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Original Research Article

Comprehensive analysis of patterns, comorbidities and outcomes of patients admitted to ENT under tertiary hospital in Botswana

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ABSTRACT

Background: Ear, nose and throat (ENT) conditions are a significant yet underrecognized contributor to the global disease burden, particularly in developing countries. In Botswana, there is limited local data on the clinical profiles, comorbidities, and outcomes of ENT patients. This study aimed to evaluate the patterns of disease, associated comorbidities, and treatment outcomes of patients admitted to the ENT department at a major tertiary referral center in Botswana.
Methods: This retrospective, cross-sectional, descriptive study was conducted via systematic chart review of 108 patient records for admissions occurring between January 2020 and December 2023. Data were extracted using a standardized tool and analyzed to assess demographic trends, clinical diagnoses, comorbidities, treatment modalities, and patient outcomes.
Results: The findings from our study indicate that rhinology (29%) and otology (27.8%) cases accounted for the highest proportion of admissions to ENT ward. Nearly half (49.3%) of the patients had comorbidities, with human immunodeficiency virus (21.3%) being the most prevalent. Surgical management was the primary mode of treatment in 56% of cases with total in patient Mortality rate of 0.9%.
Conclusions: The findings underscore the substantial burden of preventable and treatable ENT conditions requiring tertiary-level care, often complicated by comorbidities like HIV. The findings provide clinicians with a clearer understanding of the pattern of ENT conditions. We recommend further comprehensive studies that include data from hospitals across Botswana, inpatient populations, and patient outcomes to better characterize the national burden and trends of ENT conditions.

Keywords: HIV, Otolaryngology disease, Otolaryngology ward, Pattern of ENT disease

INTRODUCTION

Ear, nose and throat (ENT) conditions contribute significantly to the global burden of disease but often remain underappreciated in public health planning. ENT conditions have been shown to account for up to a quarter of primary care consultations.[1,2] ENT diseases can have serious implications for communication, nutrition, education, and quality of life. In low- and middle-income countries, where healthcare systems are often overstretched, their impact is even more profound.[3] Research indicates that ENT disorders are extremely

common in both children and adults across sub-Saharan Africa and Asia. While data is scarcer for sub-Saharan Africa, existing studies from countries like Ethiopia, Zambia, Tanzania and Nigeria reveal consistent trends. These include widespread ear diseases, upper airway blockages, and a high number of patients seeking help only after their conditions have become severe, frequently necessitating surgical intervention.[4-6]

The burden of ENT conditions has been found to be particularly high among children. Hospital-based studies consistently show otitis media, adeno-tonsillar hypertrophy, and foreign body insertions as common causes of admission and surgical intervention.[7] If left untreated, these conditions can lead to irreversible complications such as hearing loss, delayed speech, and impaired cognitive development. In many cases, caregivers face long travel distances and extended wait times for surgical care, which further compounds the emotional and financial stress on families.[1-4]

Complicating the picture further are the socioeconomic and health system challenges that shape access to ENT care.[5] Infrastructure limitations, shortages of trained ENT professionals, and underfunded services are well-documented in regional studies. For example, a ten-year review of ENT services in Southern Africa revealed persistent gaps in both human resources and equipment, with limited progress in rural service delivery and audiologic care.

These challenges include critical shortages of workforce, equipment, and medication, which impede patient access to effective ENT healthcare.[1-5] Even where services exist, general physicians often report limited confidence in managing ENT cases due to insufficient training during medical school.[2-8] This leads to misdiagnoses, under-referral, and delays in definitive treatment.

While ENT research is emerging in sub-Saharan African countries; There appears to be limited published data currently detailing the clinical profiles, comorbidities, or outcomes of ENT inpatients at tertiary-level care in Botswana. This represents a critical gap, especially considering the country's unique epidemiologic context, including the burden of communicable diseases such as HIV and tuberculosis, which may influence ENT presentations.[5,8,9] Without such data, it becomes challenging to advocate for targeted interventions, resource allocation, or improvements in training and service delivery.

This study therefore seeks to provide a comprehensive analysis of the patterns, comorbidities, and outcomes of patients admitted under ENT care at Princess Marina Hospital, the main referral tertiary hospital in Botswana. It aims to fill the existing gap by examining the demographic characteristics, disease prevalence, associated comorbidities, and the surgical and clinical outcomes of patients admitted to the ENT department.

METHODS

Botswana is upper middle-income country in SSA, with a estimated population of 2.6 million people (2023 estimate) is often regarded as one of Africa's most stable and prosperous democracies in Africa. Children under 18 years old account for 38% of this population. Crude Birth Rate is 21 births per 1,000 population (2023 est.). Botswana is divided into Ten administrative districts. Gaborone is the capital of the nation. Princess Marina Hospital (PMH) is a referral tertiary care facility that plays a crucial role in managing complex ENT cases in Botswana. This was a quantitative, retrospective, cross-sectional study that evaluated the patterns, comorbidities, and outcomes of patients admitted to the ENT department of Princess Marina Tertiary Teaching Hospital between January 2023 and December 2023. During the study period, all patients admitted from the outpatient clinic and emergency room to ward were evaluated. Patient data were accessed through a medical chart review, and patients who were re-admitted with the same condition and charts with incomplete data were excluded from the study. A structured data extraction form was used to carefully record all relevant details for analysis, including patient age, gender, diagnosis, comorbidities, admission duration, and outcomes. Statistical analysis was performed using SPSS version 29. Frequencies and percentages were used to evaluate variables such as diagnosis, comorbidities, outcomes, gender, and age.

RESULTS

Biographical information

Demographic detail: A total of 108 patients were admitted during the study period with age range from 2years to 89 years.

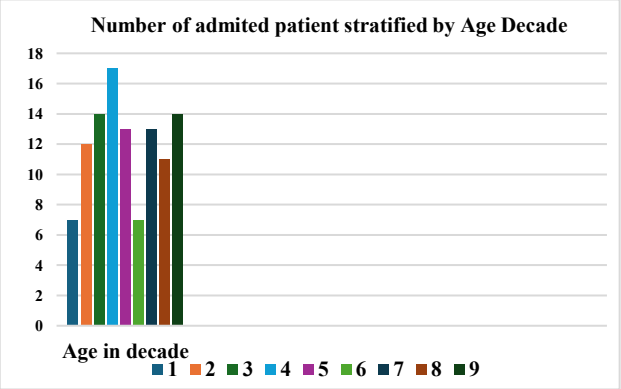

Figure 1: Age decade and frequency of hospital admissions with high predominance being in the 4-decade followed by the 3rd and 9th decades.

The majority of patients 58 (51.9%) were male and Female patient account 56 (48.1%). The fourth decade is the most common age group for our patient accounting 15.7% patient admitted in the study period.

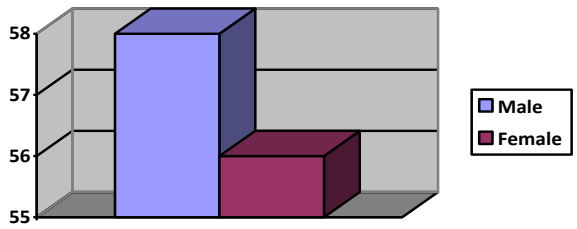

Figure 2: Sex-based distribution of inpatient ENT admissions.

Table 1: Area of presenting compliant.

Presenting area	Frequency	Percent (%)
Ear	30	27.8
Esophagus	2	1.9
Larynx	7	6.5
Neck	6	5.6
Nose	32	29.9
Parotid	1	.9
Throat	28	25.9
Trachea	2	1.9
Total	108	100

Presenting signs and symptoms before admission: The mean duration of symptoms prior to admission was 45.68 days (SD=147). The most frequent admission diagnoses were sinonasal (28.6%) and otologic (27.8%) disorders, followed by throat disorders (26.0%). Laryngeal disorders and head and neck masses were less common, each representing 6.5% of cases.

Diagnosis and comorbidity: The most frequent primary diagnosis was peritonsillar abscess (9.3%), followed by recurrent tonsillitis (8.3%). Chronic rhinosinusitis and chronic suppurative otitis media were jointly the next most common (6.5% each), followed by epistaxis and malignant otitis externa (5.6% each), and finally laryngeal cancer (4.6%). Nearly half of the patients (49.3%) had at least one known comorbidity upon admission. The most prevalent comorbidity was HIV infection (21.3%), with hypertension (13.0%), diabetes (9.3%), and allergy (3.7%) also reported.

Treatment and outcome: Surgical management was the most common approach for this patient group, employed in 56% of cases. Within this group, abscess drainage accompanied by antibiotic treatment was the most frequent procedure (10.2%), followed by tonsillectomy (9.2%).

Outcome at discharge and complications: The majority of patients (88.9%) were discharged with an improved outcome. A further 10% were referred for specialized care, primarily to oncology and palliative care services. The overall mortality rate during the study period was 0.9%.

Table 2: The common primary ENT conditions in PMH.

Primary diagnosis	Freq	Percentage (%)
Peritonsillar abscess	10	9.3
Recurrent tonsillitis	9	8.3
Chronic suppurative otitis media	7	6.5
Chronic rhinosinusitis with/without nasal polyposis	7	6.5
Malignant otitis externa	6	5.6
Sever epistaxis	6	5.6
Laryngeal cancer	5	4.6
Otogenic brain abscess	4	3.7
Allergic fungal rhino sinusitis	4	3.7
Oropharyngeal cancer	3	2.8
Others	47	43.4
Total	108	100

Table 3: The most common treatment plans carried out for patients.

Surgical procedure	Freq	Percentage (%)
Deep neck abscess drainage	11	18
Tonsillectomy	10	16.4
Head and neck mass excision	6	9.8
Fess	5	8.2
Total laryngectomy	2	3.3
Septorhinoplasty	2	3.3
Others	25	41
Total	61	100

DISCUSSION

Demographic

This study's demographic findings are consistent with reported international trends. We observed a nearly equal gender distribution, with a slight predominance of male patients (51.9% compared to 48.1% female). This trend of a male majority, albeit a smaller one, is supported by previous studies in Toronto (64%) and India (65%).[10,11] This was however incongruent with the results from a study conducted in ENT department in Pakistan which had showed that women made up a tiny majority of about 53%.[12]

Disparities in gender-based health-seeking behaviour and differences between inpatient and outpatient study cohorts are potential explanations for this demographic variation. Regarding age, the study population (range: 2–89 years; mean: 45 years) was predominantly composed of individuals aged 40–49 years. This finding diverges from the demographic profiles described in other studies,

which have reported either a predominantly paediatrics population (e.g., Australia) or a concentration of young adults (20–39 years) seeking ENT treatment predominately in sub-Saharan africa.[13] The predominance of older adults in this cohort may be attributed to factors such as late clinical presentation, poor health seeking behaviour and the natural progression of chronic diseases. The observed near-balanced gender ratio suggests equitable access to care, at least within the inpatient setting.

Comorbidities

Comorbidities were present in majority of our patients accounting for 59.3% of admitted patient with HIV infection (21.3%) being the lead comorbidity. This finding is in keeping with the high prevalence of HIV in the context of Botswana where it is a major public health challenge with prevalence rate of 20.8%.[9] HIV was the most common cause of immunodeficiency in this cohort. An immunocompromised state, as established in the literature, is a known risk factor for the development and progression of severe otologic conditions such as chronic suppurative otitis media (CSOM) and malignant otitis externa.[5] Other prevalent comorbidities included hypertension (13.0%), diabetes mellitus (9.3%), asthma (6.5%), and eczema (3.7%). Consistent with prior studies, hypertension and diabetes are of particular clinical significance in ENT care due to their association with impaired healing and a higher risk of postoperative infection.[6] Although the prevalence of allergy in this cohort (6.5%) was substantially lower than the 19% reported in other study(eg.Tanzanian) studies, the impact of comorbid asthma on exacerbating conditions such as chronic rhinosinusitis remains a relevant clinical finding.[6]

Diagnosis

The most common diagnostic categories in this cohort were nasal (29.0%), otologic (27.8%), and throat (25.0%) disorders. The most frequent primary diagnoses within these categories were peritonsillar abscess (9.3%), recurrent tonsillitis (8.3%), chronic suppurative otitis media (CSOM) (6.5%), chronic rhinosinusitis with nasal polyposis (6.5%), Sever epistaxis (5.6%), and malignant otitis externa (5.6%). This distribution of conditions is consistent with patterns reported in other studies from Sub-Saharan Africa, including those from Ethiopia and Nigeria.[4-10] For instance, a study from a Nigerian tertiary hospital similarly identified ear, nasal, and pharyngeal disorders as the most frequent ENT presentations (Eziyi, Amusa, and Akinpelu, 2010).[14] This consistency suggests that upper respiratory and auditory conditions constitute the dominant ENT caseload across the region, likely influenced by shared environmental exposures, socioeconomic determinants, constraints in healthcare access and deficiency in trained professionals at primary and secondary health facilities.[10-13] The high prevalence of sinonasal complaints is consistent with global patterns of conditions like allergic rhinitis, chronic rhinosinusitis, and nasal polyps. These are often exacerbated by regional factors such as environmental allergens, dust exposure, and climate variability.

As previously discussed, the high prevalence of HIV and associated immunodeficiency in Botswana adds a layer of complexity to its disease profile compared to other African nations. This is evident in the high frequency of neoplastic diagnoses, which is likely attributable to the oncogenic effects of HIV. Among admitted patients with neoplasia, the distribution was as follows: benign neoplasms (12.0%), malignant neoplasms (9.3%), and tumors with superimposed infection (6.5%).

Treatment

Treatment data from this study indicate that a majority (56%) of admitted ENT patients underwent surgical management. The most common procedures were abscess drainage accompanied by antibiotic therapy (10.2%) and tonsillectomy for recurrent or acute tonsillitis (9.3%). This trend highlights a clinical pattern in which acute infectious conditions particularly those involving the throat and deep neck spaces frequently require operative intervention. The prevalence of these procedures suggests that patients often present with advanced infections necessitating immediate surgical management, such as peritonsillar or deep neck space abscesses.

In contrast, non-surgical management with intravenous (IV) antimicrobial therapy with office procedure was utilised in 44% of cases. This approach was likely reserved for severe but less surgically amenable infections, such as complicated rhinosinusitis, severe otitis media, or deep neck space infections without frank abscess formation. These cases underscore the critical importance of timely medical intervention and suggest that a significant proportion of ENT conditions can be effectively managed conservatively if diagnosed and treated early. The observed treatment pattern reflects a dual burden in ENT care within this setting: a substantial proportion of cases present as acute surgical emergencies, while a significant number are manageable with medical therapy alone.

This finding is consistent with reports from other African contexts. For example, Fasunla and Nwaorgu (2013), in a 10-year review of ENT admissions at a Nigerian tertiary hospital, also documented a predominance of surgical management, notably for tonsillar pathologies and deep neck space infections. In their study, conservative approaches were similarly utilized for conditions like otitis media and sinusitis, with generally favourable outcomes. Their emphasis on the critical role of timely surgical intervention in achieving positive recovery outcomes further supports the clinical pattern identified in the present study.[8]

Outcomes and their implications

A significant majority of ENT patients admitted to Princess Marina Hospital (PMH) experienced positive outcomes. Specifically, 88.9% were discharged following clinical improvement, while 10.0% were referred for specialized care. The recorded mortality rate was low (0.9%). These outcomes indicate that most ENT conditions managed at PMH are treatable with available resources, particularly when patients present early and receive timely surgical intervention. This finding aligns with literature from south east asia, which also suggests that improved patient outcomes are achievable in resource-limited settings through targeted clinical management strategies and a competent multidisciplinary ENT team.[6-10]

The low observed mortality rate (0.9%) is a promising finding; however, it must be interpreted with caution. Underreporting is plausible, the early referral of critically ill patients to other department could result in an underestimation of the true mortality within this cohort. As noted in the literature, delayed health-seeking behaviour and initial reliance on non-medical interventions, such as traditional healers, often result in patients presenting at advanced disease stages. Consequently, the reported mortality rate may not fully reflect the severity of conditions managed at this institution, making early detection efforts and primary care integration critical for sustaining positive outcomes.[13]

The reliance on surgical management in 56% of patients indicates that operative intervention remains a cornerstone of inpatient ENT care, with procedures such as abscess drainage and tonsillectomy being most prevalent. This finding underscores the critical importance of maintaining robust surgical capacity, including functional equipment, trained personnel, and effective perioperative care systems. Conversely, the successful non-surgical management of 44% of cases demonstrates that not all ENT conditions require operative intervention and that favourable outcomes can be achieved with appropriate medical protocols. This dual approach is supported by the literature, which suggests that enhanced clinical training for health care provider in managing common ENT conditions could reduce the surgical burden on tertiary centres while maintaining high standards of patient care.[1,2,8] Patient outcomes are determined by a complex interplay between comorbidities, timing of presentation, and healthcare system readiness. In this study, 49.3% of patients had at least one comorbidity, including HIV (21.3%), hypertension (13.0%), and diabetes mellitus (9.3%). All of these conditions are known to complicate ENT management, underscoring the necessity of integrated chronic disease management.[5,10,15]

CONCLUSION

Patient profiles in ENT-HNS wards vary widely by geography, demographics, and time trends. Our study at PMH found that rhinology and otology cases made up most ENT admissions, with incision and drainage being the most common surgery, followed by tonsillectomy. The data revealed deep neck abscess, recurrent tonsillitis, chronic rhinosinusitis and chronic suppurative otitis media as primary reasons for admission across ages. HIV and hypertension were common comorbidities, significantly influencing treatment and outcomes. The results demonstrate that timely surgical intervention and medical therapy are associated with positive outcomes. However, care delivery is challenged by delayed patient presentations, high comorbidity rates, and resource constraints. Many cases could have been managed at primary or secondary care levels, highlighting the need to strengthen these services to reduce the burden on tertiary centres. Ultimately, this epidemiological profile underscores the necessity for strategic resource allocation, targeted preventive measures, and investments across all healthcare levels to optimize ENT service delivery, alleviate pressure on tertiary centres, and improve patient outcomes.

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Conflict of interest: None declared
Ethical approval: The study was approved by the university of Botswana, health ministry of Botswana and Princess Marina tertiary Hospital

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