

Pattern of ENT Diseases in Children: A Peripheral Military Hospital Based Study

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This study was aimed to find out the hospital based prevalence of paediatric ENT disorders in an ENT OPD of a peripheral military hospital of Bangladesh Armed Forces. This observational study was carried out at ENT out patient department of CMH Momenshahi, from 1st April 2017 to 31st March 2020. Irrespective of age and sex a total of 4612 children, between the ages of 0-14 years were included in this study. All types of ENT disorders were taken in to account. Data were obtained after ENT examination and necessary investigations. Total 4612 cases were studied. Male children (52.2%) were affected more and most of the children belongs the 6-10 years age group (44.4%). Throat related disorder (40.7%) were predominant followed by ear (34.8%). The most common ENT disorders were Chronic Tonsillitis (21.8%) followed by acute otitis media (16.1%) and pharyngitis (9.8%). Rate of Chronic otitis media (COM) was only 46(1%). ENT diseases are one of the major health problems among children. In addition to improved health education, socioeconomic status and better access to health care facilities; provision of early ENT specialist consultation may significantly reduce chronic or recurring symptoms and long term morbidities of common ENT disorders in children.

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Key words: ENT disease, Children, Combined military hospital

Introduction

In Bangladesh 26.48% of the total population belongs to children aged 0-14 years¹. Otolaryngology consultation are more common in children than in adults as pediatric population are easily affected by ear, nose, throat disorders, because of various factors like anatomical variation (wider and horizontal) of eustachian tube, under developed immunity, poor hygiene and lower socioeconomic status etc^{2,3}. Commonly faced ENT problems are otitis media, tonsillitis, adenotonsillitis, adenoiditis, rhinitis, sinusitis, otitis media with effusion (OME), epistaxis, foreign body in ear-nose-throat, and impacted wax etc^{3,4,5}. Beside these conditions like cervical lymphadenopathy, DNS, headache, traumatic injury ear/nose, keloid (ear lobule), pubertal goiter, salivary gland infections, aphthous ulcer and nasal vestibulitis care typically evident in pediatric age group. Delayed diagnosis and inadequate management can lead to recurrent symptoms and produce long-lasting morbidity like deafness due to otitis media, OME etc. According to WHO about 34 million children is suffering from hearing disability⁶. This ultimately hinders overall growth and skill development of a child. Currently few studies are available regarding prevalence of paediatric ENT disorder in

Bangladesh which described that otitis media (acute and chronic), rhinitis and tonsillitis etc are the most prevalent ENT disorder among paediatric population in Bangladesh^{3,7}.

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Original Contribution

Military Hospitals/Combined Military Hospital (CMH) deals with Armed Forces personnel and their families only. A good number of paediatric patients reported to CMH for ENT consultation. There is paucity of data regarding prevalence of paediatric ENT disorders in military hospitals. This study was aimed to find out the prevalence of paediatric ENT disorders in a peripheral military hospital.

Methods

This was an observational study carried out on 4612 consented child patients between the ages of 0-14 years attending ENT OPD, Combined

Military Hospital (CMH) Momenshahi, Bangladesh. Study period was about 3 years (from 1st April 2017 to 31st March 2020). After taking history routine clinical examinations were carried out. In appropriate cases endoscopic examination of ENT, radiological (X-ray/CT scan) and pathological evaluation were also done. Findings were documented in prescribed form. All patients took consultation from same ENT specialist. Children having known medical or other systemic diseases were excluded from the study. The statistical analysis was done by using IBM SPSS version 25.0. Ethical clearance was also approved by the respective institution.

Results

We dealt with a total of 4612 children irrespective of age and sex. Among them 2406(52.2%) were males and 2206(47.8%) were females with a Male to Female ratio of 1:1.09 (Figure 1). Most of the patients belonged to 6-10 years age group 2050(44.4%) followed by 1553(33.7%) and 1009(21.9%) in 11-14 years and 0-5 years age group respectively (Figure 2). Male preponderance noticed among the 0-5 years and 6-10 years age group but 11-14 years age group showed almost equal sex distribution (Figure 2).

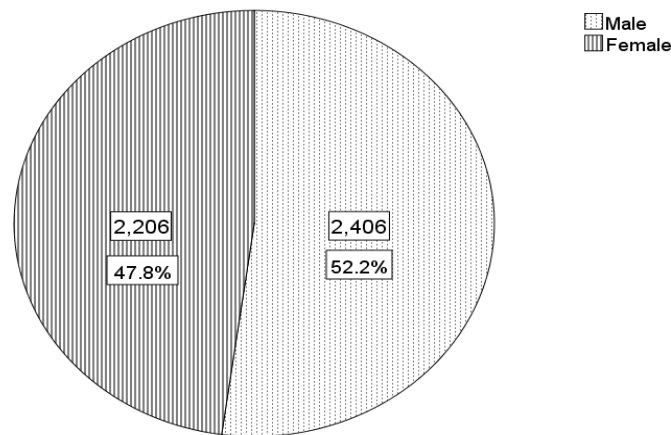


Figure 1: Showing Sex distribution among the children (n=4612)

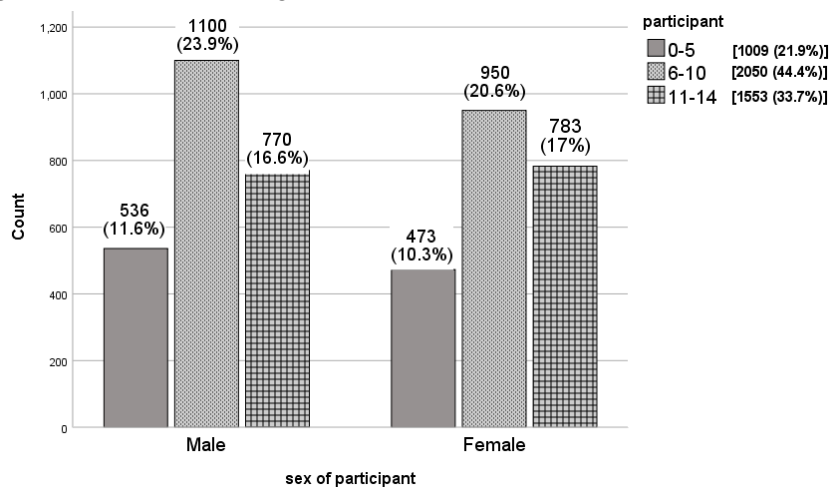


Figure 2: showing Age distribution as per sex of the study populations (n=4612)

Original Contribution

Majority of the children presented with throat related disorder 1875(40.7%) followed by ear disorder 1607(34.8%) and nose disorder 1100 (23.9%) (Table I). But in 0-5 years age group majority of them were related to ear disorders 675 out of 1009(14.6% out of 21.9%) (Table I).

Table I: Distribution of organ involvement as per age among children (n=4612)

Age of participant		Organ involved				Total
		Throat	Ear	Nose	Neck	
0-5	Count	143	675	191	00	1009
	% of Total	3.1	14.6	4.1	0.0	21.9
6-10	Count	973	574	481	22	2050
	% of Total	21.1	12.4	10.4	0.5	44.4
11-14	Count	759	358	428	08	1553
	% of Total	16.5	7.8	9.3	0.2	33.7
Total	Count	1875	1607	1100	30	4612
	% of Total	40.7	34.8	23.9	0.7	100.0

Table II: Disease distribution among the participants (n=4612)

Diseases	Frequency (n)	Percent (%)
Chronic tonsillitis	1004	21.8
Acute otitis media (AOM)	744	16.1
Pharyngitis	453	09.8
Wax	430	09.3
Adenotonsillitis	404	08.8
Acute rhinitis	368	08.0
Allergic/chronic rhinitis	346	07.5
Chronic rhinosinusitis	266	05.8
Otitis externa	167	03.6
Otitis media with effusion (OME)	159	03.4
Epistaxis	57	01.2
Chronic Otitis Media (COM)	46	01.0
FB (Nose/Ear/Throat)	35	00.8
Eustachian Tube Dysfunction	29	00.6
Cervical Lymphadenopathy	21	00.5
Aphthous Ulcer	15	00.3
Keloid Ear Lobule	14	00.3
Traumatic Injury Ear/ Nose	14	00.3
Nasal Vestibulitis	11	00.2
Deviated Nasal Septum (DNS)	10	00.2
Otomycosis	08	00.2
Salivary Gland Infection	05	00.1
Preauricular Sinus	03	00.1
Keratosis Obturans	03	00.1
Total	4612	100.0

Original Contribution

The most common throat disorder in this study was chronic tonsillitis 1004(53.5%) followed by pharyngitis (Acute/Chronic) 449(23.9%) and adenotonsillitis 404(21.5%) shown in Table III.

Table III: Distribution of throat related disorders among children (n=1875)

Throat disease of participants	Frequency (n)	Percent (%)
Chronic tonsillitis	1004	53.5
Pharyngitis	449	23.9
Adenotonsillitis	404	21.5
Aphthous ulcer	15	00.8
FB (Nose/Ear/Throat)	03	00.2
Total	1875	100.0

Both the 6-10 years 472(47.0%) and 11-14 years 478(47.6%) age groups were affected by chronic tonsillitis with a slight male preponderance (M: F = 1.07:1) shown in Table IV.

Table IV: Distribution of chronic tonsillitis among the participants (n=1004)

Sex of participant		Age of participant			Total
		0-5	6-10	11-14	
Male	Count	23	253	244	520
	% of Total	2.3	25.2	24.3	51.8
Female	Count	31	219	234	484
	% of Total	3.1	21.8	23.3	48.2
Total	Count	54	472	478	1004
	% of Total	5.4	47.0	47.6	100.0

Among the ear disorders AOM 744(46.3%) was mostly reported followed by wax 430(26.8%), otitis externa 167(10.4%) and OME 159(9.9%) (Table V). Reported rate of COM was only 46(2.9%) (Table V).

Table V: Distribution of ear related disorders among children (n=1607)

Ear disease of participants	Frequency (n)	Percent (%)
AOM	744	46.3
Wax	430	26.8
Otitis externa	167	10.4
OME	159	09.9
COM	46	02.9
FB (nose/ear/throat)	22	01.4
Keloid era lobule	14	00.9
Traumatic injury ear/ nose	11	00.7
Otomycosis	08	00.5
Preauricular Sinus	03	00.2
Keratosis obturans	03	00.2
Total	1607	100.0

Table VI: Distribution of COM among children (n=46)

Age of participant		Sex of participant		Total
		Male	Female	
0-5	Count	00	01	01
	% of Total	0.0	2.2	2.2
6-10	Count	13	02	15
	% of Total	28.3	4.3	32.6
11-14	Count	13	17	30
	% of Total	28.3	37.0	65.2
Total	Count	26	20	46
	% of Total	56.5	43.5	100.0

Commonest nasal disorder were acute rhinitis 368(33.5%) followed by allergic/chronic rhinitis 346(31.5%) and CRS 266(24.2%) shown in Table VII.

Table VII: Distribution of nasal disorders among children (n =1100)

Nasal disease of participants	Frequency (n)	Percent (%)
Acute rhinitis	368	33.5
Allergic/chronic rhinitis	346	31.5
CRS	266	24.2
Epistaxis	57	05.2
Eustachian tube dysfunction	29	02.6
Nasal vestibulitis	11	01.0
FB (nose/ear/throat)	10	00.9
DNS	10	00.9
Traumatic injury ear/ nose	03	00.3
Total	1100	100.0

Age group of 11-14 years was mostly affected by allergic/chronic rhinitis 185(53.5%) with a small male preponderance (M:F = 1.05) (Table IX) but Acute Rhinitis mostly affected the 0-5 years age group 166(45.1%) with a male to female ratio of 1 : 1.24 (Table VIII).

Table VIII: Distribution of acute rhinitis among the children (n=368)

Age of participants		Sex of participant		Total
		Male	Female	
0-5	Count	92	74	166
	% of Total	25.0	20.1	45.1
6-10	Count	83	54	137
	% of Total	22.6	14.7	37.2
11-14	Count	40	25	65
	% of Total	10.9	6.8	17.7
Total	Count	215	153	368
	% of Total	58.4	41.6	100.0

Table IX: Distribution Allergic/Chronic Rhinitis among children (n=346)

Age of participant		Sex of participant		Total
		Male	Female	
0-5	Count	01	00	01
	% of Total	00.3	00.0	00.3
6-10	Count	125	35	160
	% of Total	36.1	10.1	46.2
11-14	Count	95	90	185
	% of Total	27.5	26.0	53.5
Total	Count	221	125	346
	% of Total	63.9	36.1	100.0

Commonest neck disorder was cervical lymphadenopathy 21(0.5%) (70.0% of all neck disorders) (Table X) which was common in 6-10 years age group. (Table XI).

Table X: Distribution of Neck related disorders among children (n =30)

Neck disease of participants	Frequency (n)	Percent (%)
Cervical lymphadenopathy	21	70.0
Salivary gland infection	05	16.7
Neck pain	04	13.3
Total	30	100.0

Table XI: Distribution of cervical lymphadenopathy among children (n=21)

Age of participant		Sex of participant		Total
		Male	Female	
6-10	Count	01	16	17
	% of Total	4.8	76.2	81.0
11-14	Count	00	04	04
	% of Total	0.0	19.0	19.0
Total	Count	01	20	21
	% of Total	4.8	95.2	100.0

Discussion

Prevalence of ENT disease varies from country to country. Currently few studies are available in Bangladesh regarding prevalence of paediatric ENT diseases among the children of primary schools and tertiary care center^{3,7}. This study endeavored to determine the prevalence of paediatric ENT diseases commonly presented to ENT OPD of a peripheral military hospital (CMH). Amongst a total of 4612 children 52.2% were males and 47.8% were females with a Male to Female ratio of 1: 1.09 (Figure 1). This is similar to almost all the studies done in home and

abroad^{2,3,4,5,7}. We marked male dominance among 0-5 year's age group (M - 11.6% and F- 10.3%) and 6-10 years age group (M - 23.9% and F- 20.6%) but in 11-14 years age group sex distribution is almost equal (M - 16.6% and F- 17%) shown in Figure 2. Though this distribution was insignificant, yet a similar report was found in a study by Surapaneni⁸. Most of the patients belonged to 6-10 years age group (44.4%) followed by (33.7%) in 11-14 years and (21.9%) in age group of 0-5 years (Figure 2). This finding commensurate with other studies in abroad^{4,9,10} but a Nigerian study publicized mostly affected age

group was 0-5 years (67.33%) whereas the 11-15 years age group were the least involved (11.16%)⁵. During reflection of organ specific disorder majority of the disorder were related to throat (40.7%) followed by ear (34.8%), nose 1088(23.9%) and Neck (0.7%) (Table I). This finding also slightly differ from various studies in home and abroad who showed ear disorder as their most commonly affected organ^{2,3,5,7,9,10,11,12,13}. But in 0-5 years age group we noticed majority of them were related to ear disorders (14.6% out of 21.9%) (Table I). While considering overall ENT diseases the most common ENT disorder was chronic tonsillitis (21.8%) followed by acute otitis media (16.1%) and pharyngitis (9.8%). This findings were slightly different from most of the studies done in home and abroad where they showed Otitis media (Acute/Chronic) as their most common ENT disorder^{3,8,9,12,14}. Poverty is considered as a major risk factor of CSOM in developing countries and has been found to be predominant in the lower socioeconomic class group^{15,16}. This factor also implies to our country but military personnel in our country lead a relatively better socioeconomic status. So this might be a factor for slightly dissimilar findings in this study. If we consider only throat related disorder, chronic tonsillitis (53.5%) was the most common in this study population followed by pharyngitis (acute/chronic) (23.9%) and adenotonsillitis (21.5%). Both 6-10 years (47.0%) and 11-14 years (47.6%) age group were mostly affected by chronic tonsillitis with a slight male preponderance (M:F = 1.07). This finding is similar to other studies where Surapaneni and Sisodia⁸, Raza Khan¹⁷ and Rajendra Nepali and Sigdel² showed incidences of chronic tonsillitis as 33.3%, 37% and 36.7% respectively. We showed prevalence of Pharyngitis was (9.8%) but a higher rate were found by Yeli¹⁸ (28.3%) and R Nepali & Sigdel¹⁹ (44.8%). In this study most common ear disorder was AOM (46.3%) as children are more susceptible to developed AOM due to Eustachian tube anatomy³. But this study is not in par with other studies because some researchers included both AOM and COM together whereas other researchers did not consider AOM separately. In UAE, a hospital based study reported 42.9% AOM as their most common ear disease¹⁸. Most researchers found COM as their commonest ear disease. We observed a lower number of COM (2.9% among the ear disorders) and (1% of all

disorders), that mostly affected 11-14 years age group (65.2%) with a male to female ratio of 1.30:1. This finding differs from the results of other researchers in home and abroad where Sigdel and Nepali⁴, Reza Khan et al.¹⁷, Matilda Ujulbekwe & Ogechi Chibuzor Mbalaso⁵ and Thakur et al.²¹ (The study was only on ear diseases) showed a COM prevalence of 24.3%, 14.0%, 12.1% and 42.64% respectively. A higher rate of COM were found in studies by Kishve et al.¹², Surapaneni and Sisodia⁸ and Khanam et al.³ who represented their prevalence as 31.8% , 27.1% and 24.8% respectively. Although all of them included both AOM and COM as Otitis media. Middle ear infection resulting in hearing loss, both in children and adults, is a major health problem in developing countries, more common in South Asia. Poverty, illiteracy, lack of awareness and lack of medical facility are important causes for high prevalence of resulting hearing loss^{6,16,22}. ENT treatment facilities are not available in most of the rural areas and also many urban areas of Bangladesh are not adequately provided with health facilities. In developing countries, most of the patient received inadequate treatment of COM due to ignorance of patient parties, poor socioeconomic factors, lack of access to adequate health care facilities including early ENT specialist consultation and the emergence of antibiotic resistance due to indiscriminate sale of systemic antibiotics by quack & unqualified local pharmacy sellers. As it's already mention earlier that the military personnel maintain a good socioeconomic living in comparison to overall low and low middle class population of Bangladesh. Moreover all military hospitals in Bangladesh are equipped with adequate ENT treatment facilities; where rapid, easy and free access to these facilities is ensured. So every child patient received early treatment from ENT specialists. This treatment facility ultimately cures AOM at its early stage and stops progression to COM or OME and other fatal complications. For this reason we also observed low prevalence of Otitis Media with Effusion (9.9% among all ear disorders) in this study. Ear wax (26.8%) was reported as the second most common ear disorder in this study which differs from other studies by Rajendra Nepali & Sigdel² and Zeeshan et al.¹³ who showed ear wax as their most common ear disorder with the prevalence of 33.4% and 15.2% respectively. In Bangladesh 9.6% of population are suffering

from various degree of deafness. Among them 12.0% cause is due to ear wax²³. We noticed a good number of otitis externa 10.4% among ear disorders and 3.7% in overall diseases in this study. Ear lobule keloid was found in (0.3%) which occurs mainly due to unhygienic ear piercing in beauty shops. In this study the most common nasal disorder was acute rhinitis (33.5%) which was mainly viral in origin with coexisting features of upper respiratory tract infection. In 0-5 years age group (45.1%) was mainly affected with overall male predominance (58.4%). This observation showed similarities with the findings of Raju and Fareeduddin (10.56%)⁹, Surapaneni and Sisodia 12.5%⁸, Khanom et al. (6.97%)³ and Nepali and Sigdel (23.4%)². Rhinitis was shown as the most common ENT disorder with a much higher rate by Suman Siddalingappayeli (47.6%)¹¹ and Kishve et al. (38.2%)¹². Their prevalence was high as both of them included acute, chronic and allergic rhinitis together. Next common nasal disorder in this observation was allergic/chronic rhinitis (31.5%) which mostly affected 11-14 years group (53.5%) with a male to female ratio of 1:1.05. Air pollution and climate change have a significant impact on human health and well-being and contribute to the onset and aggravation of allergic rhinitis and asthma among other chronic respiratory diseases²⁴. The ISAAC protocol study in the schools of Dhaka confirmed that the problem of asthma and other atopic conditions are very large in child population of our country. The prevalence of allergic rhinitis was 20.0%²⁵. Male children were found to be more suffering from all types allergic conditions than their female peers. Allergic rhinitis was the commonest of all atopic problems in children mainly affecting older group of children (13-14 years). Similar findings were shown by Raju and Fareed Uddin (6.16%)⁹. But a higher rate were observed by Pherwani A (11.3%)²⁶ and Nepali and Sigdel (14.5%)². The high prevalence of Rhinitis due to repeated upper respiratory tract infection, allergic rhinitis, obstructive hypertrophy of the tonsils and adenoids with poor patient compliance are the most common contributing factors for developing CRS. The prevalence of CRS in this study was 6.0% among overall diseases and 24.2% among nasal disorders. It commensurate with the findings of Raju and Fareed Uddin (6.5%)⁹, Khanam et al. (5.34%)³ and but differs with the findings of Surapaneni and Sisodia (15.6%)⁸. Epistaxis in

children is a common disorder usually due to local irritation in Kiesselbach's plexus which mostly occurs following local trauma inflammation and infections. Most often bleeding is self-limiting in children. Prevalence of epistaxis was (1.2%) in this observation. This observation is almost similar with the study by Raju and Fareeduddin⁹ (2.31%) but differs with the studies by Sanjay P. Kishve¹² 16.6%, Nepali and Sigdel² (13.5%), Khanam et al.³ (4.65%), Yeli²⁷ 15.0%, Surapaneni and Sisodia⁸ was 8.5%. Presence of FB in ear nose and throat were found were (0.8%). Most of them were FB Ear. Common FB were inanimate objects like plastic beads, cotton buds and fish bones. Khanam et al.³ showed similarity with this study (1.39%). Among the neck disorders majority of them were cervical lymphadenopathy (70.0%). Cervical lymphadenopathy was common in the 6-10 age groups (81.0%) where most of them were due to nonspecific infective lymphadenitis. The observations of this study mirrored almost similar findings between the prevalence of paediatric ENT diseases in military hospitals and non-military hospitals of Bangladesh except in few cases. Due to relatively better socio-economical factors and early access to ENT consultation; Bangladeshi military hospitals considerably reduced the rate of COM and its long term morbidities among paediatric populations of military families.

Conclusion

During the study period we perceived that tonsillitis, acute otitis media, pharyngitis and ear wax are the most prevalent ENT disorder among paediatric study population presenting to ENT OPD. Prevalence of paediatric ENT disorders may differ from country to country due to various social and environment factors. To our observation it is noticeable that in addition to improved health education, socioeconomic status and better access to health care facilities; provision of early ENT specialist consultation may significantly reduce chronic or recurring symptoms and long term morbidities of common ENT disorders in children specially hearing loss due to COM. So this is highly recommended that health care policy makers of our country should take necessary measures to provide the provision of ENT specialist consultation to all the peripheral hospitals.

Limitations of the study

This study was conducted only in one military Hospital and we did not consider any control group as such an exact comparison with military and nonmilitary patients could not be brought about. Thus our finding did not portray the overall prevalence of our country in general. Another limitation was that we tried to highlight the most important paediatric ENT disease prevalence. So the scope of further study remains to bring about the real picture of our country.

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