

Prevalence and Risk Factors Associated With Otitis Media with Effusion in Children Visiting Tertiary Care Centre in Malaysia

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ABSTRACT

Introduction: The aim of this study is to determine the prevalence of otitis media with effusion (OME) in Malaysian children between three months to twelve years of age and to identify the risk factors associated with it. **Materials and methods:** This is a cross-sectional study consists of 153 children selected by stratified random sampling method. Parents of these children were interviewed with a structured questionnaire. Clinical examination, including otoscopic examination and tympanometry was performed for each child. **Results:** The prevalence of OME was 18.3%. There was no statistical significant relationship between OME and gender, race, household size, attendance to daycare center, breast feeding, and exposure to passive smoking, allergy, and asthma. **Conclusion:** The prevalence of OME is 18.3% in Malaysian children between three months to twelve years of age. Frequency of AOM is a statistically significant factor to the development of OME later in life. The different risk factors associated with OME are still controversial.

KEYWORDS: Otitis media with effusion; risk factors; prevalence

INTRODUCTION

Otitis media with effusion (OME) is a middle ear disease characterized by presence of mucoid effusion in the middle ear without any signs of acute infection.¹

This is a common clinical entity among the children. Since the disease is benign with an insidious onset, the diagnosis is usually delayed. The presence of fluid in the middle ear results in the impaired mobility of tympanic membrane and a conductive type of hearing loss. The complications and sequels of OME are an important public health problem. The patients will have impaired development of speech and language, poor school performance, tympanosclerosis, retraction pockets and psychosocial problems.^{2, 3, 4}

The pathogenesis of otitis media with effusion is still controversial. The causes such as Eustachian tube dysfunction, insufficient pneumatization of mastoid, craniofacial abnormalities, infections, immunodeficiency, and allergic agents are widely discussed. Various risk factors are implicated such as sex, race, premature delivery, passive smoking, allergy, asthma, family size, bottle feeding, socioeconomic status, cleft palate, adenoid hypertrophy, have been studied and are still controversial.¹⁻⁴

Although many studies on the prevalence and risk factors of OME have been done in the west, there are very few Malaysian studies. The risk factors in different studies have remained controversial. The aim of the study was to find the prevalence of OME and its associated risk factors in Malaysian children visiting tertiary care center and to identify the risk factors associated with OME.

MATERIAL AND METHOD

This is a cross-sectional study done in Klang Valley. The study population consists of children between three months to 12 years old who visited our tertiary medical care center for non otological problem such as in pediatric clinic or were accompanying parents visiting the hospitals. Children were randomly selected. Informed consent was obtained from the parents who agreed to be interviewed and have their children examined.

The structured questionnaire consists of two parts. The first part was to identify the risk factors associated with OME, and the second part was to determine the incidence of AOM and its relationship with OME. The risk factors as in Table I were assessed. For the incidence of AOM and its relationship to OME the questions in Table II were asked.

Otosopic examination and tympanometry were performed. The otoscopic finding was labeled as normal, evidence of scarring/thin ear drum, retracted ear drum or glue ear. The tympanometry was done using portable tympanometry. It was regarded as normal, type B and type C. In this study, we categorized the presence of abnormal otoscopic finding; type B tympanogram or both as OME.

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Table I: Risk factors of OME

Age
Single or both parents
No of siblings
Sex
Race
Daycare attendance
Breastfeeding
Exposed to passive smoking
Allergy
Asthma

The diagnosis of previous AOM was applied if the child had been diagnosed previously by medical personnels; or presence of previous history of painful purulent otorrhea. The various risk factor assessments were done using the SPSS 13 and the chi-square test was used to find the statistical significance. Statistical significant level is at P value <0.05.

RESULT

A total of 153 children were examined. The age group varied between three months to 12 years with mean age of 5.99. There were 83(54.2%) males and 70(45.8%) females. The population studied consists of Malay 84(54.9%), Indian 39(25.5%), Chinese 25(16.3%) and others 5(3.3%).

There was no significant statistical relationship between OME and age, sex, race, single or both parent's presents, or number of siblings. The relationship between OME and visit to day-care centre, breast-feeding in childhood, passively exposed to smoking, allergy and asthma were also found to be statistically not significant. Table III shows the relationship between OME and risk factors.

With regards to the prevalence of AOM, 14 out of 153 were diagnosed as AOM in last three years. The children who were diagnosed with AOM had a higher incidence of OME, and this was statistically significant. The otalgia was present in 14 children. Four of the children had hearing problem. None of the children in this study had undergone any otological surgery. Table IV shows the relationship between AOM and OME, analysed using chi-square test.

DISCUSSION

The prevalence of OME is rather variable, ranging from 1.3 to 31.3%, which affect by the geographical area, races and studied population. The prevalence was 9.5% in Caucasians,⁵ 5.3% in Chinese,⁶ 13.8% in Malaysian population.⁷ In the literature, the range of prevalence of OME is wide as the population studied, the countries, environmental factors and climatic factors were different.⁸ In our study, the overall prevalence of OME was 18.3%. There were studies which

Table II: Questions of relationship between AOM and OME

Any history of ear infection in last 3 years?
Any history of pus/fluid discharge in last 3 years?
Any hearing problem with child?
Any earache in last 3 years?
Any previous ear surgery done?

showed higher prevalence in male,^{9,10,11} owing to higher incidence of infectious disease in male. However, there were also studies which showed no gender preponderance.⁷ We did not find any significant difference in prevalence of OME between male and female in our data. In the West, there were studies which showed prevalence of OME to be higher in the whites than in blacks,¹² Indians and Eskimos.⁹ Our result did not show any significant difference between different races, consist of Malays, Chinese, and Indians which is consistent with previous Malaysian studies.⁷

Gultekin *et al.* and Sassen showed that higher number of siblings in family increases the risk of OME.^{13,14} We did not find significant relationship between the number of siblings and the prevalence of OME. Children who attended daycare centres have increased risk of OME due to overcrowding and increased risk of cross infection in studies done earlier.^{1,13,15,16,17,18} However Sassen did not establish significant relation between OME and daycare stay after the confounding factors were eliminated.¹⁴ Our study also did not identify any significant relationship between OME and attendance to daycare center. The confounding factor needs to be taken into consideration before a conclusion is reached.

Various studies done in the past support the protective role of breast-feeding and development of OME,^{7,10,11,19} but other studies did not establish a significant relationship between the two.^{13,14,20,21} Breastfeeding may be protective in early years of life, but its protective action may not cover the older children. We could not establish any statistical relation between exposure to passive smoking and development of OME. This is parallel with the findings of previous studies done by Blackley and Blackley,⁴ and few others.^{7,14,21-23} There were a few other studies, which clearly demonstrated the relationship between the two.²⁴⁻²⁶ No significant association was also found between allergy and asthma in relation to OME, which was similar to previous studies done by Saim,⁷ but contrasted with the study done by E.Gultekin.¹³ Of the 153 children screened, ¹⁴ were diagnosed as AOM in last three years. Alho *et al.* also showed that previous AOM was the greatest risk factor for the development of OME.¹ AOM interferes with the Eustachian tube functions and leads to accumulation of fluid in the middle ear as found by Sassen.¹⁴

Table III: Relationship between OME and risk factors

Risk factors	No of children	OME present	P value
Gender			
Male	83	14	0.677
Female	70	14	
Race			
Malay	84	15	0.603
Indian	25	5	
Chinese	39	6	
Others	5	2	
Parents			
Single	2	2	0.033
Both	151	26	
No of children			
1	19	5	0.808
2	44	8	
3	51	8	
4	29	6	
5	5	1	
>=6	5	0	
Day care centre			
Yes	103	20	0.663
No	50	8	
Exposed to passive smoking			
Never	87	12	0.254
Rarely	21	5	
Frequently	45	11	
Allergy			
Yes	24	7	0.153
No	129	21	
Asthma			
Yes	30	7	0.436
No	123	21	

P value obtained by chi-square test

Table IV: Relationship between AOM and OME.

Problem	No of children	OME present	P value
Diagnosed with ear infection			
Yes	14	10	<0.001
No	139	18	
Hearing problem			
Yes	4	3	0.296
No	149	125	
Pus discharge			
Yes	14	4	0.366
No	139	24	
Earache			
Yes	17	11	<0.001
No	137	17	
Surgery to ear			
Yes	0	0	Not available
No	153	28	

P value obtained by chi square test

CONCLUSION

The prevalence of OME in Malaysian children between three months to twelve years old is 18.3%. Those children suffering from frequent episodes of AOM have increased risk of development of OME later on. Other factors such as gender, race, household size, daycare center attendance, breastfeeding, exposure to smoking, allergy, asthma were not statistically significant.

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