

Research Article

Upper respiratory tract infections in children age 2 to 10 years in Quetta: A prevalence study

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Abstract

The present study was carried out to assess the prevalence of upper respiratory tract infection (URTIs) in children at combined military hospital (CMH), Quetta from September, 2017 to April, 2018. The data were sampled by visiting the Pediatrician office and outpatient department (OPD) weekly. Of the total children examined, 64 were male and 36 were females (Age range 2-10 years). Out of 100 patients evaluated, ratio of URTIs was 41%, 25%, 20%, 12% and 2% in the form of Pharyngitis, Tonsillitis, Laryngitis, Rhinitis and Sinusitis respectively. Pharyngitis showed highest prevalence in male was 50% while Tonsillitis was the most prevalent (42%) compare to Laryngitis (25%) in females. Children aged 2-5 years were found more infected (56%) by Pharyngitis like complication than children with 7-10 (28%) and 5-7 (16%) years of age. Highest ratio of Tonsillitis (50%) was found in patients of 7-10 years followed by 32 and 16 percent prevalence in the patients were 5-7 and 2-5 years old. Sinusitis was least prevailed sex wise (males=3%), (females= 2%), however, it was found slightly higher (11%) in patients aging 7-10 years. This is the first study in children with URTIs conducted in Quetta that can help the parents to take proper health care of underage children. It emphasizes the need of up-to-date facilities and infra-structure in our setup to improve treatment outcomes in this respiratory tract infections.

Keywords: Children; Under ten years; URTIs; Quetta

Introduction

Upper respiratory tract infections are the most common, widespread infectious disease usually referred to the word form URTIs [1]. It is the illness caused by an acute infection which involves the upper respiratory tract: nose, sinuses, pharynx, larynx, or ear. The Upper respiratory tract consists of air-passage from the nostrils to the vocal cords in the larynx, including the para-nasal sinuses

and the middle ear, which pertain direct invasion of the mucosal lining of the upper air-passage. Among children, this disease constitute throat pain, cough, stuffy or running nose, enlarge tonsils, noisy breathing, body ache, fatigue and anorexia [2]. URTIs is a global problem occurs in both community and health care settings account for over 50 million deaths each year [3]. URTIs include rhinitis (common cold),

sinusitis, ear infections, acute pharyngitis or tonsillo-pharyngitis, epiglottitis, and laryngitis, of which ear infections and pharyngitis cause deafness and acute rheumatic fever respectively [4].

Respiratory tract infections affects more commonly children and constitute one third of the deaths in under five in low income countries [5]. The World Health Organization [6] estimates that respiratory infections account for 6% of the total global burden of disease compared with the load of diarrhea disease, cancer, human immunodeficiency virus (HIV) infection, ischemic heart disease or malaria [7]. Nevertheless, such infections still responsible for over a third of pediatric refer to primary care in the United Kingdom and the United States [8, 9]. Acute respiratory tract infections (ARTIs) account for over 12 million hospital admissions in children less than 5 years and antibiotics are usually prescribed in many countries despite limited evidence of potency [10]. In a comparative study conducted 16 years on the reason and circumstances of death in northern Cameroon making ARTIs one of the leading public health concerns in under-fives in Cameroon. Of all, 67% deaths were in children, and a bulk 24% (167) of the deaths were caused by ARIs, followed by malaria 21% (152) and diarrheal diseases 19% (133) [11].

ARTIs is a major cause of morbidity and mortality in children worldwide, and nearly 6.6 million children under-five die every year globally [12] 95% of them in low-income countries, and one third of the total deaths (1.3 million) is due to only the said disease [13, 14]. More than 200 viruses contribute to the clinical syndrome of cough, nasal congestion, nasal discharge, sore throat, and sneezing [15, 16]. Most adults in the United States experience 2 to 4 URTIs per year, and most children experience 6 to 10 per year, which carries enormous population morbidity due to the high incidence of

disease and disruption caused by symptoms [8, 17]. Acute respiratory tract infections comprised a total of 8954 (32%) of all the infections in 27,963 patients in Khyber Pakhtun Khwa province, Pakistan during the period of 4 months in 2009. Its highest prevalence was observed in children less than five years of age [18].

The present research study was conducted on different types of upper respiratory tract infections in children two to ten years of age in Quetta. This paper will help to design other research studies on the prevalence of URTIs in children aged 2-10 years where the majority of hospitals admissions are due to infectious diseases. Therefore, it will contribute toward evolving inter-invention strategies to let down the burden of respiratory tract diseases in the pediatric age group in the region.

Materials and methods

Study area

The current study was conducted between September 2017 to April 2018 in Combined Military Hospital (CMH) Quetta. CMH is located in the north-east of provincial capital (Quetta) cantonment area with the Gps coordinates of Latitude: 30.215°N and Longitude: 67.030°E. The city is at an average elevation of 1680 meters (5510 feet) above sea level with an mean annual temperature (15.8 °C) and mean annual rainfall 244 mm (Pakistan Meteorological Department in Quetta). Ethical approval was taken both from the institutional committee for higher studies & research board, University of Balochistan Quetta and the department of Paediatrics at combined military hospital (CMH) Quetta cantt. Parents or guardians signed a written informed consent form, as approval for their children to be participants.

Sampling

The data were sampled by visiting the pediatrician office, or hospital outpatient departments (OPD) on different dates from

September 4, 2017 to February 26, 2018. The focus of this study was only on office-based and hospital-based outpatient visits. The characterization of age done from 2-5 years, 5-7 years and 7-10 years. Cross tabulation and binary logistic regression techniques were computed to fulfill the requirements of the objectives of the present study with the help of SPSS software.

Identification of URTIs

Children aged 24 months to 10 years only were included in the study. During this period, visits of children diagnosed with URTI complaints were identified by the consultant pediatrician from combined military hospital (CMH), and a designed questionnaire was managed by the chief investigator. In data sets, up to 5 distinct diagnoses were made for each visit in accordance with criteria from the International Classification of Diseases.

Statistical analysis

The chi square test was used to evaluate significance of associations between sex and URTIs; age and URTIs, which were coded as categorical variables. A P value of 5% (2-tailed) level of significance was considered statistically significant. All statistical analyses were conducted using SAS software version 9.4.

Results

During the present study a total of 100 children visited the hospital, ten children were under 2 years of age. A majority (64%) were male and aged between 2 to 7.8 years with an average age of 3.9 years than female 3.2 to 10 years having 3.13 years mean age. Pharyngitis showed high prevalence (41%) compared with tonsillitis (25%), laryngitis (20%), rhinitis (12%) and sinusitis (2%) as shown in figure 1. Out of one hundred, sixty four male (64%) and thirty six female (36%) children had an URTIs (pharyngitis, laryngitis, tonsillitis, rhinitis and sinusitis) as diagnosed by the consultant were in the following ratios: 50.0%, 17.25%, 15.6%,

15.65% and 1.65% vs .25.0%, 25.0%, 41.7%, 5.6% and 2.8% respectively (Table 1 & figure 2). The relationship between sex and URTIs were significant at 5% level by chi-square test. The proportion of URTIs (pharyngitis, laryngitis, tonsillitis, rhinitis and sinusitis) in children aged 2-5 years were 56.1%, 22.8%, 14.0%, 7.0%, 0.0%; 5-7 years as 16.0%, 20.0%, 32.0%, 32.0%, 0.0%), and among children aged between 7-10 years in the pursuing ratio, 27.8% 11.1%, 50.0%, 0.0%, 11.1% respectively (Table 2). Age and URTIs were also found significantly associated at 5% level of significance.

Discussion

In the present study (September 2017 to February 2018), overall prevalence of URTIs was found to be 45% (Figure 1). Our study are comparable with study done by Rahman and Rahman [19, 20] where they observed nearly similar results found to be 47% and 44% respectively. A local study by Samoo *et al.* [21] observed higher proportion (62.5%) of URTIs in males than female children was 37.5%. Table 1 indicated sinusitis as the least prevailed complication observed only in 1.6% (1/64) male and 2.8% (1/36) females. However, there are some pediatric studies and most have various limitations. A study [13] found a higher proportion (14-61%) of URTIs in children (under five years) compared to the 8-56% found in our and other studies [19, 20]. This differences in the proportions of URTIs could be as a result of variation in age groups studied, different study populations, and different study settings.

In the present study sex-wise prevalence of URTIs were more prevalent as pharyngitis in boys than in girls when compared with laryngitis, tonsillitis. Rhinitis and sinusitis (Figure 2). The present study established a significant relationship between URTIs and sex at 5% level of significance. It was also found that most of the male children 32/64 (50%) with URTIs were diagnosed with

pharyngitis compared to females 9/34 (25%) (Figure 2). The predominance of males might be because of being more vulnerable to infections secondly, the society pays no attention to the health of girls in low-economy countries like us, therefore, seek early medical help for their survival [22]. In contrast, 41.7% of the children (15/36) are diagnosed with tonsillitis were females. Although tonsillitis was not as common as pharyngitis noted in the present study. According to age-wise, more UTRIs cases

were seen in 2-5 years of age group include 45.0% males and 12.0% females. This group had more URTIs with pharyngitis (56.1%) and laryngitis (22.8%) than their comparative age groups while children between 7-10 years had higher Tonsillitis prevalence (50%) compare to others (Figure 3). It may be assumed that environmental factors like exposure to wood smoke, cigarette smoke, and contact or living with someone who had a cough were found to significantly increase the proportion of URTIs [23-25].

Table 1. Relationship between Sex and URTIs

Sex		URTIs					Total
		Pharyngitis	Laryngitis	Tonsillitis	Rhinitis	Sinusitis	
Male	Count	32	11	10	10	1	64
	% within sex	50.0%	17.2%	15.6%	15.6%	1.6%	100.0%
Female	Count	9	9	15	2	1	36
	% within sex	25.0%	25.0%	41.7%	5.6%	2.8%	100.0%
Total	Count	41	20	25	12	2	100
	% within sex	41.0%	20.0%	25.0%	12.0%	2.0%	100.0%

Chi-Square Tests: 12.582^a, df= 4, Asymptotic 2-sided significance =.014 at *P*- value = 0.05
Relationship between sex and URTIs is found significant at 5% by chi-square test

Table 2. Relationship between Age and URTIs

Age (Binned)		URTIs					Total
		Pharyngitis	Laryngitis	Tonsillitis	Rhinitis	Sinusitis	
2-5 years	Count	32	13	8	4	0	57
	% within age (Binned)	56.1%	22.8%	14.0%	7.0%	0.0%	100.0%
5-7 years	Count	4	5	8	8	0	25
	% within age (Binned)	16.0%	20.0%	32.0%	32.0%	0.0%	100.0%
7-10 years	Count	5	2	9	0	2	18
	% within age (Binned)	27.8%	11.1%	50.0%	0.0%	11.1%	100.0%
Total	Count	41	20	25	12	2	100
	% within age (Binned)	41.0%	20.0%	25.0%	12.0%	2.0%	100.0%

Chi-Square Tests: 37.216^a, df= 8, Asymptotic 2-sided Significance =.0000 at *P*- value = 0.05
Relationship between age and URTIs is found significant at 5% by chi-square

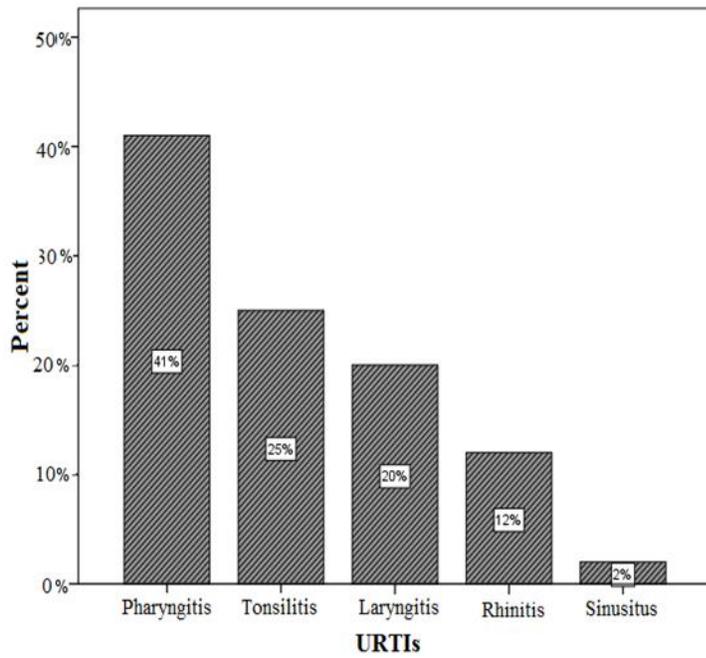


Figure 1. Proportion of different types of URTIs evaluated in the present study in children aged 2 to 10 years

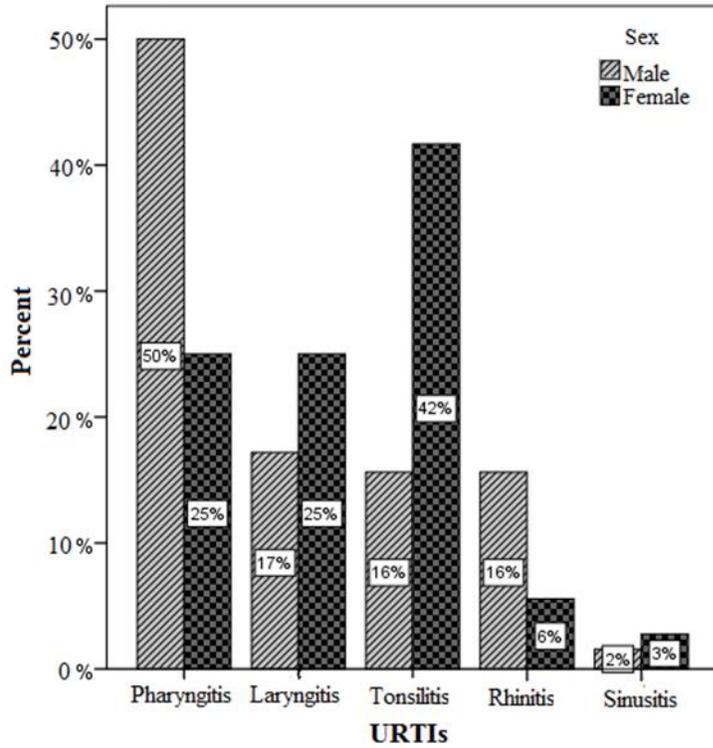


Figure 2. Sex wise proportion of different types of URTIs evaluated in the present study in children aged 2 to 10 years

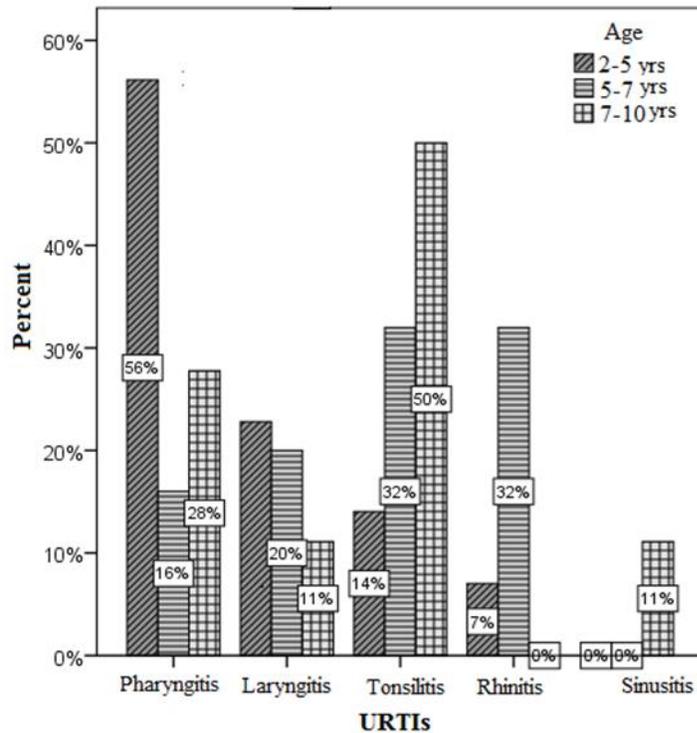


Figure 3. Age wise proportion of different types of URTIs evaluated in the present study in children aged 2 to 10 years

Conclusion

The ratio of URTIs among 64 male and 34 female children was 45%. Pharyngitis and tonsillitis were the most prevailing complications diagnosed in males, and the later in female children. Pharyngitis and tonsillitis were also found as the most prevalent cases of URTIs determined age wise. From the findings of this study it is concluded that male children are more vulnerable to infection, associated with exposure to wood and cigarette smoke and or contact with person having acute respiratory tract infections. It is suggested that measures should be taken by the ministry of public health to slake these conditions and prevent its spread and severity will reduce the morbidity and mortality associated with this problem.

Authors' contributions

Conceived and designed the experiments: N Shoukat, A Kakar, Performed the experiments::SA Shah & N Shoukat, Analyzed the data: F Iqbal & A Kakar, Contributed reagents/ materials/ analysis, tools: N Shoukat & A Sadiq, Wrote the paper: A Kakar.

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