Risk Factors of Otitis Media in Children, Asser region: A Case-Control Study

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ABSTRACT

Background: Otitis media with effusion is a global problem. Otitis media, or middle ear inflammation, is a common pediatric condition that can result in hearing loss and delayed speech. Otitis media affects almost two-thirds of all children According to various research, it affects between 15% and 40% of the population. 1According to the World Health Organization, otitis media causes hearing loss in approximately 42 million children's over the age of three. Before entering the school system, over 90% of youngsters suffer from this disease.

Method: After collection of data, data was coded and entered in the SPSS ver.20 software for analyses descriptive statistics (mean standard deviation, frequencies and percentages were computed), to measure the significance differences chi-square test was used at 5% level of significance, regression analysis was also carried out to determine the significant risk factors. In this cross - sectional study data was collected by the purposely constructed questionnaire. Questionnaire composed of the demographic items and items related to the OM diseases. Questionnaire was constructed after the series of discussions between the panel of experts this panel composed of from subject specialist, researcher, and language expert. Cronbach alpha of the questionnaire was calculated.

Results: Two hundred five patients have bilateral OME, and only 14 patients have unilateral OME. (Figure 2). All patients were assessed for eligibility for tympanostomy tube placement (myringotomy), of which 167 (76.3%) patients were eligible for bilateral grommets and 52 (23.7%) for unilateral tube placement. (Figure 3) The prevalence rate of OME in our study was 38.3% (219/572). The age ranged from 2 to 12 years (mean (SD) = 8.5± 12.8 years).

Conclusion: In conclusion we have observed that OME is a threat of our young youth and children, we have to do some relevant actions to overcome and to reduce the prevalence of OM diseases

Keywords: Risk, Otitis Media, Diseases, Ear diseases

BACKGROUND

Otitis media with effusion (OME) is a worldwide issue. middle ear inflammation, is a common pediatric condition that can result in hearing loss, delayed speech and difficulty in school learning. Otitis media affects almost two-thirds of all children According to various research, it affects between 15% and 40% of the population[1,2]. According to the World Health Organization, otitis media causes hearing loss in approximately 42 million persons over the age of three. Before entering the school system, over 90% of youngsters suffer from otitis media. Many cases of otitis media resolve spontaneously within three months, but recurrence occurin about 30% to 40% of youngsters[3]. Otitis media is may be due to bacterial, fungal, or viral infection, Tumors, big adenoid, inflammations, and sinusitis all lead toEustachian tube obstruction and can middle ear inflammation. Middle ear infections are aggravated by a combination of cultural, socioeconomic, and environmental factors (e.g., living in crowded places, living in large families, breastfeeding duration, smoking status), genetic (e.g., craniofacial anomalies such as Down syndrome and cleft palate), nutritional, and medical factors[4-9].

Age, daily routine and children who are not breastfed, Tobacco smoke is a harmful substance. About 80% of all children will develop otitis media at some point in their lives, and between 80% and 90% of all children will develop otitis media with effusion before reaching school age[10-12]. According to one study done in Saudi Arabia the prevalence of OME in school students in the Qassim region is at 7.5 percent[13]. In the Qassim region, age less than eight years, family size greater than four

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members, mother education less than secondary school, residing in a rural environment, and recurrent AOM are all proven to be predictors of OME[14]. To the best of our knowledge no more studies are conducted in Asser region of the Saudi Arabia regarding risk factors associated with OME, so the aim of this study is to assess the Risk Factors of Otitis Media with effusion in Children in Asser region.

METHOD

In this cross-sectional study data was collected by the purposely constructed questionnaire. Questionnaire composed of the demographic items and items related to the OME. Cronbach alpha of the questionnaire was calculated to measure the internal consistency of the questionnaire. Study conducted in hospitals in Asser region of Saudi Arabia. The questionnaire consists of three sections consisting of demographic information, audiology results, and otitis media risk factors. Based on previous studies, the following risk factors were extracted and studied: age, gender, working mother, education, large family, smoking, using pacifiers or bottle feeding, rhinorrhea, snoring, allergic rhinitis, seasonal rhinitis, tonsillopharyngitis, and adenoid hypertrophy. Sample size was 650 patients; age ranged from two to twelve years referred to otolaryngology clinics in Asser central hospital and Khamis hospitals.

Study duration was Feb-2021 to June-2021 and approved by research ethical committee of the college of Medicine, King Khalid University. After collection of data, data was coded and entered in the SPSS ver.20 software for analyses descriptive statistics (mean standard deviation, frequencies and percentages were computed), to measure the significance differences chi-square test was used at 5% level of significance, regression analysis was also carried out to determine the significant risk factors.

RESULTS

Out of 650 forms distributed we have received 572 fully filled forms in return (88%, response rate), Cronbach alpha of the questionnaire was 0.789, 311 were males (54.4%) while 261 were females 45.6%). A total number of 219 (38.3%) children have OME, including 122 males (55.7%) while rest was females. (Figure 1).

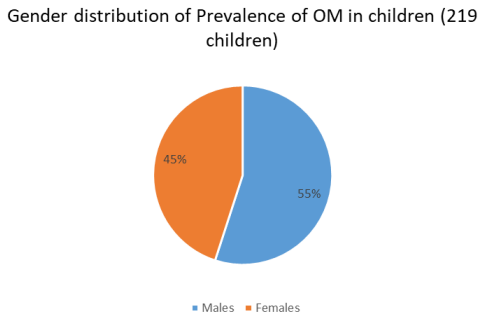

Figure 1: Gender distribution of Prevalence of OM in children

Two hundred five patients have bilateral OME, and only 14 patients have unilateral OME (Figure 2). All patients were assessed for eligibility for myrigotomy, of which 167 (76.3%) patients were eligible for bilateral myringotomy and 52 (23.7%) for unilateral myringotomy. (Figure 3) The prevalence rate of OME in our study was 38.3% (219/572). The age ranged from 2 to 12 years (mean (SD) = 8.5± 12.8 years). Children with recurrent OME were 74 cases including 39 males and 35 females, with no statistically significant difference between both sexes. (Table 1).

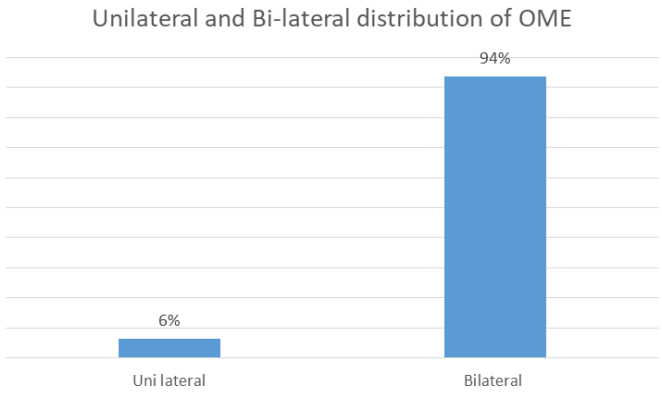

Figure 2: Unilateral and Bi-lateral distribution of OME

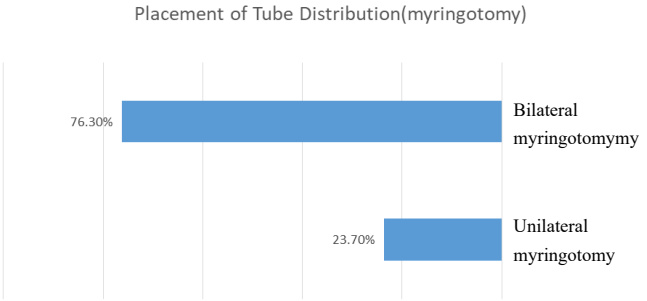

Figure 3: Myringotomy distribution

Table 1: Gender wise comparisons between Recurrent and non-recurrent OME

Gender wise comparisons between Recurrent and non-recurrent OME				
p-value	Female	Male		
N.S	35	39	74	Recurrent OME
	136	83	145	Non Recurrent OME

Table 2 compared the related characteristics in different age groups of children with recurrent OME. Tonsil hypertrophy ($P < 0.01$), Adenoid hypertrophy ($P < 0.01$), and recurrent URTIs ($P < 0.01$) and ear diseases ($P < 0.01$) were significantly higher in the lower age group (<6 years), with no significant differences in other factors, e.g., family history of atopy and passive smoking.

Table 2: Age and Risk Factors

p-value	From 6-12 years	Less than 6 years	Risk Factors
0.0001	4	9	Allergic rhinitis
0.001	2	6	Adenoid hypertrophy
0.001	3	6	Tonsil hypertrophy
0.001	3	7	Gastroesophageal reflux
0.001	4	2	Recurrent upper respiratory tract infection
0.0001	2	6	Sinusitis
0.49	1	1	Passive smoking history
0.89	2	4	Family history of atopy
0.0001	6	6	Family history of ear diseases

The multi-factor logistic regression analysis of the factors connected to recurrent OME was shown in Table 3. Tonsil hypertrophy (P < 0.05,), Adenoid hypertrophy (P << 0.05) sinusitis (P << 0.05),), allergic rhinitis (P << 0.05), posterior nostril polyps (P < 0.05) recurrent URTIs (< 0.05) and gastroesophageal reflux (P < 0.05); have significant effects on the recurrence of OME. Furthermore, being younger is one of the risk factors for recurrence of OME. Family history of atopy (P =N.S), passive smoking history (P =N.S), gender (P =N.S), family history of ear disease (P =N.S), have no significant effect on, the recurrence of OME. Children with never breast-feeding status were at the higher risks of OM (P<0.0001)

Table 3: Logistics regression for Risk Factors of OM

Logistics regression for Risk Factors of OM				
P –values	C.I	O.R	ß	Risk Factors
				Age
P<0.05	0.16-0.84	0.35	0.55	Less than 6 years
P<0.05	0.45-2.74	1.74	0.18	6-12 years
N.S	0.48-1.89	1.01	0.74	Gender
P<0.05	7.3-25.8	13.25	2.54	Allergic rhinitis
P<0.05	8.9-39.9	15.28	2.21	Adenoid hypertrophy
P<0.05	9.8-43.2	7.48	2.68	Tonsil hypertrophy
P<0.05	2.5-14.2	3.15	1.04	Gastroesophageal reflux
P<0.05	6.5-33.2	7.18	1.21	Recurrent upper respiratory tract infection
P<0.05	9.5-48.6	10.65	1.11	Sinusitis
N.S	0.25-6.8	1.48	0.16	Passive smoking history
N.S	0.7-3.2	0.79	0.21	Family history of atopy
N.S	0.8-2.0	1.48	0.48	Family history of ear diseases
P<0.001	2.4-6.3	2.78	1.05	Breast Feeding never
N.S	0.45-8.9	6.5	0.58	Breast Feeding 6-12

DISCUSSION

The overall prevalence of OME was 38.3% percent in our study. There is also a lot of heterogeneity in the prevalence of OME in different studies around the world. Turkey had 16 percent, Italy had 6.8 percent, the Netherlands had 9.5 percent, and Greece had 6.5 percent. The type of people investigated, the geographical area, and the climate appear to have an impact on OME. So in our study we have observed higher rate of OME as compared to other studies which may be due to the geographical, seasons and habitual/behavioral factors of the peoples here in Asser region[15,16].

In children, the etiopathogenesis of OME is still partially understood. OME appears to be a multifactorial condition that can be caused by a variety of causes: including adenotonsilitis, sinusitis, adenoid hypertrophy, tonsils enlargement , Eustachian tube dysfunction, tumors, recurrent otitis media and tissue hyperplasia. OME developed and persisted as a result of the interaction of these risk factors with mucosal hyperplasia and mucus overproduction. However, the precise etiopathogenesis of OME appears to be more difficult and requires further investigation. Young children are more likely to have OME[17,18].

In our research, there was no significant difference in the prevalence of OM between males and females. Our findings are comparable to those of Kiris et al. Neither male nor female gender was found to be a substantial predictor of OME in school children in this investigations[19].

Children's who have never provided breastfeeding are at higher risk of OM which is comparable with the findings of Abraham et al. Atopic illnesses may play a role in the etiopathogenesis of OME in children, according to previous research. According to researchers, the prevalence of allergic rhinitis was significantly greater in patients with OME when compared to other atopic illnesses, which we have also observed in the findings of the current study[20].

One of the previously identified risk factors of OME is exposure of children with OME to passive smoking at home. Our patients' rates of passive smoking were unpredictably low. We were unable to detect a significant link between OME and passive smoking exposure in our research. Martines et al. have previously reported similar findings[20].

Some of the risk factors reported and statistically significant risk factors in our study are postnasal discharge and snoring. Kiris et al. also found a link between these two symptoms and OME risk variables[19].

The fact that we relied on the parents' self-reports was one of our study's limitations. It's possible that this is a source of recollection bias. Most questionnaire items employed 'yes or no' answers for brevity, which may not have allowed parents to offer their specific reaction.

CONCLUSION

In conclusion we have observed that OME is a threat of our young youth and children, we have to do some relevant actions to overcome and to reduce the prevalence of OM diseases. Government should take some more serious steps to avoid it and started the awareness campaigns in schools and colleges to reduce the prevalence of OM and doctors and medical professional should opt the modern technologies to screen out the OM.

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Competing Interest: None

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