

# Clinicoepidemiological Survey of Tonsillitis in Ekiti State University Teaching Hospital, Nigeria

Waheed Atilade Adegbiyi<sup>1</sup>, Shuaib Kayode Aremu<sup>2,\*</sup>

<sup>1</sup>ENT Department, Ekiti State University Teaching Hospital, Ado Ekiti, Ekiti State, Nigeria

<sup>2</sup>Afe Babalola University, Ado-Ekiti, Ekiti State, Nigeria

**Abstract Background:** Tonsillitis is a common throat infection with poor documentation in developing countries. In this study, we aimed to evaluate the prevalence, sociodemographic features, clinicoepidemiological survey, and bacteriology of tonsillitis among patients in our practice. **Materials and Methods:** This was a prospective study of all patients with a diagnosis of tonsillitis at Ekiti state university teaching hospital, Ado Ekiti, Nigeria. Data was collected using a pretested interviewer assisted questionnaire. Bacteriological investigations of tonsils were done and results were recorded. Data obtained were collated and analyzed using SPSS version 18.0. **Results:** Prevalence of tonsillitis was 12.7%. There were 55.5% males and male to female ratio was 1.2:1. A family history of tonsillitis occurred in 65.9%. The commonest type of tonsillitis in this study was 59.1% recurrent tonsillitis. The majority 38.4% of the patients were referred by a paediatrician. The majority 70.7% of the patients were seen in the ear, nose, and throat outpatient clinic. Most of the patients presented with fever, sore throat, and odynophagia in 72.6%, 71.3%, and 60.4% respectively. Frequent findings on clinical examination were 54.9% enlarged tonsils and 52.4% neck pain/cervical lymphadenopathy. No bacteria were isolated from 25.0% patients while common isolated bacteria were 11.6% *Staphylococcus aureus* and 8.5% *Streptococcus* species. In this study, isolated *Streptococcus* species and *Staphylococcus aureus* showed 100% sensitivity to cefuroxime, gentamicin, azithromycin, and ceftazidime. Commonest associated complication was otitis media in 18.9%. **Conclusion:** Tonsillitis is quite a prevalent febrile illness with a sore throat and enlarged tonsils. Diagnosis is commonly omitted, poorly treated with associated complications at presentation to the specialist clinic.

**Keywords** Tonsillitis, Prevalence, Bacteriology, Febrile illness, Nigeria

## 1. Introduction

Tonsillitis is a throat disease that is characterized by the inflammation of the tonsils secondary to different types of infection [1,2]. The tonsils, palatine tonsils is one of the major lymphoid tissue in the lateral wall of the oropharynx. They help in the immune system which protects the body against various forms of infections that may enter through the upper aerodigestive tract [3].

It is major caused by various type viral or bacterial infection others were fungal and tuberculosis [4,5] Infected mucous from the patient are contagious and spread by contact with the mouth, throat or air droplet from sneezing. Infected tonsils are inflamed, enlarged, engorged, red, with or without yellow or white coating [6-11]. Post-treatment, the majority of the patient may recover completely or progress to recurrent tonsillitis or chronic tonsillitis [12]. Untreated or poorly treated cases may develop peritonsillitis,

peritonsillar abscess, parapharyngeal abscess, retropharyngeal abscess, and other forms of systemic complications.

There are different types of tonsillitis in clinical practice [11-14]. Acute tonsillitis occurred when the disease duration is less than three weeks. Subacute tonsillitis is when symptoms last between three weeks to three months. Recurrent tonsillitis is frequent attacks of acute tonsillitis over a year or two. Chronic tonsillitis is characterized by symptoms of tonsillitis last more than three months. Peritonsillar abscess when there is an accumulation of purulent suppuration in the peritonsillar capsule.

Patterns of clinical manifestations of tonsillitis depend on the type of tonsillitis. Common symptoms include a sore throat with associated referred otalgia, neck pain, and trismus in acute and recurrent tonsillitis [15]. Also, sore throat is associated with dysphagia and odynophagia in acute or recurrent tonsillitis. Chronic tonsillitis is associated with difficulty breathing, cough, snoring, halitosis, sleep apnoea, reduced appetite, and weight loss. Acute symptoms include fever, chills, and malaise. Associated constitutional symptoms are loss of appetite, nausea, vomiting, stomach ache, and furry tongue which may mimic other febrile

\* Corresponding author:

aremusk@abuad.edu.ng (Shuaib Kayode Aremu)

Received: Nov. 14, 2020; Accepted: Nov. 30, 2020; Published: Dec. 18, 2020

Published online at <http://journal.sapub.org/surgery>

illnesses. Clinical findings are enlarged cervical lymph node, swollen tonsils, pus on tonsils crypts [16-19].

There are only a few studies on tonsillitis in developing countries particularly in Nigeria in the literature. In this study, we aimed to evaluate the prevalence, sociodemographic features, clinicoepidemiological survey, and bacteriology of tonsillitis among patients in our practice.

## 2. Materials and Methods

This was a prospective hospital-based study of all patients with a diagnosis of tonsillitis at Ekiti state university teaching hospital, Ado Ekiti, Nigeria. This study was carried out over one year between July 2018 and June 2019.

Data was collected using a pretested interviewer-assisted questionnaire. Data were obtained on sociodemographic features. Others were presenting complaints such as sore throat, painful swallowing, difficulty breathing, cough, snoring, halitosis, sleep apnoea, fever, and malaise on the onset, duration, frequency, severity, relieving factor, and treatment. Ear, nose, and systemic symptoms were obtained and documented.

Detailed oropharyngeal, neck, ear, and nose examinations were done and findings were also documented.

Bacteriological investigations by tonsils swab were taken for microscopic, culture, and sensitivity tests. Results were obtained and findings were recorded.

Data obtained were collated and analyzed using SPSS version 18.0. The data were expressed with descriptive statistics by frequency distribution table, percentage, bar chart, and pie chart.

Ethical clearance for this study was sought and obtained from the ethical committee of the hospital. Informed consent was obtained from the enrolled patient, parent, or guardian.

## 3. Results

The total number of patients seen in the ear, nose, and throat department over the studied period was 1,296 out of which 164 patients had tonsillitis. The prevalence of tonsillitis was 12.7%.

All the studied age groups were involved with a peak age value of 81 (49.4%) at the first decade of life and the least age value of 1 (0.6%) at the extreme age group of  $\geq 61$  years. As illustrated in table 1.

There were 91 (55.5%) males and 73 (44.5%) females. Male to female ratio was 1.2:1. In this study, 69 (42.1%) were rural dwellers while 95 (57.9%) were urban dwellers. The majority 153 (93.3%) of the studied patients were Christian faith and 11 (6.7%) were Muslim faith. The common patients' educational level was 67 (40.9%) primary, 53 (32.3%) secondary, and 26 (15.9%) nil formal education. On parent/patient occupation status, majority 52 (31.7%)

were civil servant followed by 45 (27.4%) students/apprentice and 27 (16.5%) artisan. Patients with a family history of tonsillitis were commoner than a family without tonsillitis as in 108 (65.9%) and 56 (34.1%) respectively. As demonstrated in table 2.

The commonest types of tonsillitis in this study were 97 (59.1%) recurrent tonsillitis. Others were 43 (26.2%) acute tonsillitis and 24 (14.6%) chronic tonsillitis. This is showed in figure 1.

The majority of 63 (38.4%) of the patients were referred by paediatrician. This was followed by 54 (32.9%) family physicians and 32 (19.5%) casualty officer. As in figure 2.

Emergency presentations were less common in this study. The majority of 116 (70.7%) of the patients were seen in the ear, nose, and throat outpatient clinic. This was followed by an emergency ward and hospital ward in 47 (28.7%) and 1 (0.6%) respectively. As demonstrated in figure 3.

Most of the patients with tonsillitis presented with fever, sore throat, odynophagia, and otalgia in 119 (72.6%), 117 (71.3%), 99 (60.4%), and 92 (56.1%) respectively. Frequent findings on clinical examination were 90 (54.9%) enlarged tonsils, 86 (52.4%) neck pain/cervical lymphadenopathy, and 63 (63.4%) exudate on the tonsils. As illustrated in table 3.

Throat swab was taken from 93 (56.7%) inflamed tonsils. No bacteria were isolated from 41 (25.0%) patients throat swab while bacteria growth were isolated in 52 (31.7%) patients throat swab. Common isolated bacteria were 19 (11.6%) *Staphylococcus aureus*, 14 (8.5%) *Streptococcus* species, 7 (4.3%) *Pseudomonas aeruginosa*, 6 (3.7%) *Proteus* species and 4 (2.4%) *Klebsiella* species. This is showed in table 4.

In this study, *Streptococcus* species and *Staphylococcus aureus* from the different swabs showed 100% sensitivity to cefuroxime, gentamicin, azithromycin, and ceftazidime while *Staphylococcus aureus* further had 100% sensitivity to Amoxicillin and Streptomycin. Both showed some sensitivity to ampicillin and co-trimoxazole. As shown in table 5.

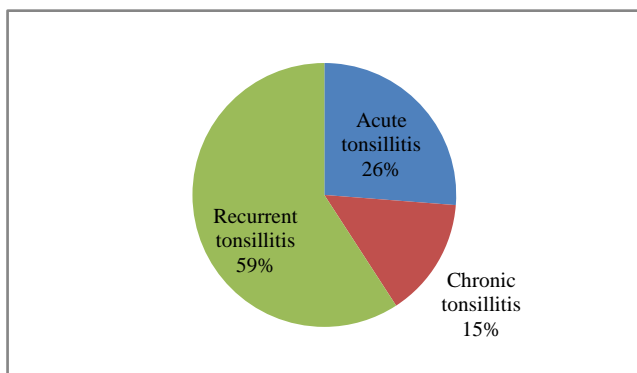
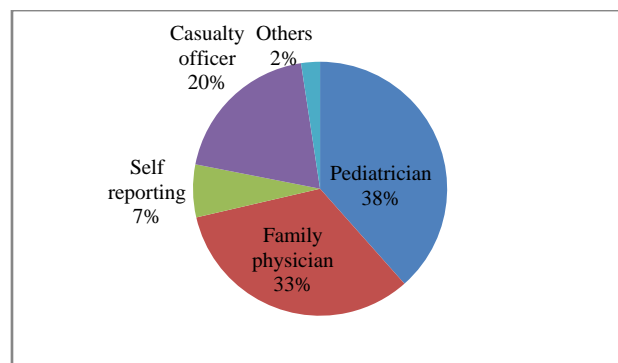
In this study, the commonest associated complication of tonsillitis was otitis media in 31 (18.9%). Others were 17 (10.4%) peritonsillitis and 6 (3.7%) peritonsillar abscess. As illustrated in figure 4.

**Table 1.** Age group distribution of the patients

Age (years)	Number	Percentage (%)
1-10	81	49.4
11-20	52	31.7
21-30	13	7.9
31-40	9	5.5
41-50	6	3.7
51-60	2	1.2
$\geq 61$	1	0.6
	164	100.0

**Table 2.** Sociodemographic features of the patients

Sociodemographic features	Number	Percentage (%)
<b>Sex</b>		
Male	91	55.5
Female	73	44.5
<b>Dwelling</b>		
Rural	69	42.1
Urban	95	57.9
<b>Religion</b>		
Christian	153	93.3
Muslim	11	6.7
<b>Education level</b>		
Nil formal	26	15.9
Primary	67	40.9
Secondary	53	32.3
Post secondary	18	11.0
<b>Parent/patient Occupation</b>		
Students/apprentice	45	27.4
Business	26	15.9
Artisan	27	16.5
Civil servant	52	31.7
Farming	14	8.5
<b>Family history of tonsillitis</b>		
Present	108	65.9
Absent	56	34.1

**Figure 1.** Types of tonsillitis among patients**Figure 2.** Sources of referral among patients**Table 3.** Clinical features among patients

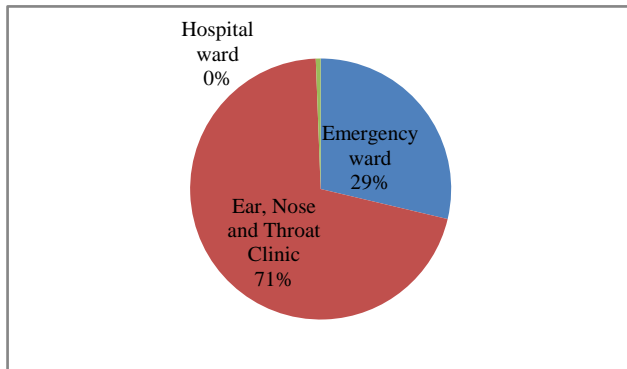
Clinical features	Number	Percentage (%)
Sore throat	117	71.3
Otalgia	92	56.1
Neck pain/cervical lymphadenopathy	86	52.4
Trismus	17	10.4
Odynophagia	99	60.4
Dysphagia/Loss of appetite	47	28.7
Difficulty breathing	13	7.9
Rhinorrhea	12	7.3
Enlarged tonsils	90	54.9
Halitosis	43	26.2
Fever	119	72.6
Exudate	63	38.4

**Table 4.** Microscopic of cultured organisms among patients

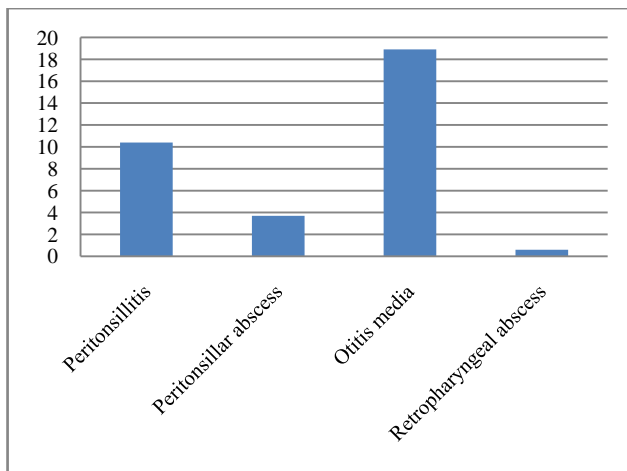
Microscopic, culture and sensitivity	Number	Percentage (%)
Streptococcus species	14	8.5
Staphylococcus Species	19	11.6
Klebsiella species	4	2.4
Proteus species	6	3.7
Escherichia coli	2	1.2
Pseudomonas aeruginosa	7	4.3
No growth	41	25.0

**Table 5.** Antibiotic sensitivity among the patients

Sensitivity	Strept. species n (%)	Staphyl. aureus n (%)	Klebsiella species n (%)	Proteus species n (%)	E. coli n (%)	Pseud. aeruginosa n (%)
Cefuroxime	14(100)	19(100)	4(100)	6(100)	1(50.0)	5(71.4)
Gentamicin	14(100)	19(100)	3(75.0)	6(100)	2(100)	7(100)
Azithromycin	14(100)	19(100)	4(100)	6(100)	0(0)	7(100)
Ceftazidime	14(100)	19(100)	3(75.0)	4(66.7)	0(0)	7(100)
Amoxicillin	12(85.7)	19(100)	2(50.0)	6(100)	1(50.0)	0(0)
Streptomycin	11(78.6)	19(100)	1(25.0)	6(100)	2(100)	2(28.6)
Ampicillin	9(64.3)	15(78.9)	2(50.0)	6(100)	0(0)	2(28.6)
Cephalexin	9(64.3)	15(78.9)	2(50.0)	6(100)	0(0)	2(28.6)
Floxapen	8(57.1)	15(78.9)	4(100)	4(66.7)	0(0)	2(28.6)
Cotrimoxazole	1(7.1)	5(26.3)	0(0)	4(66.7)	0(0)	0(0)



**Figure 3.** Pattern of presentation among patients



**Figure 4.** Complication of tonsillitis among patients (bar)

## 4. Discussion

Tonsillitis is a common throat disorder with poor epidemiological studies in developing countries including Nigeria. In this hospital-based study, the prevalence of tonsillitis was 12.7%. This prevalence was lower than findings from other studies [20,21]. The lower patient presented in this study center may be due to our peculiar sociocultural practice of treatment of sore throat with jin and spicy local concussion by the sufferer.

On sociodemographic features, tonsillitis is commoner in children and younger age groups compared to adults. A study conducted in Scotland also found tonsillitis to be commoner in children compared to adults [22]. This may be due to cross-infection among school children with the habit of sharing utensils and cups. Another contributing factor is the high incidence of family history of tonsillitis in this study [23]. The order of prevalence of families with tonsillitis were siblings, mother, father, and other relatives, and this is further determined by their closeness and family ties. Most patients with tonsillitis believed it is a minor illness and was not a communicable disease.

Prevalence of tonsillitis was higher in males than females in this study. This is contradictory to findings from the previous study in other parts of the world which revealed higher female prevalence [24]. This may be secondary to a

higher incidence of outdoor activities in males than females. More males feed outside the home in the eatery, cafeteria, and local food vendor sharing poorly treated cups and utensils after use. This habit was commoner among urban dwellers, businessmen, students, and apprentices in this study.

In this study majority of the patients were diagnosed with recurrent tonsillitis. Many patients and their relatives believe tonsillitis is a minor illness that can be cured with a homemade herbal concussion as a remedy. Also, some believe that it is a self-limiting disease. The second most common type of tonsillitis is acute tonsillitis followed by chronic tonsillitis they present early and late respectively. Both acute and recurrent tonsillitis mainly presented due to odynophagia which may be severe enough to cause total dysphagia or limit the patient to a liquid diet. The majority of chronic tonsillitis seek expert opinion due to persistent throat discomfort or obstructive symptoms.

The patients first approach to the treatment of tonsillitis was home care followed by over the counter drugs or pharmacy. Failure of all these cares usually the prompt patient or their relatives to contact a family physician for definitive treatment. Referral of the patient to specialist was mainly from the family physician or paediatrician if treatment failed. Unfortunately, the majority of the patient presents in ear, nose, and throat outpatient clinic in the subacute state. Few cases presented in casualty with complicated tonsillitis.

Majority of our patients presented with fever and sore throat. Many of the patients were treated as a case of either Malaria or Typhoid fever. Which are common causes of fever in the Malaria endemic zone. Unfortunately, the majority of the primary health care officer does not consider tonsillitis as one of their differentials in their diagnosis. Clinical examination of the oropharynx revealed enlarged inflammation of the tonsils. Oropharyngeal examinations are not routinely done and these findings are often omitted by the primary health care officer. This finding is contrary to the report from other studies [25,26].

In this study, no growth of bacterial was reported in about half of the throat swab sent for microscopy, culture, and sensitivity test. This is most likely due to wrong diagnosed Malaria or Typhoid fever and inappropriate antibiotics with another form of treatment. The most common isolated bacteria were *Staphylococcus aureus* which is followed by *Streptococcus sp* and *Pseudomonas aureginosa*. All these bacteria were found in acute tonsillitis and recurrent tonsillitis. Similar results were recorded from other studies on the most common isolated bacteria [27,28]. A contrary result was reported from another study [29]. These different findings may be due to different population studies, sociocultural practices, and types of abused antibiotics.

*Staphylococcus aureus* and *Streptococcus sp* in this study were found to be sensitive to Cefuroxime, Gentamicin, Azithromycin, Ceftazidime, Amoxicillin, Streptomycin, Ampicillin, Cephalexin, Floxapen, and Cotrimoxazole as in other studies [27,29]. Slight different results of some

antibiotics resistance were reported in other studies [21]. The observed differences in antibiotics sensitivity maybe after the wrong diagnosis and inappropriate antimicrobial administration. This practice leads to the waste of scarce resources, waste of precious time, exposure to toxic effects of drugs and promotes the emergence of resistant bacteria.

Wrong diagnosis and poor treatment were the main causes of complicated tonsillitis in this study. The main encountered complications were otitis media, peritonsillitis, and peritonsillar abscess. These are avoidable if accurate diagnosis and prompt treatment were instituted.

## 5. Conclusions

In this study, tonsillitis was found to be common in all age groups and presents mainly with fever, sore throat, and tonsil enlargement. The condition is commonly misdiagnosed for other causes of fever and wrongly treated. The majority had recurrent tonsillitis and *Staphylococcus aureus* with *Streptococcus* species were isolated and sensitive to common antimicrobials. There were associated avoidable complications at presentation. Differentials of tonsillitis should be considered in patients with febrile illnesses.

## Funding

There was no financial support. It is a self-sponsored research study.

## REFERENCES

- [1] Georgalas CC, Tolley SN, Narula A. Tonsillitis. *BMJ Clin Evid*. 2014; 2014: 0503.
- [2] Stelter K. Tonsillitis and sore throat in children. *GMS Curr Top Otorhinolaryngol Head Neck Surg*. 2014; 3: 1-24.
- [3] Brandtzaeg P. Immune functions of nasopharyngeal lymphoid tissue. *Adv Otorhinolaryngol*. 2011; 72: 20-4.
- [4] Babaiwa UF, Onyeagwara NC, Akerele JO. Bacterial tonsillar microbiota and antibiogram in recurrent tonsillitis. *Biomedical Research*. 2013; 24(3).
- [5] Okoye EL, Obiwezuozor CJ, Uba BO, Odunukwe FN. Epidemiological Survey of Tonsillitis Caused By *Streptococcus pyogenes* among Children in Awka Metropolis (A Case Study of Hospitals in Awka Community, Anambra State). *IOSR Journal of Pharmacy and Biological Sciences*. 2016; 11(3): 54-58.
- [6] Bartlett A, Bola S, Williams R. Acute tonsillitis and its complications: an overview. *J R Nav Med Serv*. 2015; 101(1): 69-73.
- [7] Windfuhr JP, Toepfner N, Steffen G, Waldfahrer F, Berner R. Clinical practice guideline: tonsillitis I. Diagnostics and nonsurgical management. *Eur Arch Otorhinolaryngol* 2016; 273(4): 973-87.
- [8] Bajaj Y, Hore L. Diseases of the tonsils, Tonsillectomy, and Tonsillotomy. In: Watkinson JC, Cark RW, editors. *Scott-Brown's Otorhinolaryngology Head and Neck Surgery*. 2. Boca Raton: CRC Press, 2018, 435-41.
- [9] Pelucchi C, Grigoryan L, Galeone C, et al. Guideline for the management of acute sore throat. *Clin Microbiol Infect* 2012; 18: 1-28.
- [10] Lau AS, Upile NS, Wilkie MD, Leong SC, Swift AC. The rising rate of admissions for tonsillitis and neck space abscesses in England, 1991-2011. *Ann R Coll Surg Engl* 2014; 96: 307-10.
- [11] Ozkiris M, Kapusuz Z, Saydam L. Comparison of three techniques in adult tonsillectomy. *Eur Arch Otorhinolaryngol* 2013; 270: 1143-1147.
- [12] Keskin H, Guvenmez O. A New Treatment Modality to Reduce Acute Tonsillitis Healing Time. *J Popul Ther Clin Pharmacol*. 2019; 26(2): e14-e1.
- [13] Bellussi LM, Marchisio P, Materia E, Passali FM. Clinical guideline on adenotonsillectomy: the Italian experience. *Adv Otorhinolaryngol*. 2011; 72: 142-5.
- [14] Chiappini E, Regoli M, Bonsignori F, Sollai S, Parretti A, Galli L, de Martino M. Analysis of different recommendations from international guidelines for the management of acute pharyngitis in adults and children. *Clin Ther*. 2011 Jan; 33(1): 48-58.
- [15] Gahleitner C, Hofauer B, Stark T, Knopf A. Predisposing factors and management of complications in acute tonsillitis. *Acta Otolaryngol*. 2016; 136(9): 964-8.
- [16] Kordeluk S, Novack L, Puterman M, Kraus M, Joshua BZ. Relation between peritonsillar infection and acute tonsillitis: myth or reality? *Otolaryngol Head Neck Surg*. 2011; 145(6): 940-945.
- [17] Tagliareni JM, Clarkson EI. Tonsillitis, peritonsillar and lateral pharyngeal abscesses. *Oral Maxillofac Surg Clin North Am*. 2012; 24(2): 197-204, viii.
- [18] Al-Layla A, Mahafza TM. Antibiotics do not reduce post-tonsillectomy morbidity in children. *Eur Arch Otorhinolaryngol*. 2013; 270(1): 367-70.
- [19] Del Mar CB, Glasziou PP, Spinks AB. Antibiotics for sore throat. In: *The Cochrane Library*, Issue 4, 2014. Chichester, UK: John Wiley & Sons, Ltd.
- [20] Karevold G, Kvestad E, Nafstad P, Kvaerner KJ. Respiratory infections in schoolchildren: co-morbidity and risk factors. *Archives of disease in childhood*. 2006 May 1; 91(5): 391-5.
- [21] Abraham ZS, Bazilio J, Kahinga AA, Ntunaguzi JMD, Massawe ER. Prevalence and Bacteriology of Tonsillitis among Patients attending Otorhinolaryngology Department at Muhimbili National Hospital, Dar es Salaam-Tanzania. *Medical Journal of Zambia*. 2019; 46(1): 33-40.
- [22] Hannaford PC, Simpson JA, Bisset AF, Davis A, McKerrrow W, Mills R. The prevalence of ear, nose and throat problems in the community: results from a national cross-sectional postal survey in Scotland. *Family practice*. 2005; 22(3): 227-33.
- [23] Khasanov SA, Asrorov AA, Vokhidov UN. Prevalence of chronic family tonsillitis and its prevention. *Vestnik*

otorinolaringologii. 2006; (4): 38-40.

- [24] Alasil S, Omar R, Ismail S, Yusof MY, Ameen M. Bacterial identification and antibiotic susceptibility pattern of *Staphylococcus aureus* isolates from patients undergoing tonsillectomy in Malaysian University Hospital. *African Journal of Microbiology Research*. 2011; 5(27): 4748-52.
- [25] Baum E, Beck C, Donner-Banzhoff N, Meyer F, Werner A. Clinical findings in patients with sore throat A study on intra-observer reliability. *The Journal of Family Practices*. 2010; 19: 466-468.
- [26] Bates W, Lee M, Finkelstein A, Linder D. Antibiotic treatment of children with sore throat. *The Journal of the American Medical Association*. 2005; 294: 2315-2322.
- [27] Agrawal A, Kumar D, Goyal A, Gupta R, Bhooshan S. Bacteriological evaluation and their antibiotic sensitivity pattern in tonsillitis. *IOSR J Dental Med Sc*. 2014; 13(3): 51-4.
- [28] Hammouda M, Abdel-Khalek Z, Awad S, Abdel-Aziz M, Fathy M. Chronic tonsillitis bacteriology in Egyptian children including antimicrobial susceptibility. *Australian Journal of Basic and Applied Sciences*. 2009; 3(3): 1948-53.
- [29] Sadoh WE, Sadoh AE, Oladipo AO, Okunola OO. Bacterial isolates of tonsillitis and pharyngitis in a paediatric casualty setting. *Journal of Medicine and Biomedical Research*. 2008; 7(1-2).