

Otitis Media with Effusion in Relation to Socio Economic Status: A Community Based Study

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Abstract Otitis media with effusion (OME) is the presence of non purulent effusion within the middle ear cleft. The symptoms of this disease are not alarming as in suppurative otitis media. The disease is common in young children. The main symptom of this disease is decreased hearing, which may sometime go unnoticed more so if the parents are not attentive. We conducted a community based study among 1,020 school children of the age group 5–10 years from schools of sub-urban areas of Dakshina Kannada district, Karnataka, to explore the relationship of OME in relation to socioeconomic status. Diagnosis of OME was done by clinical examination and tympanometry. Prevalence of OME was 4.5%. Out of 46 cases, 4% belong to upper class, 26% to upper middle class, 26% to lower middle class, 43% to upper lower class.

Keywords Otitis media with effusion ·
Socio economic status

Introduction

Otitis media with effusion (OME) is presence of non purulent effusion within the middle ear cleft. The fluid may be mucous or serous but never purulent [1]. It is one of the common reasons for deafness among children. When inadequately treated, otitis may lead to major functional limitations like permanent hearing loss and impairment in development of speech and language [2].

Social class position is a powerful predictor of illness and death from many forms of both chronic and infectious disease. According to study by Lynch & Kaplan, with increasing higher class position, health improves, and with descending class position health deteriorates [3].

In the study conducted by Chadha, Agarwal, Gulati, Garg, lower socioeconomic status was found to have higher prevalence rate of OME compared to higher socioeconomic status [4].

In this study, we have studied the prevalence of secretory otitis media in school children of Dakshina Kannada district and also the relationship between secretory otitis media and socio economic status in school children of sub-urban areas of Dakshina Kannada district.

Aim of the Study

To explore the relation of OME and socio economic status.

Materials and Methods

The cross-sectional study was conducted among 1,020 children of age ranging from 5 to 10 years from five schools of suburban areas of Dakshina Kannada district. An informed consent was taken from the parents and school authorities in local language. After taking a detailed history with respect to the ear symptoms like earache, ear discharge or decreased hearing, detailed ENT examination was carried out and clinical assessment of hearing was done with tuning fork. Tympanometry was carried out with GSI autotymp audiometer. Students with intact tympanic membrane and Type B tympanogram (flat) were diagnosed as secretory otitis media. For each case, two controls were

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taken matching them in terms of age, sex and area of residence they belong to.

Per capita income of the family, education and occupation of the head of the family of students of both the groups was obtained from parents or guardians or from school records and accordingly both cases and controls were categorized under different socioeconomic status separately with the help of Kuppuswamy classification [5].

The data obtained was analyzed using unpaired student's *t* test and odds ratio for case control study.

Results

We studied 1,020 students from five randomly selected schools in the sub-urban areas of Dakshina Kannada district, Karnataka. We found OME in 46 children. Prevalence of OME was 4.5%.

In our study, among the cases of OME, 57% were girls and 43% were boys. Out of 46 cases, 4% belong to upper class, 26% to upper middle class, 26% to lower middle class, 43% to upper lower class. And out of 92 controls 3% belong to upper class, 61% to upper middle class, 24% to lower middle class, 12% to upper lower class. Maximum number of children with OME belonged to upper lower class (43%) and large number of cases also belonged to lower middle class (26%). There is a strong association between socioeconomic status and OME ($P < 0.001$, highly significant). Out of 20 boys with OME, 10% belong to upper class, 20% to upper middle class, 25% to lower middle class, 45% to upper lower class. Out of 40 healthy boys taken as controls, 7% belong to upper class, 50% to upper middle class, 33% to lower middle class and 10% to upper lower class. There is a strong association between socioeconomic status and OME ($P = 0.025$, significant) among boys. Out of 26 girls with OME, 31% belong to upper middle class, 27% to lower middle class and 42% to upper lower class. Out of 52 healthy girls taken as controls, 69% belong to upper middle class, 17% to lower middle class and 13% to upper lower class. In case of girls, there is a very strong association between socioeconomic status and OME ($P = 0.01$, significant). By considering group 1 [upper class + upper middle class] as higher socioeconomic status group and Group 2 [lower middle class + upper lower class + lower class] as lower socioeconomic status group, odd's ratio is 4 i.e., group 2 children are four times higher risk than group 1 children. Group 2 boys are 2.7 times higher risk than group 1 boys. Group 2 girls are 5.8 times higher risk than group 1 girls.

Discussion

There is a positive correlation between socioeconomic status and OME ($P < 0.001$, very significant). Out of 46

cases, 43% are from upper lower class and 26% from upper middle class. Whereas in controls, 61% are from upper middle class and 12% from upper lower class. In case of children with OME, as we go down from upper middle class to upper lower class percentage of secretory otitis media increases and was found to be highest in upper lower class. But in case of healthy children taken as controls, the number of disease free children was found to be highest in upper middle class. This implies that children of lower socioeconomic status are more susceptible to secretory otitis media similar to all other earlier studies [4, 6] but goes against study by Owen et al., who reported that the higher the socioeconomic status, higher prevalence the otitis media [7].

In the study conducted by Rushton et al. Chinese children in 175 children aged 5–6 years old have been reported to have a lower prevalence rate (1.3%) than Caucasian children (9.5%) [8]. While this study showed lower prevalence in lower socio economic status, in our study we found out that there was higher prevalence of Otitis media of effusion among students belonging to lower socio economic status. The reasons for the higher number in lower socio economic status might be the poor hygiene standards in this population, overcrowding in these families and most importantly poor nutritional status of these children. In addition to the impairment of physical growth and of cognitive and other physiologic functions, malnutrition also has effect on immune response changes like loss of delayed hypersensitivity, fewer T lymphocytes, impaired lymphocyte response, impaired phagocytosis secondary to decreased complement and certain cytokines, and decreased. Secretory immunoglobulin A (IgA) are seen in malnourished children which predispose children to severe and chronic infections and also to opportunistic and other typical childhood infections. As both humoral and cell mediated immunity are reduced in malnutrition, they are more prone to infection than the non malnourished children. Thus Malnutrition predisposes to infection and

Table 1 Distribution of cases and controls according to socio economic status (Kuppuswamy classification)

	Cases (n = 46)	Controls (n = 92)
Upper class	2 (4%)	3 (3%)
Upper middle class	12 (26%)	56 (61%)
Lower middle class	12 (26%)	22 (24%)
Upper lower class	20 (43%)	11 (12%)
Lower class	0	0
Total	46	92

($P < 0.001$)

The bold number signifies the majority in cases and controls belonging to a particular socioeconomic class

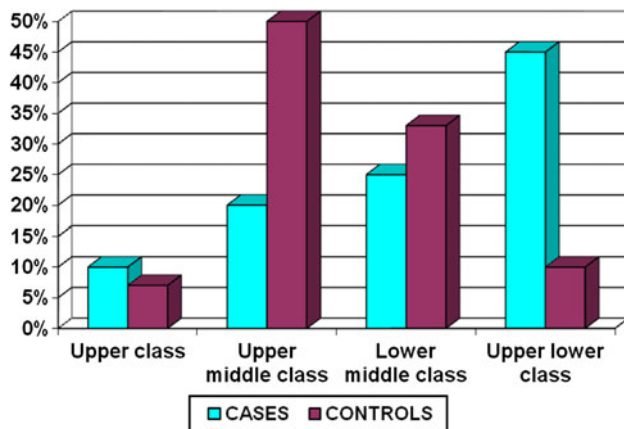


Fig. 1 Classification of cases and controls (boys) according to socioeconomic status

infection to malnutrition. Hence lower socio economic status children are susceptible for malnutrition and thus a higher chance of getting OME (Table 1; Fig. 1).

Conclusion

Otitis media with effusion has a strong positive correlation with socio economic status.

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