RESEARCH ARTICLE

The analysis of risk factors associated with tonsillitis in district Mardan, Pakistan

Dost Muhammad Khan,[1] Muhammad Hamraz,[2] Alam Zeb Khattak,[3] Ishfaq Ali,[4] Umair Khalil,[5] Zardad Khan[6]

Abstract

Objective: To assess the risk factors associated with tonsillitis.

Methods: The cross-sectional study was conducted at Mardan Medical Complex and District Headquarter Hospital, Mardan, Pakistan, from January to June 2018, and comprised tonsillitis patients. Data was collected using a questionnaire which included different risk factors like age 1-10 years, gender, residential area, dietary habit etc. Data was analysed using SPSS 20.

Results: Of the325 subjects, 200(61.54%), were clinically diagnosed with tonsillitis; 138(69%) being males. Age, unhygienic living condition, balanced diet, stressful environment and the use of sore/spicy foods were identified as significantly associated factors ($p<0.05$).

Conclusion: Age, unhygienic living condition, balanced diet, stressful environment and the use of sore/spicy food were found to have a strong association with tonsillitis.

Keywords: Tonsillitis, Risk factors, Chi-square, Stepwise logistic regression. (JPMA 70: 1169; 2020)

DOI: https://doi.org/10.5455/JPMA.15375

Introduction

Tonsillitis is an acute inflammation of the tonsils characterised by pain in throat, fever, anterior cervical adenopathy and tonsillar exudates. Tonsils are located in the oral cavity on both right and left sides at the entrance of the air tract. They work as first-line defence against all harmful pathogens and foreign bodies. They are responsible for collecting all harmful organisms which try to enter the body. Tonsillitis is the most common throat disorder among children.[1]

Preventing rheumatic fever along with its major effects on the heart and nervous system has been a major concern in the treatment of streptococcal tonsillitis after the advent of penicillin in the 1940s. Less prevalence of rheumatogenic strains of group A beta haemolytic strep has been observed recently and they are only found in small pockets such as in Salt Lake City, United States.[1] It exposes to question the rationale for treating tonsillitis as a way of stopping rheumatic fever.

Earlier studies on tonsillitis indicated that 15-30% of sore throats in children and 5-10% sore throats in adults are bacterial tonsillitis. In the United Kingdom, 100 cases are reported of recurrent sore throat among 1000 population in a year.[3]

[1,2,4,5]Department of Statistics, Abdul Wali Khan University Mardan, [3]Department of Psychology, International Islamic University Islamabad, Pakistan, [6]Department of Mathematical Sciences, University of Essex, United Kingdom.

Correspondence: Dost Muhammad Khan.

Email: dostmuhammad@awkum.edu.pk

Tonsillitis may be caused by bacteria or virus. The one that is mostly involved in tonsillitis infection is group A beta haemolytic streptococcus pyogenes. Bacterial tonsillitis is more common in children aged 5-15 years, while viral tonsillitis is more common in younger children due to undeveloped immunity. Viruses which are causing tonsillitis include rhinovirus, influenza, para-influenza virus, adenovirus, rubella and Epstein-Barr virus. Tonsillitis is caused when the viruses infiltrate the tonsils and develop inflammation.[4,5]

In a study in Rawalpindi, 100 patients suffering from tonsillitis aged 5-30 years were selected for tonsillectomy. After a follow-up of 12 months it was observed that out of 100 cases 99 showed improvement.[6]

A study[7] has shown that upper and lower respiratory infection is common in children aged 10 years, and concluded that environmental and constitutional factors are positively correlated with the (upper and lower airway) infections. Another study[8] analysed different risk factors to check their association with tonsillar malignancy and it was found that age, tonsillar asymmetry, history of cancer, and neck mass were highly correlated with the malignancy of tonsils in adults. One study[9] showed that there was positive association between the human papilloma virus (HPV) and tonsillar cancer.

Tonsillitis is of three types:

Acute tonsillitis may be bacterial or viral characterised by tonsillar oedema, odynophagia, fever, rhinorrhea, cough and headache. It may be treated through medication.

Chronic tonsillitis is diagnosed when the infection

persists for 3 months. In most cases the viruses stay persistently or it results from repeated allergies or infections.

Recurrent tonsillitis is mostly due to bacterial invasion. Symptoms of recurrent tonsillitis are mostly like acute tonsillitis. Surgical removal of the tonsils is recommended when the same individual is infected 7 times in a single year.[5]

Common risk factors of tonsillitis are young age, residential area, living in pathogens-exposed environment, living in colder climate, use of contaminated water etc.

Preventive measures include contact limitation with already infected individuals, contact limitation with immune-compromised patients, adequate rest in case of infection, isolation in case of severe infections, use of antibiotics according to culture sensitivity, rehydration through intravenous (IV) infusion in case of severe infection, proper vaccination, hand wash thoroughly especially after using the toilet and before eating, avoiding sharing of utensils and food, and coughing or sneezing into a tissue or handkerchief etc.[10]

The Ear Nose Throat (ENT) departments of public-sector hospitals of district Mardan accommodate tonsillitis patients from different parts of the Khyber Pakhtunkhwa (KP) province. The current study was planned to identify the different risk factors of tonsillitis in Mardan.

Patients and Methods

The cross-sectional study was conducted at Mardan Medical Complex and District Headquarters (DHQ) Hospital, Mardan, Pakistan, from January to June, 2018.

The sample size was calculated in line with literature[11] using the formula: Sample size=10× d/p.

Herein, 'd' is the covariate and 'p' is the proportion.

After informed consent, data was collected from patients of tonsillitis through a predesigned questionnaire comprising questions on different potential risk factors, like age, gender, stressful environment, residential area, balanced diet, parental awareness, eating sore/spicy edibles, steroid medication, etc.

The Cronbach's alpha value was 0.65. The association of different risk factors with tonsillitis was worked out using logistic regression with stepwise procedure.[12,13] Data was analysed using SPSS 20. Approval for the study was obtained from institutional ethics review board of Abul Wali Khan University, Mardan, KP.[14]

Results

Of the 600 patients who visited the departments at the

Table-1: Chi-Square analysis of risk factors in association with tonsillitis.

Factors	Categories	Response		d.f	Chi-square values	P-values
		Yes	No			
Age	Less than 5	139	53	1	23.367	
	5 to 10	61	72			0
Gender	Male	138	87	1	0.013	
	Female	62	38			0.909
Area of Respondent	Urban	106	62	1	0.356	
	Rural	94	63			0.551
Family History	Yes	83	59	1	1.15	
	No	117	65			0.284
Steroid medication	Yes	35	13	1	3.08	
	No	165	112			0.079
Ice-cream & Cold drinks use	Yes	92	68	1	2.172	
	No	108	57			0.141
Parental Awareness	Yes	77	56	1	1.263	
	No	123	69			0.261
Balanced Diet	Yes	145	56	1	25.013	
	No	55	69			0
Unhygienic/polluted environment	Yes	160	66	1	26.867	
	No	40	59			0
Consumption of sour/spicy edibles	Yes	137	58	1	15.654	
	No	63	67			0
Stressful environment	Yes	141	66	1	10.4212	0.001
	No	59	59			

Table-2: Parameter estimates through stepwise logistic regression.

Variables	Coefficients	Standard error	Wald statistics	Sig.	Odds ratio	95% C-I for O.R Lower	Upper
Age	1.264	0.266	22.554	0.000	3.538	2.100	5.960
Hygienic environment	0.260	0.251	1.076	0.000	1.297	0.793	2.121
Stressful environment	0.814	0.245	11.021	0.000	2.256	1.395	3.647
Consumption of sore/spicy edibles	0.822	0.246	11.145	0.000	2.275	1.404	3.685
Constant	-0.344	0.264	1.700	0.000	0.709	---	---

two hospitals, 325(54.16%) volunteered to participate. Among them, 200(61.54%) patients were clinically diagnosed with tonsillitis; 138(69%) being males. Patients aged <5 years were 139(69.5%). The disease was more prevalent in urban areas 106(53%). Patients with family history of tonsillitis were 83(41.5%), and 165(82.5%) had no past exposure to steroid medication. Awareness level was acceptable in 123(61.5%) patients. Those who used a balanced diet numbered 145(72.5%). Also, 160(80%) patients lived in unhygienic/polluted environment; 137(68.5%) were in the habit of consuming sore/spicy food; and 141(70.5%) were facing stressful environment. Age, unhygienic/polluted living condition, balanced diet, stressful environment and the use of sore/spicy foods were statistically significant factors (Table-1).

Logistic regression indicated that age, unhygienic living condition, stressful environment and the use of sore/spicy food were highly significant (Table-2).

Discussion

The study found a strong association of tonsillitis with age, unhygienic living condition, balanced diet, stressful environment and the use of sour/spicy foods. The disease was more prevalent in males compared to females and children aged <5 years were more vulnerable to the disease which is in line with an earlier study.[15] In younger age, the tonsils can easily become overwhelmed with infection.[16] According to a study, in children aged up to 6 years the tonsils are larger in size than the adults, which make them an easy target to tonsillitis.[17] Stressful environment also played a significant role in causing tonsillitis because stress may increase the possibility of acute respiratory infection in children and this increases with the level of stress.[18,19] In our study unhygienic/polluted environment was also found to have vital role in causing tonsillitis which agrees with earlier findings.[17] Children who consumed sore/spicy foods were at high risk of tonsillitis which also confirmed earlier findings in this regard.[17]

In the current study, the urban-rural divide had no significant role in causing tonsillitis, which is in contrast with the findings of an earlier study[20] where the prevalence of the disease was lower in large cities. This factor could be explored further in future studies.

Conclusion

Age, unhygienic living condition, stressful environment and the use of sour/spicy foods were found to be significant factors associated with tonsillitis.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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