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Original Research Article

Effects of COVID-19 on Otitis Media with Effusion in a Tertiary Care Hospital

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Abstract: ***Background:*** Otitis media with effusion (OME), sometimes referred to as secretory or severe otitis media, is among the most common conditions in children. An estimated 80% of all children have had at least 1 episode of OME by the age of 10 years, with a peak of prevalence in the first 2 years of life. ***Objectives:*** The aim of the study was to evaluate the effects of COVID-19 on otitis media with effusion in a tertiary care hospital. ***Methods:*** This cross-section observational study Rangpur Medical College & Hospital Rangpur, Bangladesh. The duration of the period from July 2021 to July 2022. A total of 80 children, Age <6 months or >12 years with Otomicroscopic evidence of tympanosclerosis, choesteatoma, eardrum perforation, or complete stenosis or atresia of the external auditory canal were included in the study. Severely ill children and not willing to participate were excluded. After collection, the data were checked and cleaned, followed by editing, compiling, coding and categorizing according to the objectives and variable to detect errors and to maintain consistency, relevancy and quality control. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS- 24). ***Results:*** Before pandemic 9.52% of the respondents had <3 years of age, 23.80% were 3-7 years, 57.14% were 7-10 years and 10% had 10-12 years of age. During pandemic 11.42% of the respondents had <3 years of age, 19.04% were 3-7 years, 61.90% were 7-10 years and 7.62% had 10-12 years of age. No significant difference in mean age before and during pandemic. Before pandemic 65% of the respondents were male and 35% were female. During pandemic 40% of the respondents were male and 60% were female. Before pandemic 28.57% respondents were underweight, 57.14% were in normal range and 14.28% were overweight. During pandemic 26.67% were underweight, 55.23% were in normal range and 18% were overweight. The prevalence of OME was 40.6% before pandemic and 2.3% during pandemic. Children with chronic OME had a higher rate of disease resolution during pandemic (95%) than those examined before pandemic (5%, P \.001). ***Conclusion:*** The findings of our study, in our opinion, have important clinical implications, implying that keeping children at home for as little as 2 months may allow for the resolution of most cases with severe and refractory OME. This method, while possibly advantageous for all age groups, should be given special consideration for young children, who are the most susceptible to otitis.

Keywords: Otitis Media, Effusion, COVID-19.

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INTRODUCTION

Otitis media with effusion (OME), sometimes referred to as secretory or severe otitis media, is among the most common conditions in children. An estimated 80% of all children have had at least 1 episode of OME by the age of 10 years, with a peak of prevalence in the first 2 years of life [1]. It is characterized by the presence of fluid behind an intact tympanic membrane, without signs and symptoms of acute infection, and it is defined as chronic when the middle ear effusion persists for >3 months [1, 2]. OME is often a self-limiting illness, but in about one-third and one-quarter of affected children, it can also be chronic and recurrent [2]. Chronic OME can result in middle ear issues and conductive hearing loss, which can cause behavioral and speech issues as well as poor academic performance [2, 3]. It is the most prevalent cause of childhood hearing impairment in the developed world, which has a detrimental effect on quality of life [4]. The eustachian tube's anatomical and functional immaturity the increased incidence of upper respiratory tract infections (URTIs) brought on by contact with viruses and bacteria in daycare facilities [2, 5] and the frequent hypertrophy of the adenoid tissue have all been linked to the high prevalence of OME in young children [6]. Verification of the effect of day care and school absences on the prevalence of OME has been made possible by the mandatory home isolation of children during the current SARS-CoV-2 pandemic (severe acute respiratory syndrome coronavirus 2. Thus the of the study was to evaluate the effects of COVID-19 on otitis media with effusion in a tertiary care hospital.

METHODOLOGY

This cross-section observational study Rangpur Medical College & Hospital Rangpur, Bangladesh. The duration of the period from July 2021 to July 2022. A total of 80 children, Age <6 months or >12 years with Otomicroscopic evidence of tympanosclerosis, choesteatoma, eardrum perforation, or complete stenosis or atresia of the external auditory canal were included in the study. Severely ill children and not willing to participate were excluded. If all three of the following conditions were met, OME was officially diagnosed: mild to severe conductive hearing loss; type B tympanogram (flat); otomicroscopic evidence of middle ear effusion, indicated by a yellowish retracted tympanic membrane and by air-fluid level or bubbles in the middle ear. Type A: normal compliance and middle ear pressure.Type B: low compliance with no discernible peak. Type C: normal compliance with negative middle ear pressure, often associated with a retracted tympanic membrane due to eustachian tube dysfunction and divided into 2 subtypes [7]: (type C1) if pressure is from 2100 to 2199 mm H2O and (type C2) if pressure is from 2200 to 2400 mm H2O

Using a typical 226 Hz probing tone. Face to face interview was done to collect data with a semi-structured questionnaire. After collection, the data were checked and cleaned, followed by editing, compiling, coding and categorizing according to the objectives and variable to detect errors and to maintain consistency, relevancy and quality control. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS- 24).

RESULT

Table-1: Distribution of the respondents by age group (N=80)

Age group	Before Pandemic		During pandemic		P value
	N=40	%	N=40	%	
<3 years	4	9.52	4	11.42	0.50
3-7 years	9	23.80	8	19.04	
7-10 years	23	57.14	25	61.90	
10-12 years	4	9.52	3	7.62	
Mean ± SD	8± 0.9		7± 0.3		

Before pandemic 9.52% of the respondents had <3 years of age, 23.80% were 3-7 years, 57.14% were 7-10 years and 10% had 10-12 years of age.

During pandemic 11.42% of the respondents had <3 years of age, 19.04% were 3-7 years, 61.90% were 7-10 years and 7.62% had 10-12 years of age. No significant difference in mean age before and during pandemic.

Before pandemic 65% of the respondents were male and 35% were female.

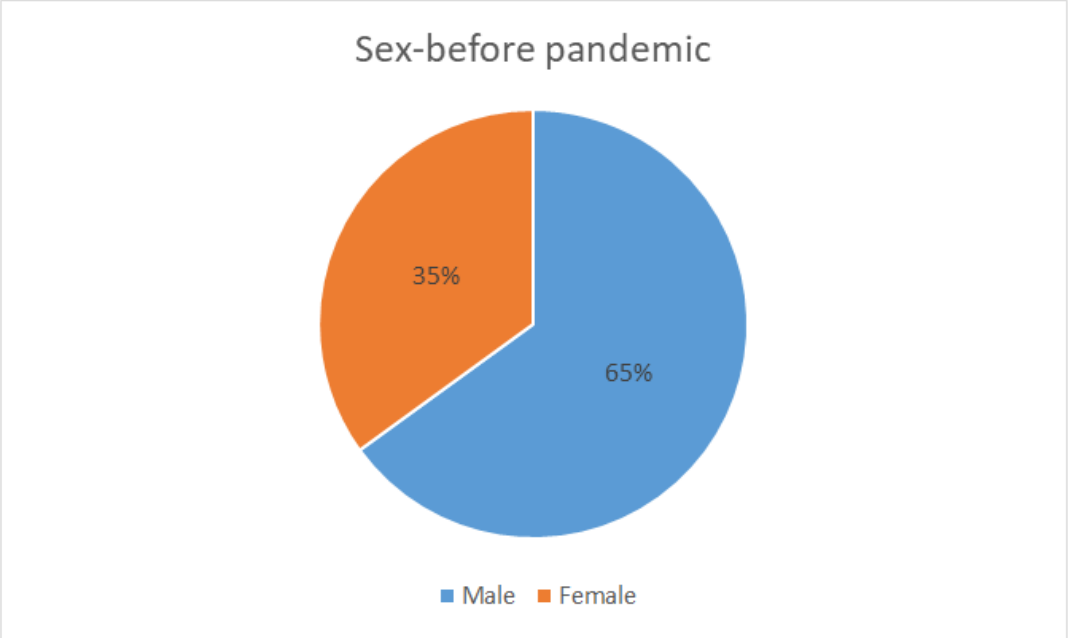

Figure-1: Distribution of the respondents by sex before pandemic

During pandemic 40% of the respondents were male and 60% were female.

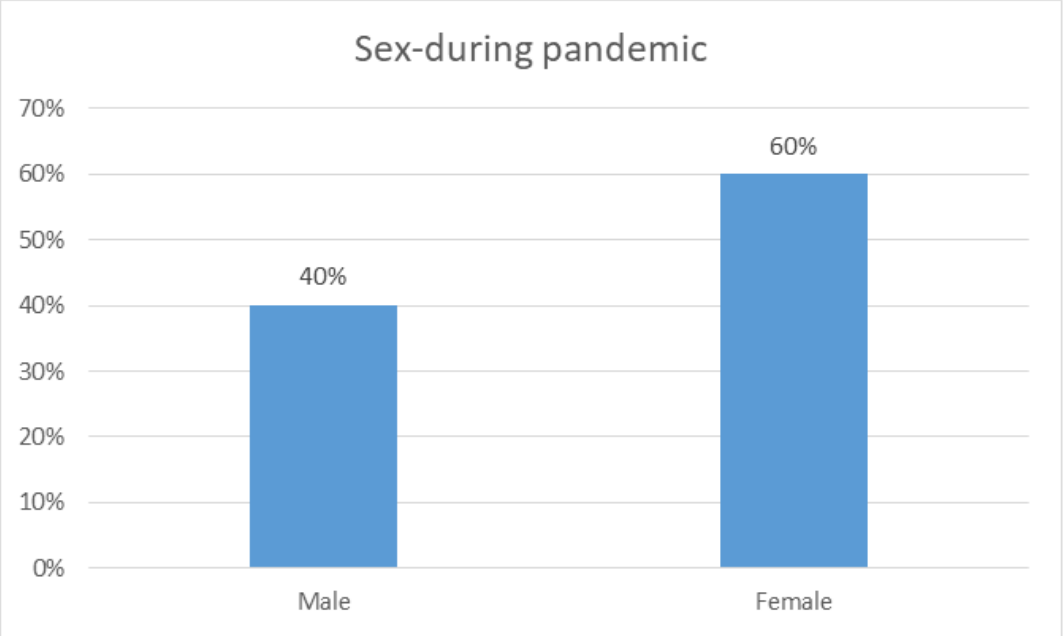

Figure-2:

Table-2: Distribution of the respondents by BMI (N=80)

BMI (kg/m²)	Before COVID-19 pandemic		During COVID-19 pandemic		P value
	N=40	%	N=40	%	
Underweight	11	28.57	10	26.67	
Normal range	23	57.14	22	55.23	0.005*
Overweight	6	14.28	8	18.0	

Before pandemic 28.57% respondents were underweight, 57.14% were in normal range and 14.28% were overweight. During pandemic 26.67% were underweight, 55.23% were in normal range and 18% were overweight.

Table-3: Distribution of the respondents by Tympanogram

Tympanogram	Before COVID-19 pandemic		During COVID-19 pandemic	
	N=40	%	N=40	%
A	18	44.9	38	94.4
B	17	40.6	1	2.3
C1	3	8.9	1.12	2.8
C2	2	5.7	0.2	0.5

The prevalence of type B tympanograms was 40.6% before the pandemic period; dropped to 2.3% during pandemic period.

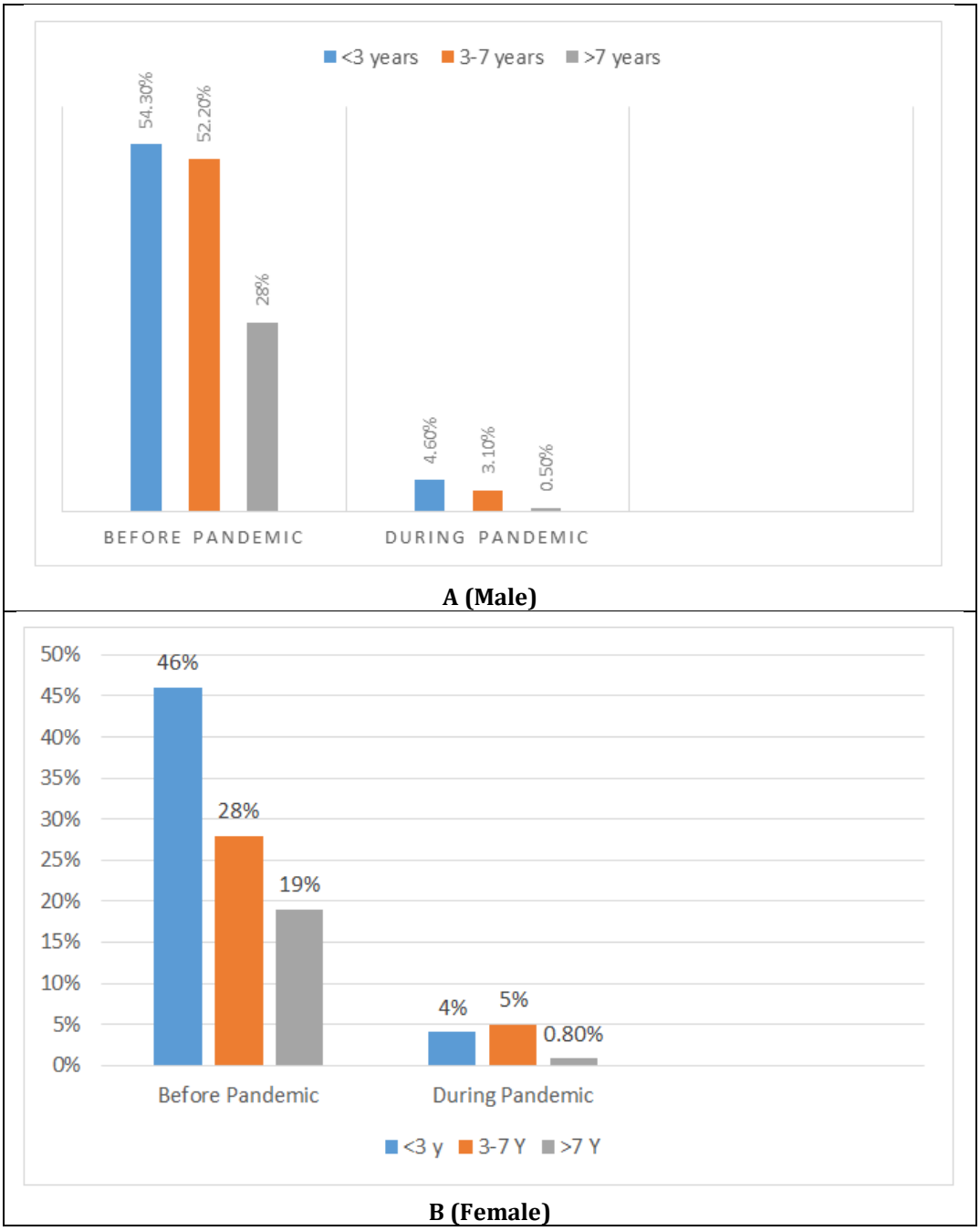

Figure-3: Prevalence of type B tympanograms by age between (A) males and (B) females, comparing before and during pandemic

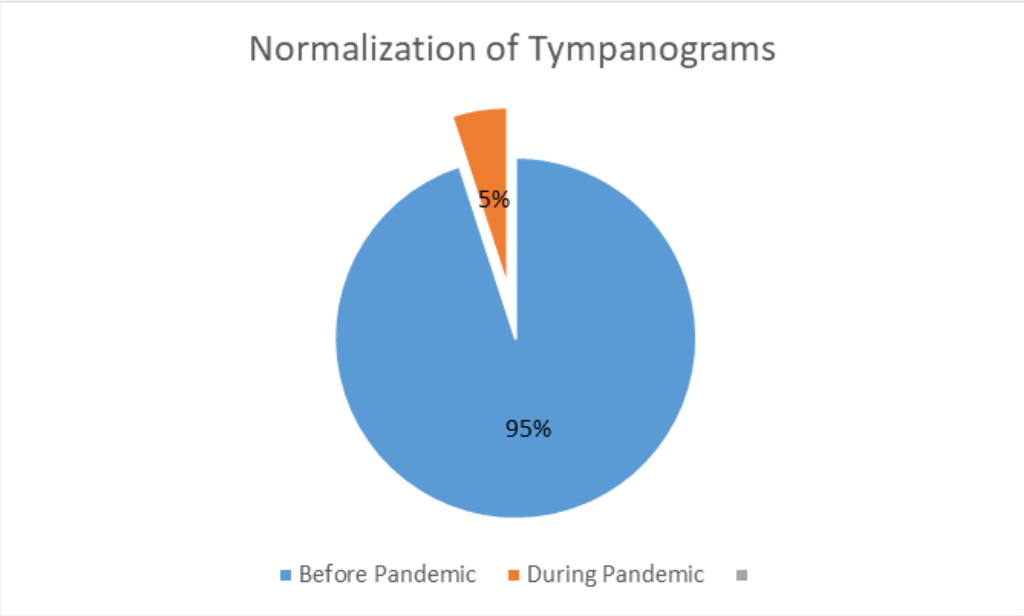

Figure-4: Figure shows Normalization of Tympanograms

Children with chronic OME had a higher rate of disease resolution during pandemic (95%) than those examined before pandemic (5%, P \.001).

DISCUSSION

A nationwide lockdown was imposed by the BD government from March, 2020, to contain the COVID-19 outbreak. All schools and day care centres were closed. The prevalence of OME in children referred to our outpatient audiology clinic during was higher than what has been previously reported in the literature [2, 7]. Seasonal fluctuations in the prevalence of OME, with a winter peak associated with an increased incidence of URTIs [8-10]. We also found that males had a higher prevalence of OME in each age group and over both periods of surveillance [11]. The reasons for this sex difference are unknown, but probable hypotheses include genetic factors that influence sensitivity to OME [12] poor pneumatization of the mastoid process [13] and different effects of sex hormones on Th1/Th2 cytokine balance (T helpers 1 and 2) [14]. In our study Audiologic examinations performed following the severe 2-month lockdown imposed because to COVID-19 revealed a significant decrease in the occurrence of OME. Here, The prevalence of type B tympanograms was 40.6% before the pandemic period; dropped to 2.3% during pandemic period. There could also be disagreements over the definition and diagnostic criteria for OME. Although tympanometry is thought to be a very reliable tool for detecting OME, some false positives are possible [15]. Obligated avoidance of interpersonal contacts and strict adherence to hygienic-behavioral standards appear to have considerably contributed to the containment of not just COVID-19 but also all other infectious disorders that underpin the development or persistence of OME, such as URTIs [16-19].

Children who attend day care centres are more likely to be exposed to resistant microbes, whose transmission and aggression are aided by high class sizes, increased peer-to-peer intimate contact, and indiscriminate antibiotic usage [20, 21] Furthermore, psychological stress in sick children who visit day care centres raises cortisol levels, especially in children 36 months old, altering the immunological response and increasing the risk of OME [22, 23].

CONCLUSION

The findings of our study, in our opinion, have important clinical implications, implying that keeping children at home for as little as 2 months may allow for the resolution of most cases with severe and refractory OME. This method, while possibly advantageous for all age groups, should be given special consideration for young children, who are the most susceptible to otitis.

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