113), respiratory rate (p = 0.472), and SpO₂ (p = 0.345).

Table II: Baseline vital signs. Data presented in mean ± SD.

Parameter	Control	Ephedrine	Ondansetron	P-value
	Mean ± SD	Mean ± SD	Mean ± SD	
Pulse Rate (beats/min)	82.36 ± 6.22	82.62 ± 6.12	80.69 ± 5.95	0.268
Systolic BP (mmHg)	126.71 ± 4.47	126.36 ± 4.34	127.98 ± 4.77	0.207
Diastolic BP (mmHg)	76.98 ± 3.11	75.76 ± 3.82	76.30 ± 3.39	0.550
MAP (mmHg)	87.22 ± 7.59	85.16 ± 2.37	86.23 ± 5.10	0.156
RR (cycles/min)	17.60 ± 1.05	17.27 ± 1.29	17.24 ± 1.09	0.188
SpO₂ (%)	99.44 ± 0.50	99.22 ± 0.97	99.38 ± 0.51	0.262

P-value < 0.05 is significant

Table II showed about 64.4% of patients developed hypotension in the control group compared to 24.4%

and 35.6% in the ephedrine and ondansetron groups respectively.

Table III: Severity of hypotension among the 3 groups: Data presented in counts (percent)

Parameter	Control	Ephedrine	Ondansetron	Total	P-Value
	Count (%)	Count (%)	Count (%)		
Severity of hypotension					
Mild	6 (13.3)	4 (11.1)	8 (13.3)	18 (13.3)	0.463
Moderate	9 (20.0)	4 (6.7)	4 (8.9)	17 (12.6)	0.008
Severe	14 (31.1)	3 (6.7)	4 (8.9)	21 (15.6)	0.002

P-value < 0.05 is significant

Table III showed severity of hypotension was more in the control group compared to the ephedrine and ondansetron groups, and the difference was significant (20%, 2.2% and 4.4% respectively, p = 0.002).

Table IV: Intraoperative block characteristics and Apgar score. Data presented in count (percent).

Parameter	Control	Ephedrine	Ondansetron	Total	P-value
Bromage Scale					
III	5 (11.1)	8 (17.8)	6 (13.3)	19 (14.1)	0.651
IV	40 (88.9)	37 (82.2)	39 (86.7)	116 (85.9)	0.763
Sensory Block Height					
T3	1 (2.2)	2 (4.4)	1 (2.2)	4 (3.0)	0.822
T4	33 (73.3)	36 (80.0)	35 (77.8)	104 (77.0)	0.411
T5	11 (24.4)	7 (15.6)	9 (20.0)	27 (20.0)	0.198

P-value < 0.05 is significant

Table IV showed a higher proportion of patients attained Bromage grade IV compared to grade III in all groups (85.9% vs. 14.1%).

Discussion

The findings of the index study showed that ondansetron was superior to placebo but comparable to ephedrine in preventing or reducing the severity of hypotension in patients undergoing Caesarean section under spinal anaesthesia. The average incidence of hypotension in the index study was 41.5%. This is much lower than the population incidence of 70-80%¹⁸⁻²⁴, however, the study by Edomwonyi and colleagues¹¹ was retrospective in nature. The difference in the definition of hypotension may have resulted in the difference in outcome measures noticed.^{25,26} According to the findings in the index study, not only does ondansetron reduce the incidence of hypotension, it reduces the severity as well, and ultimately the requirement for ephedrine supplementation. This agrees with the reports from the studies done by Trabelesiet al²⁷, and Rashad et al²⁸, where they found that prophylactic ondansetron administration significantly decreased both the hypotension and the doses of vasopressors in parturients undergoing elective caesarean section under subarachnoid block compared to placebo. While Ortiz-Gómez and Terkawi used 8mg of ondansetron in their study; 10mg was used in the index study. The lower doses used by these authors^{29,30} compared to the index study may have resulted in the different outcome observed.

The incidence of hypotension in the ondansetron group in the index study was 35.6%. This is similar to the incidence of 35.7% reported by Hudson et al²⁰, and 37.5% by Trabelsi et al²⁷. In contrast, some authors reported a higher incidence compared to that of the index study. Specifically, Ortiz-Gómez and colleagues²⁹, Shah and co-workers³¹, and Nivatpuminet al¹⁰ reported a higher incidence of 44.6%, 46.0% and 53.6% respectively. The incidence of hypotension in the ephedrine group in the index study is 24.4%. This is in agreement with 25% and 32% reported by Vercauteren et al²¹, and Ngan-Kee et al³²⁻³⁴. Colloid preload has been shown to be superior to crystalloid preload.^{35,36}

Limitations

Though ondansetron may be considered expensive compared to ephedrine, research on the cost implication and the length of PACU stay following administration of ondansetron is yet to be explored.

Conclusion

Ondansetron was able to significantly reduce the incidence of hypotension in the study as it was comparable to ephedrine but superior to placebo in reducing the incidence and severity of hypotension; It is therefore pertinent that ondansetron should be administered prior to spinal anaesthesia for the prevention of maternal hypotension.

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Indications for blood transfusion among children in a suburban teaching hospital

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Abstract

Blood transfusion (BT) has remained a valuable treatment modality in children. Though lifesaving it has associated risks. Thus, its use has to be judicious. There is a lack of information on the indications for BT, which may impact the prevalence of these in children in sub-Saharan Africa. Evidence-based information on the indications for BT in children will be useful in ensuring the safety of BT amongst children and possibly its prevention. Objective: To determine the indications for blood transfusion among paediatric patients in Irrua Specialist Teaching Hospital (ISTH). Material and Methods: This was a 12-month retrospective study conducted in the Department of Paediatrics of ISTH (from 1st May 2008 to 30th April 2009). The case files of children, who had blood transfusion orders, were retrieved from the medical records department and relevant data was extracted. The data was analysed for age groups, wards and indications for blood transfusion. Results: The prevalence of blood transfusion is 14.3% with a blood transfusion rate of 5.1 per week. Blood transfusion was highest in the Children Emergency Room, commonest age group (60.4%) was > 28 days to 5 years with severe malaria as the commonest (46.4%) indication. Neonatal jaundice was the most common indication (48.5%) for transfusion amongst neonates and in SCBU. Conclusion: Malaria control programmes including malaria vaccine and surveillance for neonatal jaundice need to be strengthened to reduce blood transfusion rates.

Keywords: Blood transfusion, Indications, Children, Suburban, Teaching hospital

Introduction

Severe or life-threatening anaemia is a major health problem among children in developing countries.¹ Blood transfusion (BT) has remained a valuable healthcare intervention amongst anaemic children.² Although BT is a lifesaving measure, it is associated with well-documented risks.³ Hence, there is a need to have clear-cut indications for blood transfusion before the procedure is commenced. The rate of transfusion varies with the geographical region and level of health care provided.⁴ Transfusion data may be used in connection with demographic data in geographical areas and thus be used for the calculation of specific values of risk of transfusion or unit incidence rate.⁴ Diagnoses may be used to determine and forecast BT.⁵⁻⁷

There is a dearth of data on the indications for BT in children in sub-Saharan Africa.^{8,9} Preventive efforts to reduce childhood morbidity and mortality from anaemia require sufficient data on the aetiologies and demographic distribution in the region. Periodic appraisal of blood transfusion practices may improve its impact on causes of anaemia in children. Evidence-based information on the indications for BT in children will be useful in the strategy for policy design and implementation to reduce the need for BT.⁹ It will also be used for formulation of BT policy in children.

Materials and Methods

The study was a descriptive, retrospective study conducted at the Paediatrics Department of the ISTH which is situated in a suburban region in Southern Nigeria and renders health care services to Edo, Delta, Kogi and Ondo States. It has a functional blood bank that supplies all departments in the

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hospital. Blood supply is sourced locally as there is no supply from the National Blood Service Commission; although the bank is connected to the commission. Services provided by the blood bank include blood grouping and cross-matching, screening for HIV, hepatitis B and hepatitis C; and supply of whole blood and other blood products like packed cells.

A review of the records of all children from birth to sixteen years of age who received blood transfusions over one year from 1st May 2008 to 30th April 2009 was conducted. Information extracted included the age, sex, diagnoses necessitating the blood transfusion as well as the wards in which they were managed. The wards were the Children Emergency Room (CHER), which is one of the main entry points into the Paediatrics Department of the hospital and where acutely ill children are admitted, resuscitated and stabilized before transfer into the Paediatric ward where care is given till discharge. CHER also serves as a point of entry for ill newborns, into the Special Care Baby Unit, who are coming from home or other health facilities. Children involved in accidents requiring care from the trauma unit are usually stabilized in the Accident and Emergency (A & E) unit. The analysis was done using SPSS version 10.

Results

Of the 2,869 blood transfusion orders made during the period under review in the hospital, 652 (22.7%) transfusion orders were requested from the Paediatrics Department for a total of 459 patients.

A total of 1,856 paediatric admissions occurred during the period under review. Of the 459 patients who had blood transfusion orders, 269 (58.6%) records were completely retrieved and 265 patients received blood transfusion giving a prevalence of BT of 14.3%. A blood transfusion order rate of 12.5 per week and a blood transfusion rate of 5.1 per week were computed; as not all transfusions ordered were carried out. There were 163 males and 102 females giving a male-to-female ratio of 1.6: 1. In all, 226 (85.3%) of the transfused patients were under five years of age. This is shown in table 1.

Table 1: Age Distribution

Age range	Frequency	Percentage (%)
0 – 28 days	66	24.9
29 days – 5 years	160	60.4
> 5 years	39	14.7
Total	265	100.0

Table 2: Sex Vs Ward Distribution

Wards	Male Transfused	Female transfused	Total Transfused (%)	Total Admissions (%)
Scbu	43	23	66 (24.9)	522 (12.6)
Cher	108	68	176 (66.4)	1152 (15.3)
P-ward	9	10	19 (7.2)	178 (10.7)
A & E*	3	1	4 (1.5)	
Total	163 (61.5%)	102 (38.5%)	265 (100.0%)	

*Accident and Emergency
($\chi^2 = 2.28$; df = 3, p = 0.51)

Table 3: Sex Vs Transfusion Distribution

Sex/ Transfusion	Yes (%)	No (%)	Total (%)
Male	163 (61.51)	902 (56.69)	1065 (57.38)
Female	102 (38.49)	689 (43.31)	791 (42.62)
Total	265 (14.28)	1591 (85.72)	1856 (100.0)

($\chi^2 = 2.89$; df = 1, p = 0.089)

Table 4: Indications for Transfusion

Indications	Frequency	Percentage(%)
Severe Malaria	123	46.4
Septicaemia	37	14.0
Neonatal Hyperbilirubinaemia	32	12.1
Disseminated Intravascular Coagulopathy	10	3.8
Anaemia of Prematurity	9	3.4
Haemorrhagic Disease of the Newborn	9	3.4
Lassa fever	8	3.0
Malignancies	8	3.0
Surgical	5	1.9
Trauma	4	1.5
Others	20	7.5
Total	265	100.0

Table 5: Indications for blood transfusion among the neonates / SCBU

Indications	Frequency	Percentage (%)
Severe Neonatal Hyperbilirubinaemia	32	48.5
Disseminated Intravascular Coagulopathy	10	15.2
Anaemia of Prematurity	9	13.6
Severe anaemia secondary to *HDN	9	13.6
Neonatal Sepsis	6	9.1
Total	66	100.0

Transfusion Rate = 1.3/WEEK

*Haemorrhagic Disease of the Newborn

Table 2 shows 66.4% and 24.9% of the transfusions took place in the Children's Emergency Room (CHER) and Special Care Baby Unit (SCBU) respectively. Table 3 is a sex vs blood transfusion distribution table. Table 4 shows the indications for blood transfusion in all the patients. The distributions of indications among the wards and age groups are shown in tables 5, 6, 7 and 8. At least, one baby received a form of blood transfusion every week in SCBU.

Table 6: Indications for blood transfusion among those aged > 28 days to 5 years

Indications	Frequency	Percentage (%)
Severe Malaria	117	73.1
Septicaemia	23	14.3
Lassa fever	5	3.1
Trauma	2	1.3
Probable Autoimmune haemolytic anaemia	2	1.3
Bacillary dysentery	2	1.3
Malignancy	1	0.6
Others	8	5.0
Total	160	100.0

Table 7: Indications for blood transfusion among those aged > 5 – 16 years

Indications	Frequency	Percentage (%)
Septicaemia	9	23.1
Malaria*	6	15.3
Trauma	5	12.8
Malignancy	4	10.3
Surgical	4	10.3
Lassa fever	3	7.7
Typhoid fever	2	5.1
Others	6	15.4
Total	39	100.0

* 2 with Sickle Cell Anaemia

Table 8: Indications for blood transfusion in CHER

Indications	Frequency	Percentage (%)
Malaria	121	68.8
Septicaemia	23	13.1
Lassa fever	6	3.4
Malignancies	4	2.3
Surgical	3	1.7
Trauma	2	1.1
Others	17	9.6
Total	176	100.0

Transfusion Rate = 3.4 / week

Discussion

Blood transfusion (BT) is an important procedure in paediatric practice which is used in a variety of medical conditions to replace lost components of the blood. It is therefore not surprising to find the high prevalence of BT demonstrated in this study. The overall prevalence of BT computed was 14.3% and all units of the paediatrics department were involved in the study. A higher prevalence was reported in Enugu (41.2%) where paediatric non-emergency blood transfusion was reviewed.⁹ The exclusion of the population of patients in the Children Emergency Room may be the reason for the higher figure. Lower figures have been computed in many studies in which only children in the emergency paediatric unit were recruited.^{4,5} However, similar rates were reported from Owerri and Benin City where only patients in Children Emergency Room were

recruited.^{10,11} These rates may reflect differences in transfusion thresholds in the various hospitals. No local study was found to consider all the units in paediatrics as a whole as was done in this study. The computed BT rates were 5.1, 1.3 and 3.4 per week overall for SCBU and CHER respectively. A higher rate (8.6 per week) was computed for CHER alone in Benin City.¹¹ In the current study, 85.3% of the children transfused were under the age of five years. This is the age range of high vulnerability to morbidities such as malaria which can be complicated by anaemia. Other studies have demonstrated the same pattern.^{10,11} No form of protein-energy malnutrition was found as an indication for transfusion in this study. This is against a rate of 5.9% reported in a north-central Nigerian study which was undertaken about the same period.⁵ This may be attributable to the fact that most persons around the study location engaged in various levels of farming at the time of the study. However, there is an undocumented reversal of this trend in the facility as many of the children being seen now have various forms of under nutrition. This will require further research.

This study underscores the high burden of malaria as a cause of morbidity among children in our locale as seen in Benin City also.¹¹ The mechanism of anaemia in malaria infection includes haemolysis, reduced red blood cell production, disseminated intravascular coagulopathy and sequestration.¹² Severe malaria was the leading cause of morbidity that resulted in BT in the current study, in CHER and amongst the population aged > 28 days to five years. This is in tandem with the finding in Benin City where a higher figure was computed.¹¹ A contrary finding was reported in Jos, Nigeria, where malaria accounted for only 1.2% and sickle cell anaemia ranked the highest with 57.7%.⁵ Perhaps, this may be due to the lower temperatures and higher altitude resulting in a lower partial pressure of oxygen in atmospheric air. The findings in the current study underscore the need for improving efforts aimed at reducing the malaria burden in our sub-region.

Severe neonatal hyperbilirubinaemia (NHB) was implicated as the commonest (48.5%) indication for BT amongst the neonates in this study. The newborns are either transfused with blood or receive an

exchange blood transfusion. Exchange blood transfusion is a procedure in which a small volume of blood is removed and replaced with an equal volume of blood sequentially. It is one of the treatment modalities available for severe neonatal hyperbilirubinaemia. It is also used as a treatment modality in overwhelming sepsis and some conditions in sickle cell anaemia. Similarly, NHB was reported as the commonest indication of BT amongst neonates in Jos.¹³ The high burden of NHB underscores the urgent need for interventions which will prevent such high levels of bilirubin requiring exchange BT.

Unlike most studies where sickle cell anaemia was reported as one of the indications for BT, in this study, the co-morbidity or complication in patients leading to BT was recorded as the indication and not just sickle cell anaemia. Lassa fever appears as an indication for BT in this study as against other studies. This is because Lassa fever is endemic in Irrua environs; a late complication of the disease is bleeding. Also, ISTH happens to be the centre of excellence for the management of viral haemorrhagic fevers in Nigeria, thus referrals may lead to a high prevalence of Lassa fever admissions. Perhaps in future studies, Lassa fever may feature in studies from other locations as epidemics of Lassa fever have been reported in other parts of the country. It is important to cut down unnecessary BT due to the complications that may be associated with the procedure.¹³ It is therefore required that, careful consideration and critical evaluation of all the indications for BT is carried out.

This study found a high prevalence of BT amongst under-fives due to severe forms of malaria and NHB amongst the neonates. Since there is a scarcity in the supply of blood which is frequently required during emergencies, it is pertinent to address the causes of the anaemia. Strategies will include reinforcement of the malaria control programme and improving facilities for controlling hyperbilirubinaemia such as intensive phototherapy. Also, public enlightenment to improve health-seeking behaviour and early presentation will help prevent unnecessary BT. This buttresses the need for universal health insurance for the whole populace as it will encourage early

presentation. The scheme should cover blood transfusion when indicated

Conclusion

Due to the high need for blood transfusion in paediatric practice and the associated risks, it is pertinent to ensure the safe and rational use of blood. Malaria control programmes and surveillance for neonatal jaundice need to be strengthened to reduce transfusion rates. These measures will also go a long way to help achieve the Sustainable Development Goals.

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Pattern of contraception usage in the family planning clinic of Kogi State Specialist Hospital, Lokoja, Nigeria

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Abstract

Background: Family planning helps women to prevent unwanted pregnancies and also to control family size. *Objective:* The study aims to determine the pattern of contraception usage in the family planning clinic of Kogi State Specialist Hospital, Lokoja. *Methods:* We carried out a retrospective review of the pattern of contraception usage in the family planning clinic of Kogi State Specialist Hospital, Lokoja between December 2021 and January 2023. We retrieved from the family planning clinic medical records information on the demographic characteristics of clients, parity, marital status and type of contraception usage. The data retrieved were analyzed using simple statistical tools of percentages and charts. *Results:* 660 women presented in the family planning clinic between December 2021 and January 2023. Out of these, the majority of the clients 301/660 (45.6%) had implants, followed by injectables which accounted for 232/660 (35.2%). The lowest was IUCD which accounted for 4.1%. The majority of the women were between 31-35 years of age 192/660 (29%) while the least age was between 51-55 years old which accounted for 0.6%; 89.7% were multipara while 5.8% were primipara and 4.6% were nulliparous. *Conclusions:* Implants were the most common contraception used in 45.6% of clients and the injectable followed this in 35.2%. The utilization of family planning services was mainly by women. There is a need to encourage men to participate in the family planning program for effective service delivery. Future study is advocated to find out why women prefer implants and injectables to other forms of contraception.

Keywords: Pattern, family planning clinic, contraception usage, reproductive health, Lokoja, Nigeria

Introduction

Family planning/contraception methods are key issues in reproductive health¹. Women have used contraception in one form or another for thousands of years. No one method will suit everyone and individual may use different types of contraception at different stages in their lives. The characteristics of ideal contraception are; highly effective, no side effects, independent of intercourse, rapidly reversible, cheap, available, acceptable to all cultures and religions, administration by health care personnel not required and easily distributed. All contraceptives will fail occasionally and some are more effective

than others².

The prevalence of contraception in the United Kingdom (UK) in the early twenty-first century was high. Only 4% of sexually active potentially fertile women who did not wish to conceive reported not using a method of contraception in 2008/2009². The average age of first intercourse in the UK for both men and women are 16 years, and the average age of the first child in 2008 was 30 years³. Since the mean age at menopause is 51 years, most women will need to use contraception for more than 30 years.

Contraception choice varies with age, ethnicity, marital status, facility intentions and education. In the UK as of 2008/2009, oral contraceptive pills, 25% of women and male condoms 25% were the most

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popular methods of contraception. Long-acting reversible (LARC) methods of contraception such as injectables, rings, implants, intrauterine devices and systems were used by 12% of women⁴. Despite high contraceptive prevalence, unintended pregnancy is common. In England and Wales, an abortion rate of 18 per 1000 women of reproductive age was recorded⁵.

In the last four decades, contraceptive practice has risen from 6% to 60%, reducing fertility in developing countries from about 6 to 3 births per woman⁶. However, in low to middle-income countries especially in Sub-Sahara Africa, contraceptive practice remains low while fertility population growth and unmet need for contraception are high⁶. According to WHO's recent statistics, an estimated 204 million women in developing countries would like to delay childbearing but are unable to use any form of contraception⁷.

Available reversible methods of contraception fall into two broad categories, hormonal and non-hormonal. Contraception protects women from high-risk pregnancies, unwanted pregnancies, unsafe abortions and sexually transmitted infections including HIV/AIDS^{8,9}. Contraception is not just about limiting family size and spacing of birth, it is also about promoting and maintaining the well-being of the mother, child and that of the family as a whole.

The current contraceptive prevalence rate among married women in Nigeria is 17%¹⁰ which is the lowest in the continent despite Nigeria's commitment to attaining a 36% prevalence rate by 2018 from 15% reported in 2013¹¹. However, the awareness of contraception among women of reproductive age group in Nigeria remains high despite the low prevalence of contraceptive usage. In the North-West of Nigeria, 82.4% of awareness of contraception was reported¹².

Several factors have been reported to influence a couple's decision on accessing and choices of contraception which include availability, fear of side effects and religious considerations. The desire for a high number of children is traditional to many African cultures and this to date is the practice in several communities in Nigeria, especially in the northern region. Evidence from the Nigeria

Demographic and Health Survey (NDHS) shows that the number of children per family in Nigeria ranges between 3.5 in the South-West to 5.5 in the North-West, with Kebbi State having 6.1 which is the highest for the region. High fertility also contributes the most to maternal and infant mortality figures in the country, with lower figures being reported in areas with lower fertility rates¹³.

Despite the overwhelming advantages of contraceptives to women of reproductive age groups, the side effects such as depression, weight gain, loss of libido, irregular vaginal bleeding or spotting can occur in some women to the degree of discontinuing the contraception.

The pattern of contraception usage in Kogi State Specialist Hospital has never been studied hence the desire to study the pattern of contraceptive usage among our clients who attended the family planning clinic between December 2021 to January 2023. This study was carried out to determine the pattern of contraception usage among clients attending the family planning clinic of Kogi State Specialist Hospital, Lokoja, Nigeria between December 2021 and January 2023.

Materials and Methods

It was a retrospective study among women who attended the family planning clinic of Kogi State Specialist Hospital, Lokoja between December 2021 and January 2023. Lokoja is located in the North-Central zone of Nigeria. Only clients that attended family planning and had contraception in the hospital were reviewed. Their case files were retrieved from the family planning clinic and information on age, parity, marital status and types of contraception used were analysed. The results were reported using simple statistical tools of percentages and charts.

Ethical approval: Ethical approval was obtained from the ethical committee of KSSH, Lokoja, Kogi State for the study.

Results

A total of 660 women attended the family planning clinic within the period of the study and had used contraception; out of these 301/660(45.6%) had implants while 232/660(35.2%) had injectables, then

60/660(9.1%) had pills; 40/660(6.1%) collected condoms, while 27/660(4.1%) had IUCD. The age distribution of the clients is shown in Figure 1. The majority of the clients were in the age range of 31 to 35 years.

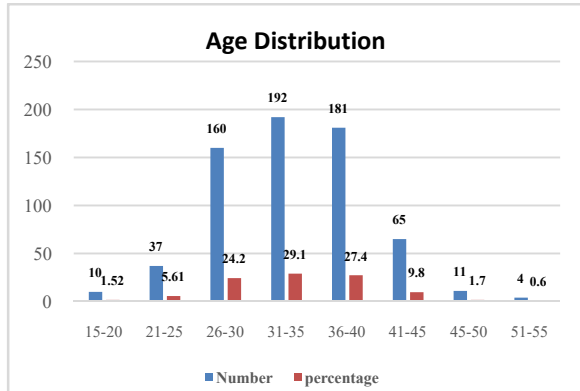


Figure 1: Age distribution

The parity of the clients is shown in Figure 2. The majority of the clients were of the parity 3.

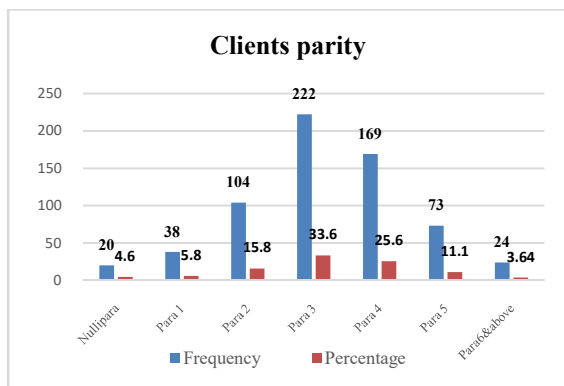


Figure 3 shows the pattern of contraception usage in the family planning clinic. Implant contraception was the most used among the clients accounting for 45.6%.

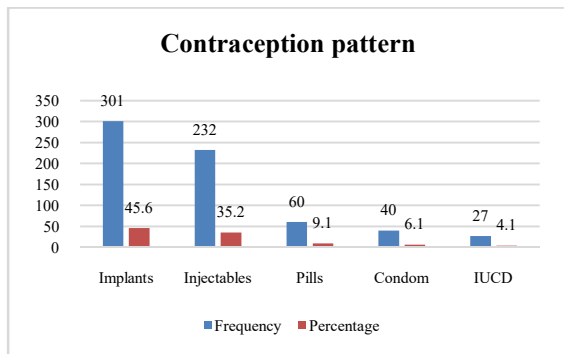


Figure 3: Contraception pattern

Discussion

Contraception which is the act of preventing pregnancy can be a device, a procedure or medication. This study described the pattern of contraceptive usage in the family planning clinic of Kogi State Specialist Hospital, Lokoja between December 2021 and January 2023. 660 clients attended the family planning clinic of the hospital during this period and 100% of them were female. The absence of male clients could be explained by the fact that family planning is conceived by Nigerians as concerns of women and not men, moreso, the location of a family planning clinic in the antenatal area of the hospital might discourage men from seeking family planning there. Of the few men who needed condoms 40/660(6.1%) sent their wives to collect condoms for them.

The study has revealed that out of the 660 women who attended the family planning, the majority of them were between 31-35 years of age which accounted for 29.1% followed by those within 36-40 years of age 27.4%. Almost all the patients 97% were married while 3% were not. Some unmarried clients were single while a few were widows but had children.

Concerning parity, most of the women who reported for family planning were para 3 which accounted for 33.6%, followed by para4 which was 25.6%. This might be due to the current trend of fewer children.

The most commonly used contraception in this study was implants which accounted for 45.6%, this is comparable with findings in Cameroon with 28.4%, though the value here is higher. One is unsurprising as that study was done in a rural area while the index study was carried out in the State capital. This was followed by injectable which was 35.2%. The least contraception use in this study was IUCD which accounted for 4.1%. Pills accounted for 9.1%. No male came for vasectomy as the decision was influenced by sociocultural and religious barriers. The importance of men's education about contraception cannot be overemphasised because it has a huge role to play in improving the uptake of family planning and other health services. Men's awareness and support for the use of contraceptives are associated with their spouses' desire to use

contraception¹⁶. Those that have up to three to four children were the highest 59.2% among contraceptive users compared to lower parity, this result is lower than 71.9% reported in the southeast of Nigeria¹⁷. This is not surprising as the study was prospective while the index study was retrospective.

Conclusions

In conclusion, it is clear from this study that implant contraceptive users are more than other forms of contraception. This is followed by injectable but IUCD had fewer users. There is a need for further study while women prefer implants and injectables more than other forms of contraceptives.

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Social predictors of burnout and strategies employed in the health care setting.

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Abstract

Background Information: Health care workers (HCWs) are prone to burn out, which can have an adverse effect on their person and the patients to whom care is offered. This is dependent on socio-demographic features of workers, as they are part of social groups. Also, strategies employed vary across individuals and health institutions and needs to be assessed to aid future decisions. *Aim:* This study assessed burnout among health care workers, socio-demographic factors, as well as strategies employed. *Methods:* Data was collected from 320 HCWs in a tertiary health care institution using self-administered questionnaires from June through August 2022 and stratified random sampling technique was used. Burnout was assessed using the Oldenburg Burnout Inventory (OLBI). It was a descriptive cross sectional study. Data was collated and analyzed using the Statistical Package for Social Sciences version 21 (SPSS-21). *Results:* Age, gender, religion, marital status, income, cigarette smoking and alcohol consumption were socio-demographic factors significantly associated with burnout among the respondents. Use of stimulants, change in eating habits and change in sleeping pattern were strategies identified among respondents to address burnout. *Organizational measures used to mitigate burnout include:* triaging, clinic separation, change in work schedule, infection control measures, and provision of training of HCWs on infection control. *Conclusion:* Socio-demographic factors are important predictors of burnout among HCWs and various strategies involving individual and organizational approaches are currently been used. There is a need to address these factors using safe and reliable strategies as this would help to improve the wellbeing of health care workers and address burnout leading to a desirable outcome both for the worker and the health care institution.

Key-words: Burnout, predictors, health care workers, Oldenburg burnout inventory

Introduction

Burnout is a work-related stress syndrome resulting from chronic exposure to job stress. The term was introduced in the early 1970s by psychoanalyst Freudenberg and has subsequently been defined by Maslach et al as consisting of three qualitative dimensions.^{1,2} The World Health Organization also defined burnout as a form of chronic occupational stress consisting of three dimensions: (i) exhaustion; (ii) depersonalization or cynicism; and (iii) feelings of inefficacy.³ Freudenberg (1974) conceived burnout to be the "over-committed" or the "super achiever" sickness. The term burnout can be used as a shortcut for a psychological syndrome encompassing

three dimensions: emotional exhaustion (EE), depersonalization (DP), and decreased sense of personal accomplishment (PA), according to the Revision of the International Classification of Diseases (ICD-11).⁴ In this three-dimensional model, EE refers to feelings of work overload and depletion of one's emotional resources; DP refers to one's negative response to other people, both colleagues and patients, in a cynical way; PA is the tendency to negatively evaluate the worth of one's work and feel insufficient regarding the ability to perform one's job. Therefore, healthcare providers experiencing DP can become insensitive and less empathetic when managing their patients, creating distance in their provider-patient contact. DP may negatively impact professionalism. Deficits in PA may lead to feelings of incompetence in professional efficacy, which may impair healthcare professionals' ability to accomplish

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their tasks. Burnout often involves feelings of a lack of control and a diminished sense of PA at work, which further reinforces a sense of being underestimated.^{5,6}

Burnout can occur in any kind of profession, however, healthcare workers seem to be at particular risk for burnout.⁷ This has been associated with work-to-family conflict, unrealistic expectations of patients, ongoing pressure on continuous learning, long working hours, excessive bureaucracy, organizational issues, poor communication among healthcare professionals, and personal issues.⁸ This may have significant negative personal (substance abuse, broken relationships, and even suicide), but also important professional consequences such as lower patient satisfaction, impaired quality of care, and even up to medical errors, potentially ending up in malpractice suits with substantial costs for caregivers and hospitals.⁹

Healthcare worker burnout has been linked to increased patient safety risk, low work professionalism, and low satisfaction with the care encounter. There has been consistency in the association between burnout syndrome in healthcare workers and suboptimal and unsafe care of patients.¹⁰ The prevalence of burnout is increasing and also affects more than half of all practicing physicians.¹¹ The burnout epidemic is detrimental to patient care and may exacerbate the impending physician shortage. Burnout has reached epidemic levels, with a prevalence near or exceeding 50%, as documented in national studies of both physicians in training and practicing physicians.¹²

Therefore, alertness to the phenomenon with prompt recognition together with the development of adequate coping personal and organizational strategies is essential in dealing with this important problem in contemporary healthcare.

Socio-demographic factors are associated with burnout. In a study in the US, burnout was more in the female physician, (70% of female physicians and 61% of male physicians), possible reasons for this could be additional stress factors apart from work such as family commitments and child care.¹³ Various factors have been identified as risk factors with female physicians more likely to experience burnout than their male colleagues.^{14,15} In Nigeria,

professional-grade, age and years in practice, but not specialty, gender, or marital status were associated with the exhaustion domain, whereas only age was associated with the disengagement domain of burnout.¹⁶

In the United States, measures identified among doctors in coping with stress are: eating more, in 29% of doctors, drinking more alcohol, in 19% of doctors, and taking more stimulants and medications in 2%.¹³ Personal measures being envisaged by some physicians to reduce stress were retiring earlier than previously planned in 25% and a career change away from medicine in 12% of physicians. However, a little more than half (51%) said they were not planning any changes.¹³

Various strategies have been employed in different health institutions to curb burnout among health workers however there is still a need to identify socio-demographic factors predisposing to burnout. There is little evidence documenting the relationship between burnout in healthcare workers and socio-demographic characteristics in North-Central Nigeria. Also identifying and addressing challenges as well as strategies to employ would improve both health care workers and patient wellbeing.

Thus, this study will seek to inform future practice and research by assessing burnout among health care workers, socio-demographic factors, as well as strategies employed.

Study Design:

It was a cross-sectional descriptive hospital-based study.

2.2 Study Area

The study was conducted at the University of Ilorin Teaching Hospital (UITH). The UITH, located in Ilorin East local government area of Kwara State, Nigeria, is a tertiary health care institution that provides health care to inhabitants of Ilorin, its environs, and inhabitants from border towns and villages of surrounding states. It also stands as a referral centre for primary and secondary care facilities

Study Population

This consists of health care workers (doctors, nurses, pharmacists, and laboratory technicians) male and

female at UITH, during the studied period and who satisfied the inclusion criteria.

Inclusion and exclusion criteria

Inclusion Criteria

All health care workers male and female at UITH, during the studied period who are 18 years and above.

Exclusion criteria

Health care workers that were too sick to participate in the study, in order not to delay early access to prompt care.

Sample size: To determine the minimum sample size (n) to test the hypothesis, accuracy, confidence level, and prevalence rate need to be considered. A prevalence of burnout among healthcare workers of 69% from the study by Nwosu et al in Enugu, Nigeria, was used.¹⁷ For precision, the desired degree of accuracy (d) or margin of error allowed is 0.05. To ensure that the results obtained from the sample population have a 95% confidence level (z) of representing the true population, a value of 1.96 was used.

The formula for determining the minimum sample size for health studies used by Leslie Kish will be used, which is:¹⁸

$$n = Z^2pq / d^2$$

n = minimum sample size

z = standard normal deviation or 95% confidence level assuming a normal distribution (1.96)

p = estimated prevalence rate of burnout among health care workers (69% or 0.69)⁴ q is the proportion of healthcare workers that do not have burnout.

However since the study population is less than 10,000 (1930), the sample size is adjusted using this formula:¹⁸ $nf = n/1 + (n/N)$

The final sample size was 312

A total of 320 HCWs participated in the study.

The financial burden of this research was borne by the authors. The study was approved by the Ethical Review Committee of UITH. Each participant voluntarily gave informed consent.

Data was collected over three months and analyzed over a month.

Sampling Technique

The stratified random sampling technique was used to recruit eligible participants. This was because the participants were non-homogeneous groups; hence sample size was proportionally allocated.

Data collection and instruments

Data were collected using the structured and semi-structured interviewer-administered questionnaires, which included socio-demographics, and burnout assessment using the Oldenburg Burnout Inventory (OLBI) tool. The OLBI is a reliable and valid measurement instrument for the assessment of burnout.¹⁹ It has two subscales exhaustion and disengagement (from work).²⁰

OLBI can be used to measure burnout (with its dimensions) and work engagement as bipolar constructs.²¹ In addition, it provides high-scale reliability (Cronbach's alpha=0.63) as well as on its subscales, exhaustion (Cronbach's alpha=0.87) and disengagement (Cronbach's alpha=0.81).¹⁹ It has been used in Nigerian studies as well.^{16,17} To identify the burnout groups, mean scores ≥ 2.25 on the exhaustion domain will be considered as having high exhaustion, while those who scored less than 2.25 will be regarded as having low Exhaustion. For the disengagement domain mean scores ≥ 2.1 will be considered as high while those who scored less than 2.1 will be regarded as having low disengagement.

These cut-off scores are adapted from a previous study on burnout among Swedish healthcare workers conducted with the OLBI.²² The mean score for each domain will be obtained by dividing the total scores for the items in the domain by the number of items in the domain; which is eight (8) in each case. The following categories were obtained:

Burnout group: high exhaustion and high disengagement; Exhausted group: high exhaustion and low disengagement; Disengaged group: high disengagement and low exhaustion; Non-burnout group: low disengagement and low exhaustion

Pre-test

The questionnaire was pre-tested in the general outpatient clinic of General Hospital, Ilorin, with 10% of the sample size and necessary adjustments made.

Data analysis:

The collected data was sorted, coded, and entered into the computer for analysis using the Version 21 software packages of the Statistical Package for Social Sciences (SPSS-21). Results were presented using frequency tables and charts. Frequency distribution was generated to reveal percentages and proportions of the various variables. Chi-square was also used to assess the association between burnout and socio-demographic factors. The level of significance of this study was set at 5% (p <0.05).

Results

Socio-demographic Characteristics of the Participants

A total of 320 healthcare workers (HCWs) participated in the study. Table 1, shows the socio-demographic characteristics of respondents. HCWs aged less than 30 and between 31- 40 years constituted a greater percentage of the respondents 115(36%), while only 6(2%) were above or equal to 61 years of age with a mean age of 40 ± 9.8. The gender distribution revealed a preponderance of female respondents of 189 (59%) with a female to male ratio of 1.4:1. Married individuals constituted 68% of respondents. The Yorubas(94%) and individuals with 1-5 children (96%)constituted the highest proportion of the HCWs. A large proportion of the workers earned above 30,000 (92.5%). And most of the HCWs were nonsmokers and did not take alcohol (96%).

Prevalence and Pattern of Burnout among Respondents

Table 2 shows the prevalence of burnout amongst HCWs. The study revealed a prevalence of 71%, as 227 of the respondents had burnout, while 93 were without burnout. Among those without burnout, 8% (26) were disengaged, 14% (45) were exhausted and 7% (22) had no burnout.

Table 1: showing the socio-demographic characteristics N=320

Variable	Frequency(n)	Percentage (%)
Age Group		
≤30	115	36
31-40	115	36
41-50	51	16
51-60	33	10
≥61	6	2
Gender		
Male	131	41
Female	189	59
Religion		
Islam	175	54
Christianity	143	44.7
Others	2	0.6
Marital Status		
Married	219	68
Singles	91	28
Separated or Divorced	5	2
Widowed	5	2
Ethnic Group		
Yoruba	301	94
Igbo	7	2
Hausa	10	3
Others ^a	2	1
Number of Children		
0	2	0.6
1-5	307	96
6-10	6	1.9
above 10	5	1.6
Income		
≤30,000	24	7.5
>30,000	296	92.5
Smoking Status		
Current	6	2
Former	6	2
Never	30	96
Alcohol Status		
Current	10	3
Former	2	1
Never	308	96

a: other ethnic groups found in Kwara such as Nupe, Bariba, Fulani

Table 2: Prevalence and pattern of burnout N=320

	Frequency	Percentage (%)
Burnout Present	227	71
Disengaged	26	8
Exhausted	45	14
No Burnout	22	7

Table 3: Showing the Relationship between socio-demographic factors and burnout N=320

Socio-Demographic	Burnout		Df	X ²	P value
Age group	Present (%)	Absent (%)			
≤30	112(35%)	3(1%)	5	75.94	0.00
31-40	58(18%)	57(18%)			
41-50	30(9%)	21(7%)			
51-60	22(7%)	11(3%)			
≥61	5(2%)	1(0%)			
Gender					
Male	108(32%)	23(19%)	3	10.512	0.04
Female	119(39%)	70(10%)			
Religion					
Christian	97(30%)	46(14%)			0.01
Islam	128(40%)	47(15%)	2	4.2187	
Other	2(1%)	0(0%)			
Marital Status					
Married	48(15%)	43(13%)			
Singles	5(1.5%)	0(0%)	3	87.025	0.00
Separate or Divorce	5(1.5%)	0(0%)			
Widowed					
ETHNIC GROUP					
Hausa	4(1%)	3(1%)			
Igbo	215(67%)	86(27%)	1	15.432	0.62
Yoruba	2(1%)	0(0%)			
Others					
Number Of Children					
0	0(0%)	2(0.6%)			
1-5	216(68%)	91(28%)			
6-10	6(1.9%)	0(0%)	3	29.250	0.05
>10	5(1.5%)	0(0%)			
INCOME					
≤30,000	16(5%)	8(2.5%)	2	231.2	0.00
>30,000	211(66%)	85(26.5%)			
SMOKING					
Current	4(1.2%)	2(0.6%)			
Former	4(1.2%)	2(0.6%)	2	1.487	0.00
Never	219(68.4%)	89(28%)			
ALCOHOL					
Current	3(0.9%)	7(2.1%)			
Former	2(0.6%)	0(0%)	5	32.411	0.04
Never	222(69.4%)	86(27%)			

Table 4: Logistic Regression

Variable	Coef	S.E	Odds Ratio	95% CI		p-value
				Upper	Lower	
Gender						
Male	1.001	2.071	0.401	0.144	0.763	
Females	1.059	2.679	0.884	0.861	0.891	0.03
Age						
≤30	2.960	13.224	0.273	0.179	0.132	
31-40	-13.45	0.911	1.726	0.298	0.282	
41-50	-4.0326	1.4131	0.226	0.111	0.177	
51-60	1.0223	0.0221	0.116	0.261	0.305	
≥61	-1.927	0.2144	0.118	0.971	0.335	0.00
Religion						
Christianity	-1.017	1.874	0.812	0.00	0.00	
Islam	-1.608	2.194	0.922	0.00	0.00	
Others	0.5122	2.121	0.192	0.00	0.00	0.00
Marital status						
Single	18.728	40189.7	0.245	0.00	0.00	
Married	-	40193.8	0.00	1.000	0.00	
	19.513					
Widow	-	40193.8	0.00	0.00	0.00	
	21.006					
Separated	19.619	44931.7	0.00	0.00	0.00	0.00
Marriage						
Monogamy	1.446	2.332	0.922	0.641	0.291	
Polygamy	-1.260	1.881	0.146	0.441	0.119	0.03
Education						
Primary	-1.544	4.186	0.213	0.21	0.12	
Secondary	2.296	0.982	0.184	0.391	0.201	
Quranic	7.524	1.010	0.212	0.181	0.122	
Tertiary	3.272	0.933	0.155	0.133	0.196	0.03
Ethnic group						
Hausa	-21.717	14200.5	0.388	0.206	0.071	
Igbo	20.005	40192.9	0.311	0.112	0.021	
Yoruba	22.018	40192.9	0.184	0.109	0.129	0.09
No of Children						
0	-17.435	9009.2	0.719			
1-5	-19.541	17.427	0.009	0.03	0.00	
6-10	-1.127	2.899	0.904	0.65	0.00	
>10	1.008	1.704		0.010	0.00	0.01
			0.281			
Smoking						
Current	738	2.001	0.00	0.00	0.00	
Former		2.502		0.00	0.00	
	1.596		0.89			
Never	1.686	.001	0.77	0.00	0.00	0.00
Alcohol						
Current	-10.109	2.209	0.126	0.00	0.00	
Former	0.155	1.098	0.665	0.00	0.00	
Never	0.187	11011	0.198	0.00	0.00	0.00

Relationship between socio-demographic factors and burnout

Burnout was highest among age group less than 30 years (35%) and least among workers above 60 years (2%). This relationship was statistically significant. The females had a higher prevalence of burnout (39%) compared to males (32%), this was statistically significant. Burnout was highest among Muslims (40%) and the married workers (53%). Workers with income more than 30, 000 naira minimum wage (66%), those who never smoked (68.4%) or took alcohol (69.4%) had the highest prevalence of burnout. These associations were statistically significant. The ethnic group and number of children had no statistically significant association with burnout.

Logistic Regression

On Logistic Regression, age, gender, religion, marital status, type of marriage, education, smoking, and alcohol consumption were further shown as predictors of burnout.

Table 5: Measures used to mitigate burnout among respondent

Personal Factors	Yes	No	Total
Use of stimulant	(86) 26.88%	(234) 73.13%	100%
Change in my eating	(181) 56.56%	(139) 43.44%	100%
Change in my sleep	(208) 65.00%	(112) 35.00%	100%
Organizational Measures			
Triaging	(270) 84.38%	(50) 15.63%	100%
Clinic separation	(226) 70.63%	(94) 29.38%	100%
Change in work schedule	(218) 68.13%	(102) 31.88%	100%
Infection prevention	(251) 78.44%	(69) 21.56%	100%
Providing clinicians with infection prevention and control training	(244) 76.25%	(76) 23.75%	100%

Measures used to mitigate burnout

Among the HCWs, 26.88% used stimulants to stay awake and prevent burnout at work, 56.56% attested to changing their eating habit and 65% had to change their sleeping pattern due to burnout.

Also, in the hospital, measures used to mitigate burnout include: Triaging, clinic separation, change in work schedule, infection control measures, and provision of training of HCWs on infection prevention and control. This was reported by 84.38%, 70.63%, 68.13%, 78.44% and 76.25% of HCWs respectively. This shows that triaging was the most used approach by the hospital to mitigate burnout.

Discussion

Burnout was highest among age group less than 31 and least among workers above 60 years.²³ This relationship was statistically significant. This is similar to findings by Salihu et al at UITH in a study among resident doctors where they found that being a younger resident doctor was a significant predictor for burnout²⁴ Likewise, Nwosu et al, in a study among physicians in five tertiary health institutions in Nigeria, reported that Physicians' age was associated with the exhaustion domain and disengagement domain of burnout.¹⁶ Similarly in a systematic review, Gomez- Urquiza et al reported that younger age was a significant factor in the emotional exhaustion and depersonalization of nurses.²⁵ This has been found to be linked with some complications in this age group for example, in Tanzania, Tsai et al found that young female participants and young doctors/nurses with burnout had a higher odd ratio of metabolic syndrome compared to other groups (OR = 2.43 and 2.32, $p < 0.05$). A possible reason for high burnout in the age group in the index study could be because this group consists of young and active individuals who would have been engaged in more activities at work than workers in other age groups, amidst a massive exodus of health care professionals and the COVID 19 pandemic.

The females had a higher prevalence of burnout (39%) compared to males (32%), this was statistically significant. This is comparable to findings in the USA where a higher proportion of females had burnout compared to males (70% of female physicians and 61% of male physicians).¹³ In Ekiti Nigeria, Adebayo et al found that gender had a significant effect on burnout as female health workers were more vulnerable to burnout than their male counterparts.²⁶ Various factors have been identified as reasons why female health workers are more likely to experience burnout than their male colleagues.^{14,15}

Possible reasons for these findings in the index study and findings in the USA could be additional stress factors apart from work such as family commitments and child care.¹³ In China, a mid-level professional title and having an administrative position were predisposing factors for burnout among female psychiatric nurses.²⁷ On the contrary, Zhang et al reported that the rate of burnout in male psychiatric nurses (32.24%) was significantly higher than that in female psychiatric nurses.²⁷ This along with the perceived negative impact of the COVID-19 pandemic on medical work were significant factors in the study by Zhang and his colleagues.²⁷

Married healthcare workers constituted the highest proportion of participants with burnout in the index study (53%). This is similar to findings by Zhang et al, who reported that being married was associated with more burnout in female psychiatric nurses.²⁷ Likewise, in Ghana, Odonkor et al, revealed that health workers who are parents or married tend to suffer burnout more than those who are single.²⁸ In China, according to Cheng et al, marriage was an independent risk factor for personal burnout among HCWs; however, the effect of marriage on workplace burnout in China was non-significant after controlling for risk factors, this is different from findings in the index study.²⁹ Possible reasons for the difference in the index study and the study in China may be the methodology used as the Copenhagen Burnout Inventory was used in China while the Oldenburg Burnout Inventory was used in the index study. Hence, helping healthcare workers maintain well-being in marriage or family living may be effective in decreasing burnout.

Workers with income more than 30, 000 naira minimum wage (66%) had more burnout. This is in contrast to findings in Japan where long-term care workers with high compensation levels were found to be more likely to have low burnout levels.³⁰ Possible reasons for findings in the index study include: having to do other jobs to make more income due to the low income from the hospital work. Also, workers in these group may have to run more errands or take more night shifts.

Those who never smoked (68.4%) constituted the highest proportion of participants with burnout. This is in contrast to a cross-sectional survey by Xia et al

in China, which revealed that smokers were more likely to experience burnout.³¹ It is also different from findings in Serbia where cigarette smoking was significantly associated with cynicism, with smokers often showing higher cynicism compared to non-smokers (40.7% vs. 32.3%; $p = 0.023$).³² Possible reasons for the differences in the result found in the index study compared to others may be differences in the socio-demographics of the study population and that of others.

Those who never took alcohol (69.4%) had the highest prevalence of burnout. This is different from findings by Oriskofich et al. who reported that surgeons who were burned out (odds ratio, 1.25; $P = .01$) were more likely to have alcohol abuse or dependence as the emotional exhaustion and depersonalization domains of burnout were strongly associated with alcohol abuse or dependence.³³ Also, in a qualitative descriptive study in Australia, several participants with burnout described increased alcohol consumption because of the COVID-19 pandemic, particularly due to the stress of working in an environment where resources were scarce. Workplace factors such as overtime, missed breaks, and heightened workload were all described as driving stress, and in turn increased alcohol consumption.³⁴ Possible reasons for the finding in the index study could be that alcohol consumption is used as a means of relief from stress as was seen in the study by Oriskofich and Searby, however, those who never consumed alcohol in the index study had persistence of burnout as reported.

Various wellness strategies can be applied by HCWs to cope with the symptoms of burnout. These include: having good relationships; spiritual practices; change in work attitudes; being involved in education and/or research; managing schedule and discontinuing unfulfilling aspects of practice.⁹ In the index study, 26.88% of the HCWs used stimulants to stay awake and prevent burnout at work, 56.56% attested to changing their eating habit and 65% had to change their sleeping pattern due to burnout. These methods have also been reported in other studies as means of controlling burnout.^{9,35} Likewise, maintaining basic self-care including eating a nutritious diet, getting at least 30 minutes of daily exercise, and creating a good sleep routine has been highlighted as strategies to curb burnout.³⁵ Similarly, in the United States,

measures identified among doctors in coping with stress are: eating more, in 29% of doctors, drinking more alcohol, in 19% of doctors, and taking more stimulants and medications in 2%.¹³ However in the USA, retiring earlier than previously planned (in 25% of physicians) and a career change away from medicine (12% of physicians) were identified strategies for burnout control.¹³ The desire to work despite the consequences of burnout to make a living and provision of self-fulfillment may be reasons for the use of the above measures in the index study as well as other studies. Self-care approaches such as exercise and eating a nutritious diet may be beneficial to the workers' health.

Systematic reviews suggest that organization-based interventions are more effective in reducing physician burnout than interventions targeted at individual physicians.⁹ In the index study, organizational measures used to mitigate burnout include: triaging, clinic separation, change in work schedule, infection control measures, and provision of training of HCWs on infection control. This may have been emphasized because COVID-19 was a pandemic at the time. Highlighted measures in other studies are: leadership traits, the latitude of control and autonomy, collegiality, diversity, teamwork, top-of-license workflows, electronic health record (EHR) usability, peer support, confidential mental health services, work-life integration and reducing barriers to practising a healthy lifestyle.³⁶ Organizational attention to HCW's well-being can improve the quality of care and the patient experience, increase HCW recruitment, retention, and productivity, and mitigate some risks healthcare organizations face as they grow.

Conclusion

Burnout is highly prevalent among HCWs and has been associated with negative outcomes for HCWs, patients, and health-care organizations. The significant socio-demographic predictors of burnout were age, gender, religion, marital status, type of marriage, education, smoking, and alcohol consumption. Reducing burnout and increasing workers' well-being is of utmost importance. Risk situations should be identified and preventive measures should be implemented early to avoid future harm. Also, additional prospective studies to

identify individual and organizational interventions that can promote wellness and evaluate its effect on productivity, patient care, and patient satisfaction are paramount. Based on our findings, it is recommended that measures should be put in place in hospitals to assess burnout and burnout levels to ensure people who experience burnout are identified and safe means of control are made readily available to all.

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Giant Palmar Lipoma: An Unusual Lipomatous Location with Complex Presentation.

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Abstract

Lipomas, also known as “innocent tumours” due to their slow-growing, painless non-infiltrative nature. They usually grow to sizes $\leq 2\text{cm}$ in the hand and upper limb in general. Thus, lipoma that exceeds 5cm in size in the hand is referred to as a “giant lipoma”. This case report is that of a multi-compartmental, well-encapsulated giant lipoma of the left hand of a 67-year-old right-handed woman. It occupied the thenar and mid-palmar compartments of the left hand stretching the digital nerves of the thumb, index and middle fingers causing paraesthesia and difficulty with using the affected hand. The mass was excised entirely through a volar longitudinal proximal palmar skin crease approach. The patient had early physiotherapy and has achieved resolution of all symptoms and achieved satisfactory hand function three months postoperative period.

Keywords: Giant lipoma, lipoma of the hand, marginal excision biopsy

Introduction

Lipomas are common tumours of mesenchymal origin containing mature adipocytes and represent the single most common soft tissue tumour of the body.¹ Theoretically, lipomas are ubiquitous and can involve any tissue and/or organ of the human body.^{2,3} However, despite the moderate amount of fat in the hand, lipoma infrequently involve the hand representing about 3.8%-4.9% of hand tumours.^{3,4} Lipoma of the hand can be located in the subcutaneous, subaponeurotic or intramuscular locations.⁴ However, the subaponeurotic lipoma is the most common type involving the hand.⁴ This case report is interesting due to the rare giant

multicompartmental involvement and multiple symptoms presented by a usually asymptomatic benign condition of the human hand.

Case Report

A 67-year-old right-handed female trader presented with a year history of progressively enlarged swelling of the left hand. The swelling was initially painless but became painful with associated tingling sensation over the radial three-and half digits and difficulty to use the left hand within the last three months prior to presentation. No family history of similar swelling or trauma to the affected left hand. On clinical examination, there was an irregularly shaped mass on the thenar eminence with some mid-palmar extension measuring about 6cm X 4cm and has normal overlying skin (figure 1).

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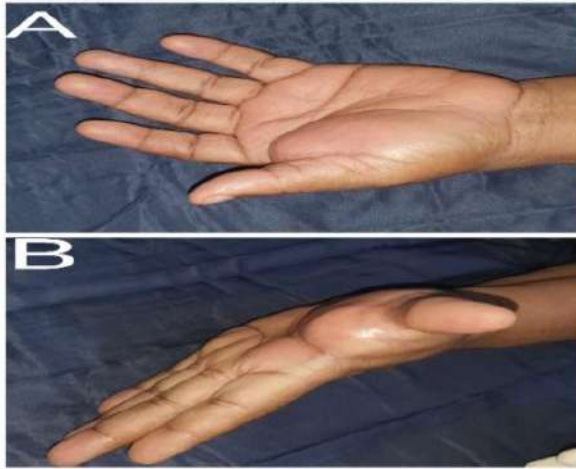


Figure 1: Preoperative appearance of the giant lipoma of the left hand. A: anteroposterior view. B: Oblique view.

It was soft, bosselated, non-tender and freely mobile. There was tenderness and hypersensitivity over the radial three and half digits of the left hand. Plain radiograph of the left hand showed a soft tissue shadow in the thenar region with extension across the mid-palmar region, the bony outlines were normal. The patient had excision biopsy of the mass performed under WALANT (wide awake local anaesthesia no tourniquet).

Operative Technique

The surgery was performed under WALANT. A vertical palmar skin crease incision was made using No. 15 scalpel blade knife, this was developed through the subcutaneous layer by sharp and blunt dissection to expose the mid-palmar fascial and thenar muscles. The skin flaps were retracted and anchored in place using Nylon 0 stay sutures, adductor pollicis muscle separated from flexor pollicis brevis. The intraoperative finding was that of a well-encapsulated, subfascial, multi-lobulated, yellowish fatty mass located in the thenar and mid-palmar regions of the left hand (figure 2).

It measured 6cm in length and weighed 20g and associated with stretching and elongation of the digital nerves to the radial three digits. Proximally it extended into the distal aspect of the left carpal tunnel and hence it was also released. The mass was meticulously separated from the overlying palmar fascia and contiguous tendon sheaths. The obviously stretched neurovascular structures were identified and preserved. The mass was removed en masse and sent for histopathological analysis. Haemostasis was achieved by ligating bleeding vessels, wound closed using Prolene 3/0 suture in a

simple interrupted fashion and firm wound dressing applied (figure 3).



Figure 2: Intraoperative appearance of the giant lipoma of the left hand. A: separation of the adductor pollicis and flexor pollicis brevis muscle to expose the giant lipoma. B: Complete marginal excision of the fatty mass.



Figure 3: Immediate postoperative appearance of the left hand showing the excised lipomatous tissue and wound

Postoperative Period

The patient was placed on analgesics, anti-inflammatory drugs and discharged home on a broad-arm sling for ambulatory elevation of the left hand. She was commenced on passive and active physiotherapy on postoperative day 14, and has since achieved satisfactory improvement of the left hand characterised by resolution of all presenting symptoms. Histopathological analysis showed encapsulating segments of proliferating mature

adipocytes separated into lobules by thin fibrous connecting tissue (figure 4).

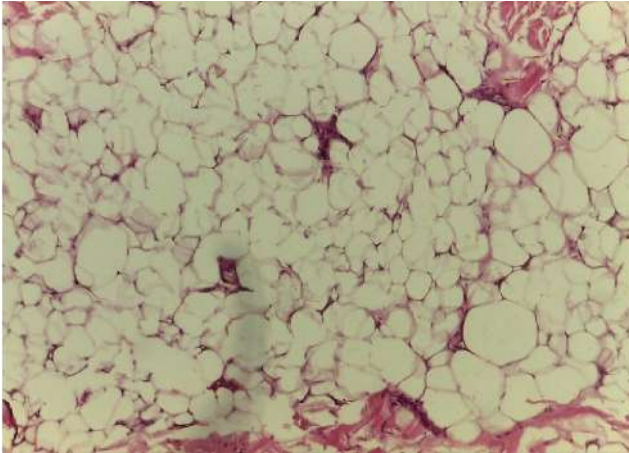


Figure 4: Mature fat cells separated into lobules by thin fibrous connecting tissue.

Discussion

Lipomas are the commonest type of benign soft tissue tumours of the human body accounting for 16% of mesenchymal tumours.^{5,6} They are known for their ubiquity, occurring in the upper body and accounts for 15%-20% of tumours of the head and neck region.⁶ Lipoma of the hand is rare with a reported prevalence of 3.8%-4.7% of tumours involving the hand.^{3,4,6} These tumours can occur in any age group but are usually diagnosed between the fifth, sixth and seventh decades of life (age 50-70 years) which is consistent with the age of our patient: 65 years.^{4,6,7} They are rare in children. Neural fibrolipomas, a variant of lipoma which typically presents during early childhood and young adulthood and thus, is the commonest type of lipoma found in children.⁶ Obese individuals are more likely to develop lipomas.^{7,8}

A “giant lipoma” is defined as a lipoma that is more than 10cm in length or weighs more than 1kg.⁶ However, a “giant lipoma of the hand” is that which is more than 5cm in length, or weighs more than 50g.³⁻⁵ Most lipomas of the hand will qualify to be classified as a “giant lipoma” on the basis of the length criterion and rarely on the weight criterion due to the restricted osteofascial space.

The aetiology of lipoma is not well understood. But there have been several theories postulated for it and this includes the genetic, metabolic and traumatic

aetiopathogenetic theories.^{2,6} Approximately 5% of patients with lipomas have family history of lipoma and it has been known to be inherited with an autosomal dominant pattern.^{6,7} Some families demonstrate an autosomal dominant mode of inheritance consistent with familial multiple lipomatosis. A simple dominant pattern has also been seen in Dercum’s disease (adiposis dolorosa), which is typically observed in obese, postmenopausal women in whom numerous painful lipomas occur primarily around the hips and thighs.⁹ Furthermore to support the genetic basis of lipomas, multiple lipomatous lesions are also components of several rare congenital syndromes such as Cowdens, Bannayan-Zonana and Proteus syndromes.⁹ Lipomas are associated with translocation and rearrangement of the 12q13-15 and 6p13q chromosomal region.⁶

The metabolic theory has been explained by the fact that lipomas are more common among individuals with obesity and in women. This is due to the presence of more fat in women and individuals with obesity.^{6,9} Although, lipomatous tumours increase in size with weight gain, their sizes do not decrease during the period of weight loss.⁶ The link between trauma and the development of lipoma is explained that the process of inflammation following a trauma induces lipoma formation through the release of several growth factors, cytokines and inflammatory mediators which promotes preadipocytes differentiation into mature adipocytes (lipogenesis) to form a clinical apparent mass.^{6,9} It has also been suggested that traumatic fat necrosis and extravasation of blood into traumatised soft tissue cause preadipocytes to differentiate and form lipoma.^{6,9} Also, microhaemorrhage and focal release of cytokines secondary to bleeding diathesis may trigger lipomatous growth.⁹ Furthermore, a spontaneous increase in partial thromboplastin time has been observed in patients with post-traumatic lipomas.^{9,10}

Lipomas have the ability to insulate themselves into small recesses and thus produce tumours of any size or shape by infiltration of spaces not tightly bound by protecting sheaths and fascia.³ This is so with lipomas of the hand which occur in various anatomic locations within it subfascially in the deep palmar space.¹⁰ The deep palmar space is divided into five zones and these are UMP (ulnar metacarpophalangeal), RMP (radial metacarpophalangeal), hypothenar, central (mid-palmar) and thenar spaces (figure 5).⁸

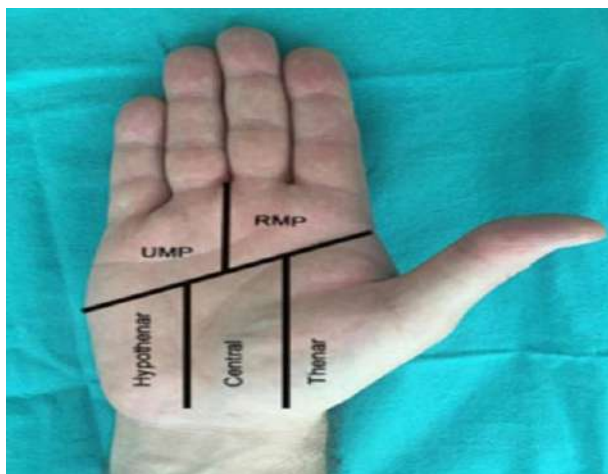


Figure 5: Diagrammatic illustration of the five compartments of the deep palmar space.

The long-term progression of lipoma involving the hand is due to the slow and painless growth pattern of it. The symptomatology of lipomas of the hand is determined by its location, size, histological type, and involvement of adjacent structures. Lipomas are usually slow-growing tumours, so they remain asymptomatic for a long time.⁵ Patients seek medical attention when the tumour becomes large and affects hand function (as occurred in our patient), or if they present compression-related clinical signs, especially at the level of the nerves, i.e., paraesthesia, restricted range of movement and difficulty with usage of the affected hand (which was also part of the presenting complaints of our index patient).⁷ Lipoma growing in confined spaces like carpal tunnel or tendon sheath may cause trigger finger, restricted mobility, muscle atrophy, nerve compression, nerve stretching/elongation, or bony erosion.⁶⁻⁸ The compression exerted by lipoma on the neural elements and relatively large volume tumour in an unyielding compartment can cause pain and hypersensitivity disorders.⁶ Giant lipomas with a mid-palmar or thenar location can cause nerve elongation and sensitivity disorders, and tendon rupture.⁶

The diagnosis of lipoma of the hand is a diagnosis of exclusion since other differential tumorous conditions of the hand are commonly encountered than lipoma. Other differential diagnosis includes ganglion cyst, giant cell tumour, fibroma and arteriovenous malformations. However, a good clinical acumen and radiological examination can simplify the diagnosis of lipoma of the hand. Plain radiograph of the hand shows a soft tissue

shadow and presence of bony erosion (when there has been a chronic bony location). In most cases, ultrasound examination can confirm the diagnosis of lipoma of the hand with the lipoma appearing as a homogeneous, hyperechoic and well-defined mass without posterior enhancement or a Doppler signal.^{6,8} For giant lipomas of the hand, magnetic resonance imaging (MRI) scan is the image modality of choice having better soft tissue resolution.^{7,11} The MRI finding is that of a well-defined fine, homogeneous encapsulated mass with a predominantly lipomatous signal (hypersignal on T1- and T2-weighted images, and hyposignal on STIR images).⁶ Fine septa are irregularly distributed within the tumour having discrete gadolinophilia due to the presence of blood vessels in the septa.¹⁰ Features such as increased nodularity, globular, or nonfatty areas as well as decreased fat composition are suggestive of malignant transformation of a lipoma to a liposarcoma.^{10,11} Other features that suggest the risk of malignant transformation include giant lipoma, intra- and/or inter-muscular location, and retroperitoneal lipomas.

Histologically, lipomas are composed of mature adipose tissues separated by thin fibrous septa and blood vessels may be present within the fibrous septa and typically surrounded by a fibrous capsule (figure 6).²



Figure 6: Histological features of lipoma showing mature adipocytes with compressed eccentrically placed nucleus (Signet ring sign) and thin fibrous septa

Other variants of lipomas include neural fibrolipomas, intramuscular and intermuscular lipomas, angioliipoma, chondrolipoma, osteolipoma and spindle cell or pleomorphic lipoma.⁶ Neural fibrolipomas are composed of fibrofatty tissue that surrounds and/or infiltrates local

nerves. Lipomas that have a mixture of adipose tissue and skeletal muscle are considered intramuscular and/or intermuscular lipomas. Angiolipomas show an increased vascular component that can account for up to 5%-50% or more of the tumour volume and are usually multiple painful masses.^{2,6} spindle cell lipomas consist of spindle cell and adipose tissue and are commonly found in the subcutaneous layer with possible extension into the dermis.²

Small asymptomatic lipomas of the hand may be observed and followed up without intervention. Beneficial to small lipomatous lesions of the hand is mesotherapy which involves the intralesional injection of a mixture of phosphatidylcholine or sodium deoxycholate to achieve lipolysis.⁶ Surgical excision biopsy is indicated in the presence of discomforting pain, difficulty with effective usage of the affected hand, features of compressive neuropathy, bony erosion and cosmetic disfigurement.¹² Due to the complex anatomic organisation of the hand, a delicate and meticulous dissection must be performed during the surgical excision of the mass. A marginal excision biopsy is usually adequate for en masse extirpation of the tumour and symptoms resolution and ensures a limited chance of recurrence.⁹ For patients with complex presentation such as carpal tunnel syndrome, decompressive intervention such as division of the flexor retinaculum and marginal excision of the tumour is appropriate.

Conclusion

Lipomas are benign fatty tumours that rarely occur in the hand. They typically present as slow-growing painless multicompartamental tumours. Their symptomatology in the hand is dependent on their size, location, histological type and involvement of adjacent structures. Ultrasound scan of the involved hand is beneficial in the preoperative evaluation of the patient. However, where

available, MRI scan of the hand is the gold standard of preoperative radiologic evaluation of the lesion. The options of treatment of lipoma of the hand include mesotherapy, intralesional injection of phosphatidylcholine or deoxycholate, and meticulously performed marginal excision biopsy. When compression neuropathy is involved in the patient's complaint, division of the involved retinaculum is appropriate.

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