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Examining the Prevalence of Otitis Media and its Influencing Factors in Patients at Hoima Regional Referral Hospital

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ABSTRACT

This study aims to investigate the prevalence of Otitis Media and its factors influencing its occurrence among patients at Hoima Regional Referral Hospital. Otitis Media is a significant contributor to childhood mortality in developing countries like Uganda, often due to late-presenting intracranial complications. The majority of participants were HIV-negative, with 44.8% reporting positive results. 67.6% had co-morbities, while 32.4% had no co-morbidities. Most participants denied exposure to cigarette smoke, with 65% denying exposure. A greater percentage were well-nourished and breast-fed, with 67/85 and 76.8% respectively. A statistically significant relationship was found between HIV/AIDs status, co-morbidities, malnutrition/nutritional status, exposure to cigarette smoke, and breastfeeding. This information could be useful in planning, resource allocation, and mitigating identified risk factors, ultimately improving patient outcomes.

Keywords: prevalence, otitis media, occurrence

INTRODUCTION

A very dreadful complication of Otitis Media (OM) is hearing loss and even so, its worst complication is death. The world health organization describes it as one of the preventable causes of hearing loss. Otitis media is known to be a spectrum of disease ranging from an acute non-suppurative otitis media to chronic suppurative and non-suppurative patterns, particularly when it is not treated or when partially treated [1, 2]. It is also defined as inflammation in the middle ear cleft, the effusion of fluids into the middle ear occurs as a result of an infection which in turn may be associated with either presence or absence of tympanic membrane perforation [3]. Otitis media is one the commonest ear conditions; this being very evident among children [4].

In developing countries, such as Uganda, Otitis Media is extremely common and remains a major contributor to childhood mortality, resulting usually from late presenting intracranial complications. However, there is very insufficient data on the scale of this malady. It's current prevalence in Uganda, even when estimated can hardly be found. Very little can be said about how many annual hospital visits are accounted for by this illness in the country.

Available studies connected to ear conditions and hearing loss have been conducted in Masindi, Wandegeya-Mulago Hospital, Mbarara Regional Refferal Hospital and in Kawempe and- credit to all these studies. In spite of all these efforts, however, the scale of the burden of Otitis media in the country cannot be traced. This has partly stemmed from the centralization of research –thus to say, the conduction of most of the research within the central part of Uganda as evidenced by the examples given above, or perhaps research on the subject matter has been conducted whose results isn't readily accessible and last but not least, most of the research focused on hearing loss and not the particular condition of OM. In Hoima, and more specifically, Hoima Regional Referral Hospital, research findings from studies of the illness, if any, have been sought in vain. This means that very little is known about the statistical prevalence of Otitis Media in this hospital, the district, the entire Albertine region and the country at large [5, 6]. The prevalence or in other words, the burden of Otitis

Media cannot be adequately accounted for by current research, this implies, more inquiry and knowledge about the factors influencing its occurrence, more-so, among patients at Hoima Regional Refferal Hospital is required. This study will try to explore the various factors influencing the occurrence of this ailment among patients seeking care at Hoima Regional Refferal Hospital and also try to determine its prevalence within the same period. Both a descriptive analytical and descriptive cross-sectional studies shall be employed during this study. A cohort retrospective study shall also be put to use.

METHODOLOGY

Research design

The research design will be both a descriptive [7] and analytical research using quantitative and qualitative approaches. The study shall also be inclusive of patches of cohort study especially in retrospect.

Study population

The study population will comprise of children below the age of 5years, those above 5years and adults seeking health services at Hoima Regional Referral Hospital.

Sample size and sampling techniques;

The sample size is calculated using the Kish Leslie formula (1965) i.e

$n = z^2p(1-p)/e^2$

where,

n = Estimated minimum sample size required.

P =proportion of a characteristic in a sample (5.8%, [8]).

Z =1.96(for 95% confidence interval)

E = margin of error set at 5%

$$n = \frac{1.96^2 \times 0.058(1-0.058)}{0.05^2}$$

n = 84 patients.

Sampling technique

Both scientific and non-scientific sampling methods will be used.

The scientific sampling method is going to be a simple random sampling whereas the non-selective will be a purposive sampling technique.

The purposive sampling technique shall be used to establish the factors influencing the occurrence of Otitis Media among patients seeking care at HRRH. Only patients who are currently suffering the malady shall be engaged.

The simple random sampling method will be used to assess the prevalence through randomly selecting patients both at the ENT clinic and paediatric and neonatal unit.

Data collection methods and management

Both quantitative and qualitative approaches of data collection are going to be used i.e a mixed approach.

Tools;

A closed and structured questionnaire will be distributed

Unstructured interview with each subject in the study will also be done.

Focused group discussions especially with mothers of children aged below the age of 5years will also be conducted.

Data collection procedure

All mothers of children aged below the age of 5years with suspected Otitis Media will be approached especially in the pediatric and neonatal unit.

Those aged 5 and above, the adults both in the wards and the ear, nose and throat clinic shall also be approached.

Those who will meet the study criteria shall be informed about the purpose of the study, consent obtained and then they will be enrolled for the study.

Inclusion criteria

The inclusion criteria are – mothers of children aged below five (the children have either been suspected to have Otitis Media or the diagnosis is confirmed),those above 5 years and adults seeking care at the ENT clinic, have understood the purpose of the study and willing to consent.

Exclusion criteria

Those who will not be willing to consent.

Data processing and analysis

Data from this survey will be statistically analysed using the Statistical Package for Social Sciences (SPSS), (version 17.0).

Basic descriptive analysis shall be done using frequency distributions. Qualitative data will be sorted, categorized and conceptualized systematically to see the pattern of occurrence of Otitis Media. Measures of central tendency will be used to give exp

ected summary statistics of variables studied. Descriptive statistics will be used to describe a distribution of scores. Findings will be presented using frequency distribution tables, graphs and charts.

Inferential statistics and chi-square will be performed to compare the effects of different factors on the occurrence of Otitis Media. Since the study will be about a relationship (dependency between Otitis Media and other factors), chi square statistics (χ 2) will be used to establish whether a relationship exists among the variables.

Statistical significance will be assumed for P values< or = 0.05. associations between significant variables in the Chi square test will be further examined using adjusted odd ratios.

Qualitative data analysis

The qualitative data will be gathered to answer the research questions and find the themes emerging from the data as well as the meanings attached to those themes. The process [9] will be followed when undertaking this analysis but common sense and good judgment are important part of the process [10]. Logical thought processes will be used, while inductive and deductive reasoning will play a role in grasping and organizing the data and in generating possible alternate explanations [11]. Data analysis shall begin concurrently with the collection of the data [12,13]. The process will begin with data reduction which involves reading all the transcripts, research diary, memos and observations over many times, selecting, focusing on and transforming the data. All the data will be reviewed for content and coding to categorize the data; this will provide a baseline for further themes and arguments. Themes which emerge shall also be identified through continual engagement with the literature [10]. Data will then be organized into tables, charts and matrices to help with the interpretation and identification of emerging themes. Divergent views and ideas shall also be searched for. All these will be recorded in the reflexive and thoughts relating to emerging data recorded.

Ethical considerations

Permission shall be sought from the executive director of Hoima Regional Referral Hospital before undertaking this research. Ethical approval shall also be sought from various sources to ensure that the study adheres to acceptable ethical guidelines. In addition, I and the team shall explain the purpose of the study to each study participant after which an informed consent be obtained from the participants before participating in the study. In order to ensure confidentiality, names of the respondents will not be taken and information given during the interview will not be released to anyone. To further gain the trust and safeguard the privacy of respondents, the interviews will be done privately and secured areas [14].

RESULTS

Table1: Univariate analysis of the socio-demographic factors spurring the occurrence of otitis media among these participants

Variable	Category	Frequency (n = 85)	Percentage
Age(yrs)			
	0-5	34	40%
	6-18	30	35.3%
	18-59	14	16.5%
	60 and above	7	8.2%
Marital status			
	Married	8	9.5%

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Single	72	85.6%
Separated	3	3.5%
Divorced	2	1.5%
Level of education		
Nursery school	45	52.7%
Primary school	1	20.9%
Secondary school 8		
Post-secondary school	1	
6		
	6	
		19..4%
		6.0%
Occupation		
Employed	7	8.2%
Unemployed	76	91.8%

Majority of the participants-34/85(40%) th at participated/patients in this study fell within the age bracket of 0-5years and we re not married-72/85(85.6%) for obvious r easons. Also, majority 45/85(52.7%) of par ticipants were of nursery education level and most were un-employed 76/85(91.8%) . Details of these finding can be seen in th e table above.

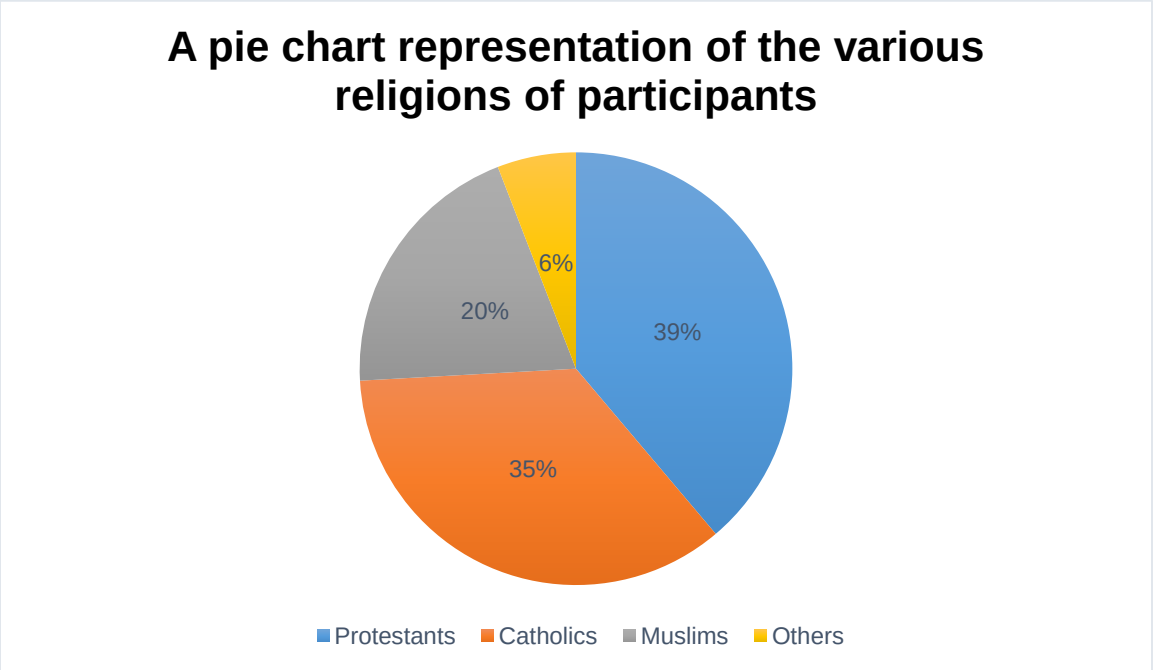

Figure 1: Religion and type of residence

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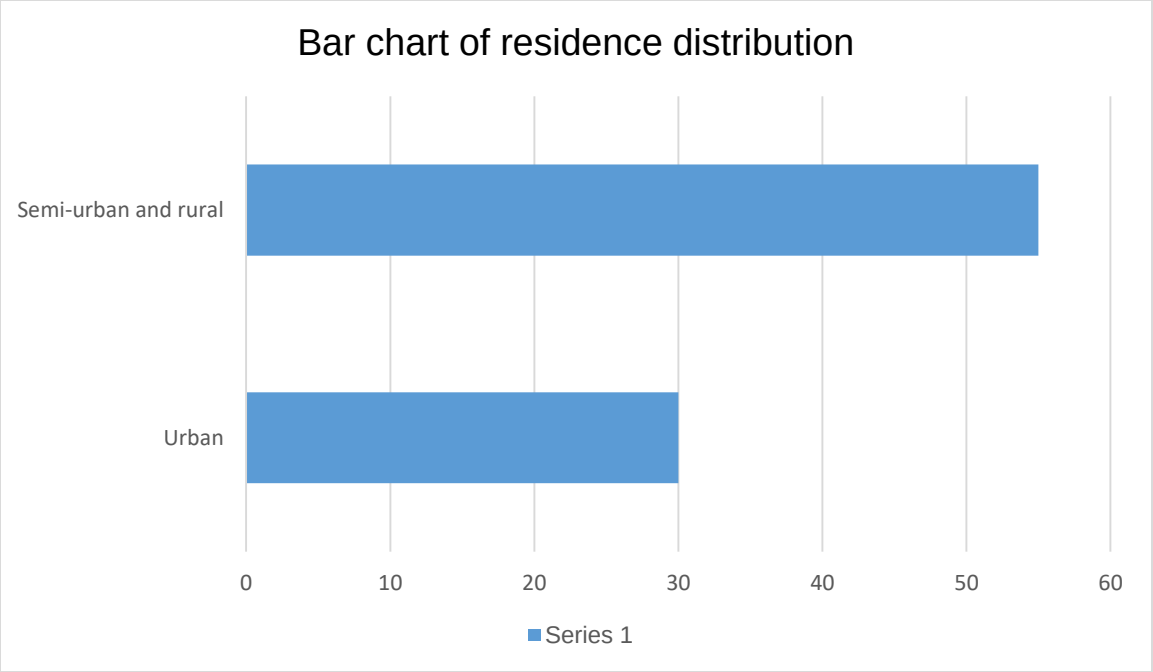

Figure 2: Showing majority of respondent

Fig2. Above shows that majority of respondents 33/85(41%) were Christians of the protestant denomination whilst fig.3 demonstrates that majority of respondents 55/85(64.7%) resided in semi-urban, slum and rural areas.

Table 2: Bivariate analysis of the socio-demographic factors influencing the occurrence of otitis media among the participants

		Otitis Media				
Variable	**Category**	**Yes n = 29**	**No n = 56**	**X^2**	**Df**	**P<0.05**
Age						
	0-5	15(35.1%)	25(64.9%			
	6-18	8(42.6%)	10(57.4%)	17.715	3	0.001
	18-59	0(0.0%)	14(100.0%)			
	≥60	0(0.0%)	1(100.0%)			
Marital status						
	Married	29(40.1%)	44(59.9%)			
	Single	0(0.0%)	8(100.0%)			
	Separated	0(0.0%)	3(100.0%)	8.627	4	0.071
	Divorced	0(0.0%)	1(100.0%)			
Level of education						
	No formal education	7(40.5%)	10(59.5%)			
	Primary school	14(32.1%)	30(67.9%)			
	Secondary school	8(46.2%)	8(53.8%)	14.431	3	0.002
Post-secondary education		0(0.0%)	6(100.0%)			
Occupation						
	Employed	3(34.6%)	7(65.4%)			

Self employed	4(22.7%)	14(77.3%)			
Peasant	22(43.1%)	28(56.9%)	3.253	1	0.071
House wife	0(0.0%)	6(100.0%)			
Religion					
Catholic	16(32.2%)	34(67.8%)			
Protestant	13(44.3%)	16(55.7%)			
Muslim	0(0.0%)	4(100.0%)			
Others	0(0.0%)	1(100.0%)	10.110	3	0.018
Area of residence					
Urban	12(50.0%)	5(50.0%)			
Rural	17(32.0%)	51(68.0%)	10.680	3	0.014

The socio-demographic factors which significantly influenced the occurrence of otitis media among the participants were age (p=0.001, X^2=17.715), the level of education (p=0.002,X^2=14.431), area of residence(p =0.014,X^2=10.680) and religion(p=0.018,X^2 =10.110).

Otitis media illness was of rare occurrence among those of advanced age, advanced education level and of relatively rare occurrence among those residing in urban areas.

Table 3: Multivariate analysis on the logistic regression results for the socio-demographic factors influencing the occurrence of otitis media among the aforementioned participants

		Sig	AOR	Lower	Upper
Variable	**Category**				
Marital status					
Married		0.091	4.315	0.056	1.780
Single		0.038	1.389	0.488	3.955
Separated		0.049	0.684	0.197	2.373
Divorced			1.000		
Level of education					
No formal education		0.397	1.542	0.566	1.201
Primary school		0.017	1.350	1.056	1.725
Secondary school		0.200	0.413	0.107	1.597
Post-secondary education			1.000		
Occupation					
Employed		0.056	0.208	0.042	1.040
Self employed		0.005	0.202	0.066	0.613
Peasant		0.114	1.583	0.299	1.138
House wife			1.000		
Religion					
Catholic		0.255	1.160	0.573	8.144
Protestant		0.592	1.174	0.653	2.109
Muslim		0.762	0.912	0.504	1.652
Others			1.000		

The results in the table above show that participants with no formal education were more likely (OR=1.542) to suffer Otitis media. Compared to participants with other occupational status, peasants were more likely (AOR=1.583) to suffer Otitis media.

The above results also demonstrate that participants who are married were four times (OR=4) were more likely to acquire otitis media.

Table 4: univariate analysis of other factors influencing the occurrence of otitis media among the participants in this study group

Factor	Category	Frequency(n=85)	Percentage
HIV/AIDs status			
	Positive	37	44.8
	Negative	48	55.2
Co-morbidities			
	Yes	57	67.6
	No	28	32.4
Malnutrition			
	Malnourished	18	21
	Well-nourished	67	79
Exposure to cigarette smoke			
	Yes	30	35
	No	55	65
Breastfeeding			
	Breast-fed	43	76.8
	Not- breastfed	13	23.2

Majority of participants reported to have been HIV-negative (48/85-55.2%), though a significant number also reported to have been positive for the disease (44.8%). 57/85(67.6%) of the participants were having co-morbities at the time of research whilst 28/85(32.4%) reported no co-morbidities at that moment. Majority of the group denied exposure to cigarette smoke either first or second hand representing 65%(55/85). A greater percentage were reportedly well-nourished and breast-fed i.e 67/85(79%) and 76.8% respectively though a significant number were malnourished -18/85(21%).

Table 5: Bivariate analysis of other factors influencing the occurrence of otitis media among participants in this study group

		Otitis media				
Variable	**Category**	**Yes n = 29**	**No n = 56**	**X^2**	**df**	**p value**
HIV/AIDs status						
	Positive	17(32.8%)	43(67.2%)			
	Negative	0(0.0%)	4(100.0%)	6.398	2	0.041
Co-morbidities						
	Yes	22(41.6%)	50(58.4%)			
	None	0(0.0%)	16(100.0%)	12.22	2	0.002
Malnutrition						
	Malnourished	12(32.2%)	32(67.8%)			
	Well-nourished	17(36.0%)	37(64.0%)	0.321	1	0.571
Exposure to cigarette smoke						
	Yes	17(22.7%)	48(77.3%)			
	No	18(50.0%)	8(50.0%)	8.418	1	0.004
Breast-feeding						
	Yes	29(35.6%)	65(64.4%)			
	No	0(0.0%)	4(100.0%)	3.791	1	0.052

There was a statistically significant relationship between the five other factors above and the occurrence of otitis media among the participants in this study. The HIV/AIDs status (p=0.041,X^2=6.398), co-morbidities(p=0.002,X^2=12.22), malnutrition/nutritional status (p=0.571,X^2=0.321), exposure to cigarette smoke (p=0.004,X^2=8.418), breastfeeding (p=0.052,X^2=3.791).

Table 6: Multivariate analysis of the logistic regression results for the relationship between other factors and the occurrence of Otitis media among participants in this study group

				Confidence interval	
Variable	**Category**	**Sig**	**AOR**	**Lower**	**Upper**
HIV/AIDs status					
	Positive	0.951	0.975	0.433	2.197
	Negative	0.005	2.350	0.170	0.723
Co-morbidities					
	Yes	0.094	0.250	0.049	1.267
	None	0.231	2.112	0.621	7.188
Exposure to cigarette smoke					
		0.816	1.151	0.351	3.772
No					
	Yes		1.000		
Nutritional status					
	Well-nourished	0.000	0.078	0.020	0.312
	Malnourished	0.068	0.433	0.176	1.064
Breast-feeding					
	Yes	0.045	3.366	0.137	0.977
	No	0.576	1.178	0.663	2.096

The results in the table above show that who were HIV/AIDs positive, had co-morbidities, were exposed to cigarette smoke, were malnourished and were not breast fed had a higher likelihood of developing Otitis Media.

DISCUSSION

In this study, it was found that the prevalence of Otitis Media was 8.0% in a general sense and not stratifying according to the socio-demographic, individual, physiological and other factors.

It was higher compared to the international statistic placed forth by [15] that ranged it between 0.4% and 4.2%. The results of this study on the prevalence of Otitis Media are consistent but higher than those reported by studies in Nigeria (7%), Rwanda (5.8%) and even research in Kenya that was at a record low (1.5%).

The differences cited above could be due to the methodologies applied, geographical locations, ethnic and cultural differences not forgetting economic divide.

The statistic provided by the world health organization demonstrates a larger proportion probably an average accounting for both developed nations with well-equiped health systems and developing nations, some with catch-up health systems while other surviving on dilapidated health facilities coupled with external grants and aid.

The socio-demographic factors which significantly influenced the occurrence of otitis media among patients seeking care at Hoima Regional Referral Hospital included but were not limited to age, marital status, level of education, religion, area of residence and occupation.

In the age domain, 40% of otitis media patients in this study group aged between 0 and 5 years. 85.6% were single marital status-wise and a significant proportion (52.7%, 20.9%) attended nursery and primary school respectively.

Though HIV/AIDs negative individuals contributed more to the ailing group; it shall not be shunned from the fact that HIV/AIDs positive participants significantly acco

unted for Otitis Media with a 44.8% contri bution. This is most obviously due to the state of reduced immunity.

Patient participants with co-morbidities ac counted for more (67.6%) compared to the ir co-morbidity negative counterparts.

Though majority of the participants were well-nourished, the malnourished folks co ntributed 21% compared to their well-nou rished counterparts.

In the cigarette smoke exposure castle; 35 % of sick participants reported exposure t o cigarette smoke whereas 65% reported n on-exposure to cigarette smoke.

On the other side of the breastfeeding circ le; 76.8% of sick participants were reporte dly breastfed whereas 23.2% were either n ot breastfed or had no idea.

Malnutrition, co-morbidities and lack of b reastfeeding are associated with reduced i mmunity and infection susceptibility and could be the route of acquisition.

Exposure to cigarette smoke predisposes t o recurrent upper respiratory tract infecti ons and thus the dire possibility of acute otitis media acquisition.

CONCLUSION

The findings of the study showed that a si gnificant number of participants (approxi mately 8 out of every100) had otitis medi a. This implied that the majority (92 of ev ery100 participants) were disease free.

However, the above-mentioned prevalence was by far comparatively higher than tha t of the World Health Organization figure.

This in part is a reflection of the influence of several factors such as; extremes of ag e, level of education, occupation, HIV/AID S status, presence of co-morbidities e.g. D iabetes Mellitus, exosure to cigarette smo ke, to mention but a few.

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