

Ear Infections and their Complications in Eastern of the Democratic Republic of the Congo

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Abstract

Background: The lack of otolaryngology services in our area may be a key cause of a high ear, nose and throat (ENT) disease complication rate. Poor management of ear infections can lead to many complications. The aim of this survey was to determine the epidemiological characteristic of ear infections and their complications in patients presenting to health facilities in Butembo city.

Methods: A retrospective cross-sectional chart review survey carried out from January 2017 to December 2017.

Results: Overall 2865 patients consulted for an ENT problem, 714 presented with ear infections (24.9% of all ENT patients seen) and had completed data. There were 438 men and 276 women with an average age of 26 years old. The most affected age group was children aged between 0 and 10 years with 30.01% prevalence. The prevalence was highest in rural (29.8%). Otitis media predominated (85.6% of all ear infections). Otitis externa and interna were represented with a frequency of 13.35% and 1.05% respectively. The most common complication was chronic otitis (41.7%).

Conclusion: Ear infections remain a serious public health problem because of their incidence and complications associated to a high morbidity. Early and detailed consultation by an otolaryngologist might be a solution to this high rate of their complications in our area.

Key words: Ear infections; Complications; Butembo; DRC

Introduction

In developing countries, ear infections are common health problems for children and adults. Both ear inflammation and ear discharge are the commonest symptoms of ear infection [1]. The ear is an important organ that allows us to hear and to be in touch with others, and also help in the function of balance for the body. Infections of the ear disturb the homeostasis of the human body [2]. Otitis is skin or mucous membrane inflammation of the ear. According to which part is affected by the inflammation, the otitis can be named as external, middle and inner otitis [3]. Otitis externa is an inflammation of the external auditory canal, and may be caused by bacterial infections in 90% of cases or fungus in 10% [4]. Otitis media is an inflammation of the middle ear and mastoid air cells which could be clinically classified as an acute otitis media (AOM), an otitis media with effusion (OME) and chronic suppurative otitis media (CSOM) [5].

An otitis interna is technically an infection of the innermost part of the ear. Often, an otitis interna is not an infection, but an inflammation or irritation of the parts of the ear responsible for balance and hearing. Less commonly, an otitis interna is a true infection caused by a virus or bacteria [6].

Otitis is an otolaryngological emergency associated with significant morbidity (e.g. deafness and facial paralysis) but also mortality due to intracranial complications (e.g. meningitis, encephalitis). Numerous works have shown the importance of the bacterial epidemiology of the otitis and the virulence of some pathogens [7-10].

Every year, it is estimated that there are more than 70 million cases of otitis worldwide. In 2017 the World Health Organisation (WHO) declared that 330 million people endure problems of chronic otitis [11,12]. Every year 21 000 people worldwide, die

from the complications of otitis media or its resulting illnesses and that 31 in 10 000 develop an auditory deficiency following otitis media infection [13].

Fifty percent of the 70 million yearly cases of acute otitis media present in developing countries [2]. In sub-Saharan Africa, acute otitis media is characterized by its high rate of the complications. The delayed diagnosis in this part of the world, explains the high prevalence of adults patients with chronic ear infections as well as a high rate of complications [14]. In Guinea Conakry, among 1877 patients seen by ENT, 13.96% of them were diagnosed with otitis [4].

In a survey conducted in five countries of sub-Saharan Africa (Kenya, Gabon, Cameroon, Congo and Democratic Republic of the Congo), 18.9% (100/528) patients had acute otitis media [14].

As ear infections remain a great public health problem worldwide due to their impact and complications which are associated to a high rate of morbidity, the aim of this survey was to determine the epidemiology and complications of ear infections in Eastern of the Democratic Republic of the Congo. Furthermore the survey could enable health workers to be more aware of ear infections and facilitate the timely care of patients suffering from ear infections; this could reduce the rate of their complications in Eastern of the Democratic Republic of the Congo.

Methods

A retrospective cross-sectional chart review survey carried out from the 1st January 2017 to 31st December 2017 in Health facilities located in two Health zones in Butembo Health District, Eastern part of the Democratic Republic of the Congo.

The target population consisted of 2865 patients admitted and diagnosed with ENT pathology in all health centers in our survey site. Our sample was exhaustive and constituted of 714 patients diagnosed with ear infections and whose health files were found and were completely filled.

The following parameters were screened: Socio-demographics (age, sex, and origin), types of otitis (otitis externa, otitis media, otitis interna) and complications of otitis.

Data was processed and analyzed using Epi-Info software, version 3.5.4 and Microsoft Excel 2007. Association of variables was analyzed by using odds ratio

(OR), at confidence interval of 95% (95% CI). We considered associations as significant when CI did not contain 1 or the P-value was less than 0.05.

The research protocol was approved by the administrative officers of KATWA and BUTEMBO Health zones **Figure 1**.

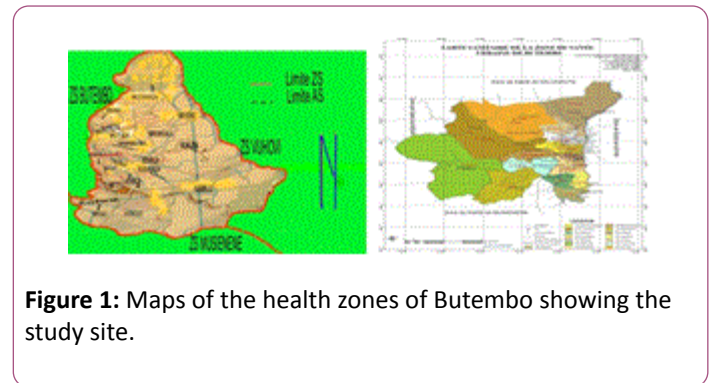


Figure 1: Maps of the health zones of Butembo showing the study site.

RESULTS

Prevalence of ear nose and throat diseases in 2017

During our survey of ear infections and their complications in Eastern of the Democratic Republic of the Congo carried out from 1st January 2017 to 31st December 2017 in Health facilities located in two Health zones in Butembo Health District, Eastern part of the Democratic Republic of the Congo, we found among 2865 patients admitted and diagnosed with Ear Nose and Throat diseases, 714 patients presented with ear infections, which is 24.9% (Figure 2).

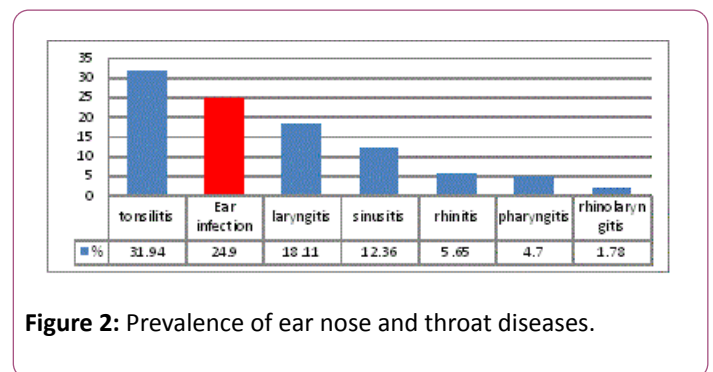


Figure 2: Prevalence of ear nose and throat diseases.

Prevalence of ear infections in health zones of Butembo city

Katwa health zone had a high prevalence of ear infections in Butembo city (61.34%) **Table 1**.

Table 1: Prevalence of ear infections in health zones.

Health zone	Effective	%
Katwa	438	61.34
Butembo	276	38.66
Total	714	100

Socio-demographic characteristics of patients with ear infections

The majority of our patients were young with an age range between 0 to 10 years; men were more affected than women with a ratio of 1.59. There was a high prevalence of ear

infections in patients coming from rural areas in our survey (29.82% in farming environment) versus 25.82% in urban environment **Table 2**.

Table 2: Ear infections and Socio-demographic characteristics.

Variable	Modali	Effective	Otitis	%	OR	CI 95%		P
						<	>	
Age (year)	0-10	1560	482	30.01	2.0679	1.7308	2.4708	0
	Nov-20	456	59	12.83	0.398	0.2984	0.5307	0
	21-30	363	81	22.31	0.8481	0.652	1.1032	0.22
	31-40	204	42	20.59	0.7674	0.5405	1.0894	0.14
	41-50	114	18	15.79	0.5536	0.3322	0.9226	0.02
	51-60	60	5	7.5	0.2688	0.1072	0.674	0
	71-80	86	25	23.61	1.2432	0.7744	1.9958	0.37
	>81	30	3	10	0.3319	0.1004	1.0975	0.06
	TOTAL	2865	714	24.92				
Gender	M	1575	438	27.78	0.7066	0.5944	0.8398	0
	F	1290	276	21.4	1.4159	1.1907	1.6822	0
	TOTAL	2865	714	24.92				
Origin	RURAL	342	102	29.8	1.3271	1.0347	1.7022	0
	URBAN	2418	612	25.3	1.1462	1.0347	1.4559	0.26
	TOTAL	2865	714	24.92				

Distribution of patients according to ear infections and their complications

Table 3: Type of ear infections and complications.

	Type	Effective	%
Ear infections	Otitis media	612	85.6
	Otitis Externa	95	13.35
	Otitis Inner	7	1.05
	Total	714	100
Complications	chronic Otitis	80	41.7
	mastoiditis	58	30.2
	Otitis Media with effusion	54	28.1

	Total	192	100
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Otitis media was most prevalent with 85.6% followed by otitis externa with 13.5% and otitis interna with 1.05%. Chronic otitis constituted the most frequent complication (41.7%) **Table 3**.

Discussion

During our survey of ear infections and their complications in eastern of the Democratic Republic of the Congo, the average age of our patients was similar to the one of H. Tall et al. in Senegal, who had found an average age of 26 years old [15]. In Mali, Keita carried out an otolaryngology survey in sub-Saharan, and found an average age of 31 years [16]. The majority of our patients were young with an age range between 0 to 10 years. This can be explained by the fact that ear infections principally affect children. This result is different from the one found by H. Tall et al. in Senegal, who found a high prevalence between 11 and 20 years old [15]. Otherwise, our results prove that children aged between 0 to 10 years old have twice the risk of developing an ear infection (p value<0.05). While the group aged from 71 to 80 years old had a risk of developing an ear infection with OR in 1.24, this risk is insignificant because the 95% confidence interval (CI) contained 1. Ear infections predominated in men in our survey. In 2013, Njifou et al. in Doula and H. Attifi et al. in Guinea-Conakry as well as Tall et al. in Senegal found a male predominance while Keita in Mali didn't find any predominance [15,17,18]. This predominance could be explained by the fact that men neglect to take care of their diseases in developing countries and also as the high rate of ear infections comes from rural areas where men may not take regularly ear care.

Even if the most of patients in our survey came from an urban area, the highest prevalence of ear infections was found in the rural area. Indeed, rural people are at increased risk of contracting an ear infection with an OR of 1.1462 and 0.26 of p value. However, urban people can develop otitis with OR of 1.146. This risk is insignificant because of the 95% CI contains 1. This could be due to the fact that in urban environment, hygiene may be better.

We found 714 patients presented with ear infections among 2865 patients seen and treated for ENT problems, representing 24.9%. This result is not different from the one of Tall et al. of Senegal that had found a prevalence of 24.7% [15]. However, our results are different from those found by H. Attifi et al. in Guinea. In his survey done in 2014, in Guinea-Conakry, of otolaryngology experience in a rural Moroccan hospital, H. Attifi found a prevalence of 27.9% [17].

Otitis media was most prevalent in our survey followed by otitis externa and otitis interna. These results are not far from the ones of H. Attifi et al. who found 75.19% for otitis media and 24.81% for the otitis externa, in his survey done in 2014, in Guinea-Conakry [17]. Moreover, Amana et al. found a prevalence of 11.9% for external otitis [19]. This can be explained by the fact that the diagnostic was found later because of the lack of specialist workers in our area. Otherwise, we found otitis media to be the most common otitis in children. According to the literature, paediatric patients are at high risk of

developing otitis media, as found by H. Teele et al. in their survey; otitis media was very common, with around 80% of children experiencing at least one episode by their third years old [20].

Chronic otitis constituted the most frequent complication in our survey. Our result is similar to the one of H. Attifi in Guinea-Conakry who found 49.6% in their population with ear infections [17]. This can be explained by the fact that many of our patients reach the health facilities late and the diagnosis can also be delayed; this indicates poor management of ear infections in our area. It has been estimated that there are 31 million new cases of chronic otitis per year worldwide, with 22.6% in children less than 5 years old [21]. The populations with the highest reported prevalence of chronic otitis are the Inuits of Alaska, Canada and Greenland, American Indians and Australian Aborigines [22,23].

Conclusion

Ear infections remain a serious public health problem in Butembo; early and detailed evaluation by an otolaryngologist might be a solution to the high rate of their complications in Eastern of the Democratic Republic of the Congo.

Conflicts of Interest

Authors declared that there are no conflicts of interest exist.

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