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Pattern, Distribution and Outcome of Otorhinolaryngological Conditions at Emergency Department, Muhimbili National Hospital

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Abstract: ***The research was conducted to determine pattern, distribution and outcome of patients with ORL conditions presenting at emergency medicine department in Muhimbili National Hospital. A cross-sectional hospital-based study was done, where patients attending MNH emergency department presenting with ORL conditions were included with sample size of 289 patients. Male to female ratio was 1.7:1 with most of the patients 133 (46%) belonging to age group 0-10 year. Among the ORL conditions, upper aerodigestive tract conditions were the most prevalent (52.9%) while head and neck conditions were the least encountered (4.8%). Nasal (62.5%) and upper aerodigestive tract (56.2%) anatomical sites were predominantly involved with ORL conditions in younger age groups below ten years while head and neck conditions (50%) dominated the elderly above 50yrs. Foreign bodies in the ear, nose and upper aerodigestive tract were successfully removed. It was concluded that, ORL conditions occurred in all age groups. However, majority of patients were children under ten years with mainly foreign bodies in ear, nose or upper aerodigestive tract. Most of the patients had a successful outcome after receiving emergency care. Malignancy conditions in upper aerodigestive tract reported more than one month and in advanced stage hence required emergency intervention.***

Keywords: Ear, Nose, Upper aerodigestive tract, foreign bodies, Emergency department

1. Introduction

Emergency department (ED) services are important and integral part of medical practice used as an indirect indicator of the quality of health care services provided. Unlike in developed countries where each department has its own emergency room, in developing countries there is a general emergency room. Most of the emergency services and stabilization of patients is done by the attending medical officer and emergency physician who triage patients and initiate management before a particular specialist is invited. Ear, nose and throat (ENT) emergency services access vary from country to country; either an open access or a referral based. **(1, 2)**

Muhimbili National Hospital (MNH) has a general emergency building where every specialty emergency including Otorhinolaryngology (ORL) is stabilized and resuscitated with the exception of maternity department which has its own sub specialized emergency services. However, a large proportion of ORL conditions do not need to be evaluated in the ED by an otolaryngologist–head and neck surgeon but may require outpatient follow-up. **(3)** Few consultations at emergency unit appeared to be real emergencies hence non urgent cases tend to overcrowd the emergency unit. Generally minimum number of ORL emergency was noted to be minority. **(4)** In Sub-Sahara Africa Nigeria reported 38.2% of patient who presented at ORL emergency room had real emergencies **(5).** In those cases, paediatrics were majority by one third (33%). **(2, 6, 7)** The concept of urgency may vary depending on social, familiarity, work- related, bureaucratic, sanitary, patient-related, and medical situations. **(8)**

Otorhinolaryngological conditions which are seen in daily practice include the following; Otological conditions; foreign body in the ear, mostly organic objects, living organism/insect, severe ear ache and discharge with or without facial weakness, perichondrial abscess and sudden hearing loss or sense of ear blockage especially on one ear. Rhinology conditions; Epistaxis, children presented with nasal blockage. Throat emergencies; Foreign body ingestion and aspiration, malignancy compressing airway and submandibular cellulitis (Ludwig's angina). **(8–10)**

Most emergency presentations of head and neck cancer were observed at advanced and late stages. However, emergency admissions to hospital for cancer patients may be an indication of diagnostic delay in primary care. **(11, 12)**

Ear, nose and throat conditions require specialized anatomical knowledge and skills with special instruments (otoscope, rhinoscope and laryngoscope) to be managed thus significant financial re-sources for admissions and in some cases surgical intervention is needed. Therefore, more involvement with ear, nose and throat conditions in training, or attendance during continued education is suggested. **(13)** The pattern, distribution and outcome of ORL conditions for patients attending Muhimbili National Hospital are not well understood. Thus, the study aimed at determining and establishing information projecting time lapsed from onset of ORL condition to arrival at MNH, types of ORL conditions, disposition and their outcome.

2. Materials and Methods

Study design, duration and area

Hospital based descriptive cross-sectional study was conducted for a period of 6 months from September 2019 to February 2020. MNH as a hospital located in Dar es Salaam, Tanzania was used as a study area. The department was used as a study point at MNH. All patients with ORL disorder who attended emergency department at MNH during the study period. All patients with signs and symptoms of ORL conditions who attended emergency were also in a study group. The study did not deal with patients attended emergency room with ear, nose, throat and or head and neck clinical presentation but refused to participate in the study. Patients with incomplete information were also excluded from the study. The sample size was calculated from Fischer's formula: The minimum estimated sample size (n) was thus taken to be 246 patients. Hospital based descriptive cross-sectional study was employed as a study design.

Study population Inclusion and Exclusion criteria

All patients with ORL disorder, signs and symptoms of ORL conditions who attended emergency department at MNH during the study period were included in the study. The number was estimated to be 246 from the sample size as calculated from Fischer's formula. All patients who attended emergency room with ear, nose, throat and /or head and neck clinical presentation but refused to participate in the study were excluded from the study. Also patients with incomplete information were excluded.

Data collection techniques

Pretested questionnaire was used to collect data from patients meeting inclusion criteria and consented. Emergency physician or resident or ORL resident or specialist filled the questionnaire after providing emergency care to the patient. Socio-demographic data (Age, sex) were asked from the patients or guardian/parents for the under 18 years and mental ill patients. Age group < 18 years are defined as children and > 18 years as adults. Clinical presentations, time lapsed from the onset of ORL emergency to arrival at MNH and disposition after receiving emergency services were filled by the attending doctor. These were grouped according to anatomical site as ear, nose, paranasal sinus, upper aerodigestive tract or head and neck.

Procedures done at the EMD were recorded accordingly by the principal investigator or attending doctor. Principal investigator determined the outcome of ORL condition post disposition at emergency department.

In order to minimize errors and incorrect data collection training on how to collect and fill the data was done to the emergency medicine and ORL residents and specialists by the principal investigator before commencing of the study.

Description of variables

Several variables were studied, independent variables studied were, age, sex and types of ORL conditions. The dependent variables studied were, dependent variables, time lapsed from the onset of ORL emergency to arrival at MNH, disposition of ORL conditions and outcome of ORL conditions.

Data analysis

Data were collected and immediately verified for completeness to ensure missing data are identified and corrected accordingly. Coding of the collected data was done and entered in the computer.

Frequency distribution tables to present demographic and other variables were used. Quantitative variables were analyzed using mean, median and percentages. Utilizing Chi Square (X2) in (statistical package for the social science) SPSS version 23 determines the association between the independent and dependent variables. A P-Value of less than 0.05 was considered statistically significant.

Ethical considerations and Approval

The proposal was presented in the Department of otorhinolaryngology of the Muhimbili University of Health and Allied Sciences. Ethical clearance was sought from the Research and Publication Committee of the School of Medicine and from the Senate Research and Publications Committee of the Muhimbili University of Health and Allied Sciences. Administrative permission to conduct the study was obtained from Muhimbili National Hospital as per the hospital management protocol**.** Informed consent was sought from all patients above 18 years or parents/guardians of patients less than 18 years with signs and symptoms of ORL conditions.

Study limitations and mitigation

The study setting involving only emergency department as other ORL conditions are attended at the ORL clinic and in the wards. In addition, data collected during the study period may be affected by seasonal disorders

3. Results and Discussion

A total of 289 patients with ORL conditions who met the criteria were included in the study. Out of 289 patients, 184 (63.7%) were male and the male to female ratio was 1.7:1. The age of participants ranged from 6 months to 91 years with a median age of 17 years. Most of the patients 133 (46%) belonged to age group 0-10 years. **(Table 1)**

Table 1: Age and sex characteristics of study participants (N=289)

Age group	Sex		
	Female	Male	Total n (%)
0-10	51	81	132 (46)
11-20	6	17	23 (7.8)
21-30	9	17	26 (8.8)
31-40	9	12	21 (7.6)
41-50	9	14	23 (7.8)
>50	21	43	64 (22)
Total	**105**	**184**	**289**

Anatomical site distribution among ORL conditions

Among the ORL conditions, upper aerodigestive tract conditions were the most prevalent (52.9%) while head and neck conditions were the least encountered (4.8%). Few patients had more than one anatomical site involved (3.1%). **(Table 2)**

Table 2: Anatomical site distribution

Anatomical site	Frequency	Percentage (%)
EAR	62	21.5
NASAL	32	11.1
PARANASAL SINUS	19	6.6
UPPER AERODIGESTIVE TRACT	153	52.9
HEAD AND NECK	14	4.8
MORE THAN ONE ANATOMICAL SITE		3.1
Upper aerodigestive tract and head and neck	3	
Ear and nasal	2	
Ear and Upper aerodigestive tract	2	
Ear and paranasal sinus	1	
Nasal and head and neck	1	
Total	289	100

Anatomical sites distribution in each age group

Nasal (62.5%) and upper aerodigestive tract (56.2%) anatomical sites were predominant involved with ORL conditions in younger age groups below ten years while head and neck conditions (50%) dominated the elderly above 50 years. This is statistically significant with P value of < 0.001. **(Figure 2)**

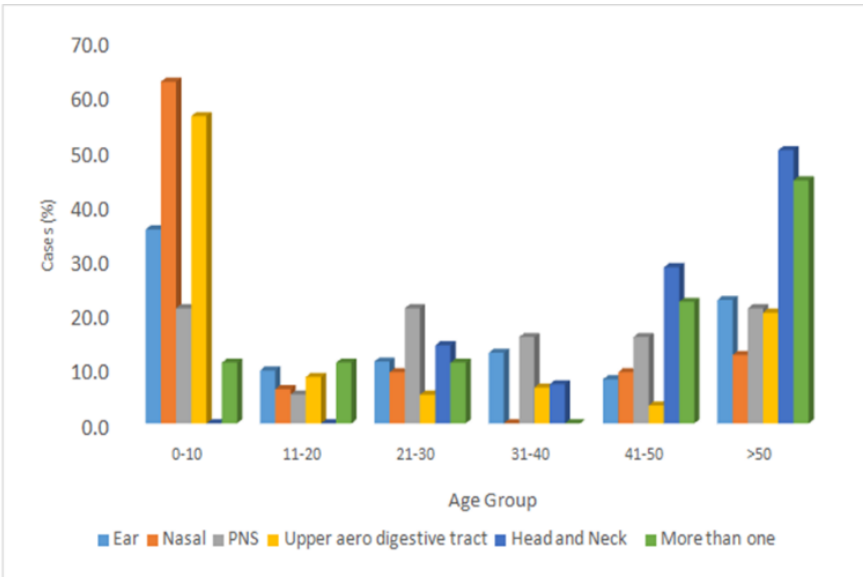

Figure 2: Anatomical sites distribution in each age group

Distribution of time elapsed from onset of ORL emergency to arrival per anatomical site

Out of all patients with ORL conditions 227 (78.5%) had ORL emergencies. Mainly upper aerodigestive tract conditions (56.8%) presented within one to seven days. Paranasal sinus (40%) conditions had presented to the hospital more than thirty days since onset of the ORL symptoms. This is statistically significant with a p- value of p=0.013. **(Table 3)**

Table 3: Distribution of time elapsed from onset of ORL emergency to arrival per anatomical site

Anatomical site	Time (days)				Total cases
	<1day	1-7	8-30	>30	
	n (%)	n (%)	n (%)	n (%)	
Ear	7 (23.3)	13 (43.3)	1 (3.3)	9 (30.0)	30
Nasal	7 (24.1)	15 (51.7)	4 (13.8)	3 (10.3)	29
Paranasal sinus	4 (40.0)	2 (20.0)	0 (0.0)	4 (40.0)	10
Upper aerodigestive tract	13 (8.8)	84 (56.8)	14 (9.5)	37 (25.0)	148
Head and neck	2 (50.0)	1 (25.0)	0 (0.0)	1 (25.0)	4
More than one anatomical site	3 (50.0)	2 (33.3)	0 (0.0)	1 (16.7)	6
	36 (15.9)	117 (51.5)	19 (8.4)	55 (24.2)	227

Frequency of ORL conditions in each anatomical site

The commonest ORL conditions were nasal foreign body (59.4%), sinonasal tumor (47.6%), foreign body esophagus (45.8%), tumor related hemorrhage (41.1%) in nasal, paranasal, upper aerodigestive tract and head and neck respectively.

Prevalence of foreign bodies in ENT orifes was 39.1%. **(Table 4)**

Table 4: Frequency of ORL conditions in each anatomical site

	ORL conditions	n(%)
Ear	Acute otitis media	4 (6.3)
	Chronic otitis media	15 (23.4)
	Middle ear effusion	3 (4.7)
	Otitis externa	10 (15.6)
	Foreign body	14 (21.8)
	Hearing Loss	3 (4.7)
	Peripheral vestibular disorder	5 (7.8)
	Others	10(15.7)
	Total	**64 (100)**
Nose	Epistaxis	11 (34.4)
	Foreign body	19(59.4)
	Others	2(6.2)
	Total	**32 (100)**
Paranasal sinuses	Acute Rhino sinusitis	1 (4.8)
	Complicated Rhino sinusitis	3 (14.3)
	Sino nasal tumor	10 (47.6)
	Trauma	7 (33.3)
	Total	**21 (100)**
Upper aerodigestive tract	Foreign body esophagus	70 (45.8)
	Foreign body airway	12 (7.8)
	Acute tonsillitis	21 (13.7)
	Vocal cord paralysis	3(2.0)
	Laryngomalacia	2 (1.3)
	Acute laryngitis	2 (1.3)
	UAO due to various causes	29(19%)
	Others	14 (9.1)
	Total	**153 (100)**
Head and Neck	Ludwig angina	2(11.8)
	Obstructive Dyspnea due to tumor	2(11.8)
	Tumor related hemorrhage	7(41.1)
	Cervical Lymphadenopathy	4(23.5)
	Others	2(11.8)
	Total	**17(100)**

Emergency care in ear conditions

Medication and aural toilet were the major initial care provided in chronic otitis media and otitis externa and foreign body removal procedure was done to all patients with foreign body the ear. **(Figure 3)**

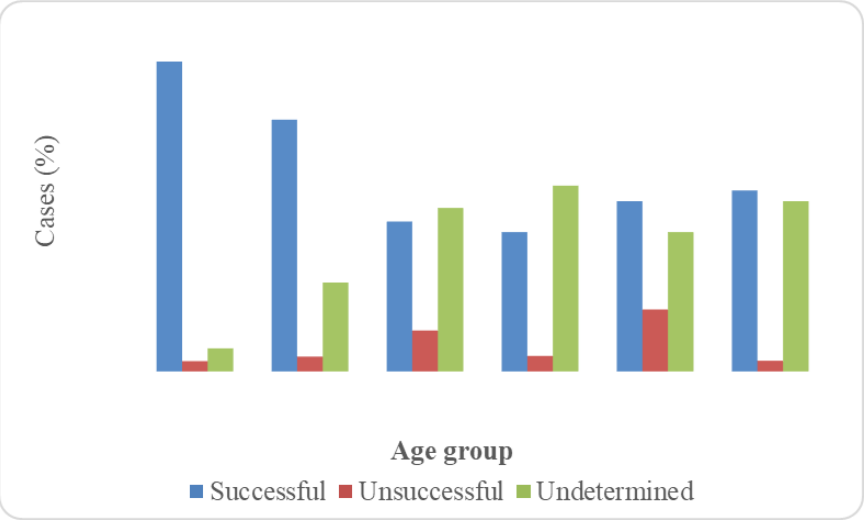

Figure 3: Emergency care in ear conditions

Emergency care in nasal conditions

Anterior and posterior nasal packing was the common nasal emergency care provided to patients with epistaxis, while foreign body removal was done to all patients with nasal foreign body. **(Figure 4)**

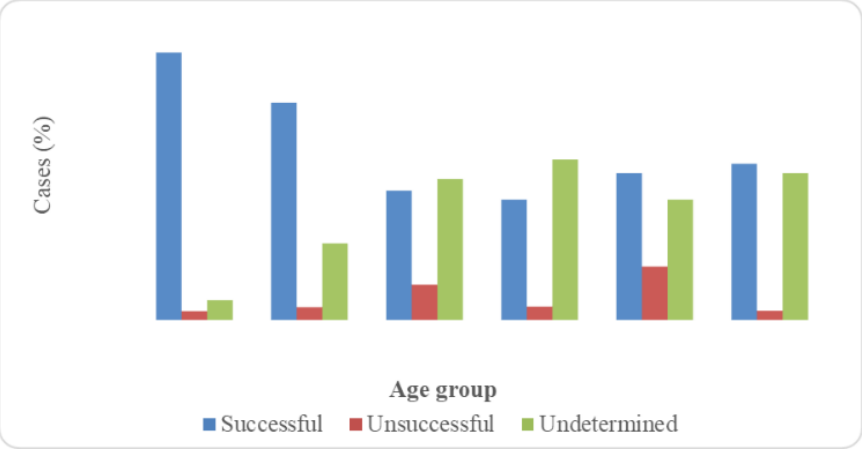

Figure 4: Emergency care in nasal conditions

Emergency care in paranasal conditions

Medication and wound dressing was the main initial care provided for paranasal sinus conditions. **(Figure 5)**

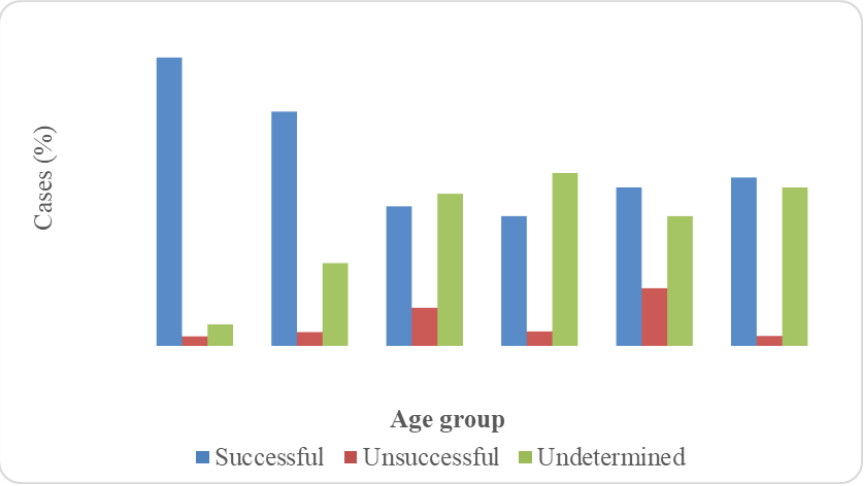

Figure 5: Emergency care in paranasal sinus conditions

Emergency care in upper aerodigestive tract

Oesophagoscopy and bronchoscopy were the main emergency procedure done for foreign bodies in the upper aerodigestive tract. All acute tonsillitis conditions were managed by medications. Other conditions: blocked infected tracheostomy, suction was done and cauterizations for bleeding post tonsillectomy were done. **(Figure 6)**

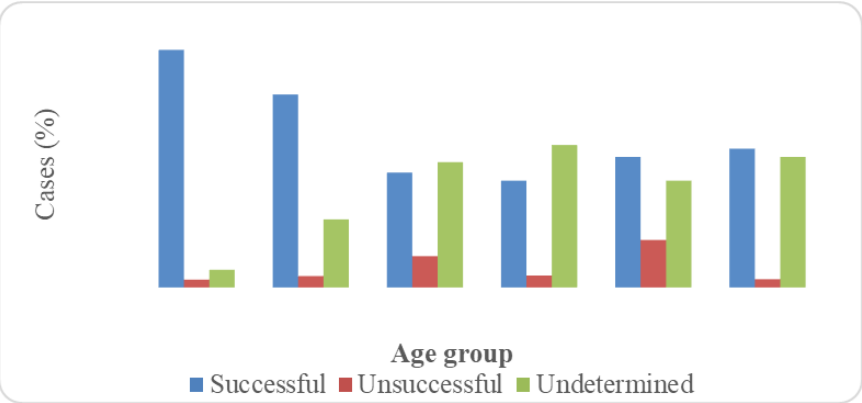

Figure 6: Emergency care in upper aerodigestive tract

Emergency care in head and neck conditions

Medication was the main initial care provided in head and neck conditions and tracheostomy was done to all conditions which compromised airway example obstructive dyspnoea due to tumor compression. **(Figure 7)**

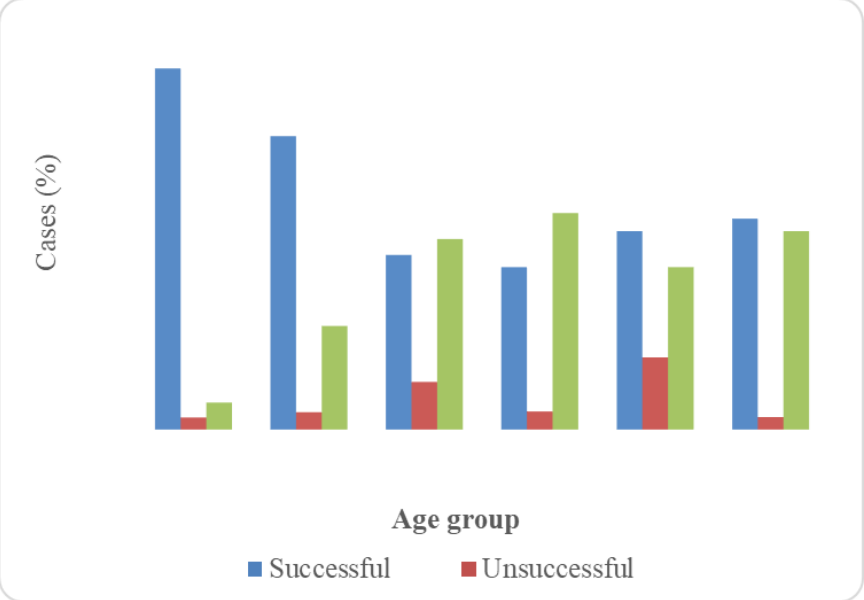

Figure 7: Emergency care in head and neck conditions

Disposition of ORL conditions per anatomical site

In ear conditions majority were under follow up (70%) while in paranasal sinus, upper aerodigestive tract and head and neck conditions more than 50% were admitted in the ward. However, head and neck condition also had more cases who died at emergency room and were disposed to mortuary (10%). **(Figure 8)**

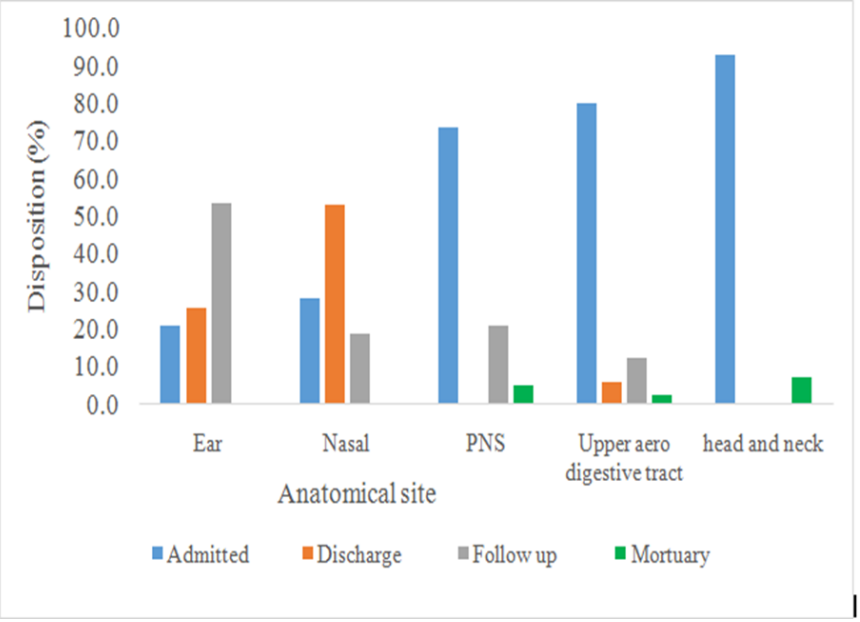

Figure 8: Disposition of ORL conditions per anatomical site

Outcome of ORL conditions per age groups

More than 50 percent of patients with age below twenty years had successfully outcome of the ORL conditions. Unlike patients with age group above twenty year whom majority (> 50%) outcome was undetermined. **(Figure 9)**

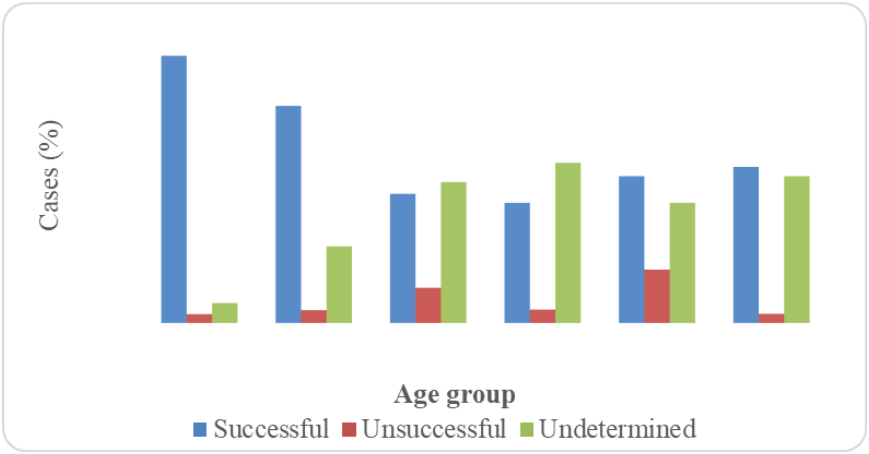

Figure 9: Outcome of ORL conditions per age group

Outcome of ORL conditions per anatomical site

More than half (76.5%) of upper aerodigestive tract conditions had a successful outcome while all paranasal sinus conditions had undetermined outcome. Patients with more than one anatomical sites were observed to have unsuccessful outcome (44.4%). **(Table 5)**

Table 5: Outcome of ORL conditions per anatomical site

Anatomical site	Outcome			Total
	Successful	Unsuccessful	Undetermined	
Ear	36 (58.1)	1 (1.6)	25 (40.3)	62
Nasal	29 (96.7)	1 (3.3)	0 (0.0)	30
PNS	0 (0.0)	0 (0.0)	21 (100.0)	21
Upper aero digestive tract	117 (76.5)	7 (4.6)	29 (19.0)	153
head and neck	9 (64.3)	2 (14.3)	3 (21.4)	14
more than one	12 (33..4)	4 (44.4)	2 (22.2)	9
Total	203	15	80	289

4. General Discussion

Emergency services form an integral part of the health care system. The emergency department is responsible for a large share of the care given in high complexity hospitals.

In this study there was male predominance with male to female ratio of 1.7:1 in keeping with a studies done in India in 2018 which had male to female 2:1 (1).Similar pattern was observed in a study done by Yojana et al 2012 with 2.5:1 (14).This finding is in contrary to a study done by Rivero et al in Spain and Luciano in Brazil who found male to female ratio 1:1.3 (35)(21).This discrepancy could be due to the fact that male are more exposed to risk occupations and behaviours.

Majority of the study participants were children age less than ten years (46%) majority were foreign bodies in ORL orifes (39.1%) likewise in a study done by UM Ibekwe where 41.7 % had foreign bodies (10)(5).In Nigeria also reported similar findings with foreign bodies prevalence almost similar (21%)(24).In contrary Luciano in Brazil observed the most affected age group was 20 to 40 years presenting mostly with upper respiratory tract infections(21). Similarly to a study done in United Kingdom, in this study head and neck conditions occurred more age group above 50 years. This happens to be the most affected age but also can be explained due to lack of equipments and ORL specialist in most of our hospitals and the need for multidisciplinary meeting for initiation management at the Ocean road cancer institute. Conversely in Trauma and emergency care centre in India had facial maxillary trauma (84%) as the commonest cause of ENT emergency admission followed by foreign body (5.8%) and throat infection (5.8%) (14).This difference may be because the latter study was done in a trauma centre.

In this study most of ORL conditions presented within one to seven days with majority being upper aerodigestive (56.8%) this is in keeping with studies done in Nigeria, one done to a paediatric population where throat emergency had a least time to present to the hospital since onset of the symptoms(15) and another conducted to all age group, which had majority of ORL conditions presented as acute i.e. less than 13 weeks (92.5%) among them mainly was within one week (57%) (36).In Brazil a also a study done in paediatric population revealed upper airway infection presented to the emergency room within 48 hours (19).This similarity can be explained due to the fact that in our study also the most common affected group was children.

However another study in Nigeria done through accident and emergency unit to evaluate pattern of ear nose and throat injuries showed majority reported in less than six hours (20). This can be because of involvement of accident unit in the study where patients tend to presents direct and earlier after injury/accident. In addition in this study upper aerodigestive tract and head and neck conditions presented in less than seven days due to upper airway obstruction and necessitating emergency tracheostomy. Paranasal sinus conditions presented to the hospital less than twenty four hours(40%) and others came more than one month (40%) in contrast to a study done in Northern Nigeria where the least otological conditions like Ramsay hunt syndrome complicated with facial nerve palsy and cerebral spinal fluid otorrhea presented within five hours (25).

Upper aerodigestive tract conditions (52.9%) were the most common disorder and least are the head and neck conditions encountered likewise a study done in Kolkata India where throat conditions were main ones reported (41.8%) and foreign body being the major condition (75.3%) (22).Consistently in Brazil and Greece majority presented at emergency room with upper aerodigestive tract conditions particularly upper respiratory tract infections (24.55%) but with minority being foreign bodies (0.56% and acute tonsillitis (12.5%) respectively (21)(13).In Brazil the discrepancy can be explained due to the fact that the study population constituted mainly adult. Unfortunately this was different in Brazil and Nigeria were ORL conditions trend was mainly otological (65.41%) and (49.9%) followed by nose 17.99% and 31.9%and throat 14.79% and 15.9% respectively (16)(36).In this study Head and neck conditions were the least 3.1% corresponding to a studies done in Brazil which had similar findings 2.07% and 1.79% (8)(16).This study showed nasal conditions as the second most prevalent conditions led by nasal foreign bodies (59.4%) followed by epistaxis (34.4%) however studies done in India and Israel geriatric population had the high proportion of epistaxis (25.58%) and 20.1% (1)(23) respectively. Upper airway obstruction due to upper aerodigestive malignancy was evidently (19%) thus in late stage necessitating surgical interventions.This is similar to study by Bannister where malignant conditions oropharyngeal laryngeal and hypopharynx cancer presented late in advanced stage (12).Life threatened condition like foreign body airway were immediately transferred to emergency theatre for Bronchoscopy (7.8%) this is similar to study done in France where life threatened conditions(0.5%) had to be transferred to operation room.(6)

Ear conditions were mainly under follow up (70%) while in paranasal (70%) and upper aerodigestive tracts 80 % and head and neck (90%) conditions were admitted this is the same as in a study done by Sharma et al in India where majority (>50%) of ORL conditions were discharged as well as among admitted the leading cause of admission was a foreign body in upper aerodigestive tract admitted for surgical intervention like tracheostomy, foreign body removal bronchoscopy incision and drainage (10).

In this study upper aerodigestive tract conditions mainly underwent oesophagoscopy (45.8%) similarly to Sudan and Nigeria where 59.7 % and 63.9% had surgical procedures (26)(30).

Nasal conditions, epistaxis (34 %)was successfully (93.3%) mainly controlled by nasal packing and no cauterisation was done at emergency room however a

study done in India some of the patients with intractable epistaxis were transferred to theatre for endoscopic cauterization of bleeders (31).

Initial care provided for retropharyngeal abscess, Ludwig angina and neck abscess consistently like others were managed by incision and drainage(5) (14).

More than 50 % of ORL conditions had successful outcome this tally with other studies done in Nigeria where 86.6% and 77.4% had satisfactory outcome respectively (5)(36).

All patients who underwent oesophagoscopy had no complications like a study done in India where no complication was notes but had 2 cases of tracheal stenosis in cut neck injury and persistent foreign body sensation in old retained foreign bodies cases (10)(22). This difference can be due to short time of follow up for complications to be evident in this study.

Paranasal conditions had higher unsuccessful cases (59.1%) majority were majority were age group 21-30 years (48%) followed by age above 50 years (40.9%). This also was observed in London where outcome of ORL condition was associates with fixed risk factors like age and co morbidities (32). This is because age group above 40 years has more likely to have co morbidities. Middle age group have being affected due to facial trauma as it is a more active group.

5. Conclusion and Recommendation

Conclusion

ORL conditions attended at MNH emergency department occurred in all age groups. Majority of patients were children under ten years (46%) with mainly foreign bodies in ear, nose or upper aerodigestive tract (39.1%). Most of the patients had a successful outcome after receiving emergency care. Outcome of ORL condition in middle age group and age above forty years was unsuccessfully compare to all other age groups. Patients with ORL conditions who presented to the hospital later than thirty days had majority malignancy conditions in advanced stage mainly with upper air way obstruction hence required emergency surgical interventions.

Recommendation

To ensure effective management of ORL conditions, health education to community and health workers on the importance of early diagnosis and treatment. Otorhinolaryngology patients presenting with clinical features of upper aero- digestive tract conditions should be fully examined and investigated to assess for any disorder in these areas. The need for further studies with large sample size and longer study time is important to ensure the the trend is established for effective management of ORL conditions.

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