Secretory Otitis Media In Relation To MalNutrition: 
A Community Based Study

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Abstract

Background: Secretory otitis media (SOM) is a common cause of medical consultation in children. The disease is more common in children of low socioeconomic class. As the patients are young children and since the symptoms are not alarming, the condition is likely to be left undiagnosed in many cases.

Aims and objectives of the study:
- To study the prevalence of secretory otitis media in children.
- To explore the relationship of secretory otitis media with malnutrition.

Materials and Methods: 
Study type: A cross-sectional study for determining prevalence, with a case-control design in a community setting of the Dakshina Kannada District.
Duration of the study: 3 months
Sample size: 1020 children ranging from 5 to 10 years of age from five schools
Method: Two controls were taken for each case, matching them in age, sex and place. Weight of cases and controls were recorded and graded according to the Indian Academy of Pediatrics Classification of Malnutrition.

2010 Volume 3(2)
Results: Prevalence of secretory otitis media was 4.5%. The majority were female comprising 57% of the subjects. We found a positive association between malnutrition and secretory otitis media in our male subjects.

Introduction

Secretory otitis media (SOM) is presence of nonpurulent effusion within the middle ear cleft. The fluid may be mucous or serous but never purulent. It is one of the common reasons for medical consultation among children. When inadequately treated, it may lead to major functional limitations like permanent hearing loss and impairment in development of speech.

Malnutrition is globally the most important risk factor for illness and death, contributing to more than half of the deaths in children worldwide. In the cross-sectional prospective study conducted among 280 children in Dhaka and adjacent cities of Bangladesh by Mani Lal Aich, Akhil Chandra Biswas, Miraj Ahmed, et al, prevalence of SOM in children ranging from 4 to 9 years was found to be 19%.

In the study conducted by Lasisi AO, et al, malnutrition is one of the significant risk factors in causation of chronic suppurative otitis media. Elemraid MA, has also reported an association of otitis media with deficiencies of micronutrients like zinc and vitamins such as vitamin A. In this study, we have studied the prevalence of SOM in school children of Dakshina Kannada District of Karnataka State and also the relationship between SOM and nutritional status.

Aims And Objectives:

- To study the prevalence of SOM in school children of the Dakshina Kannada District.
- To explore the relationship of SOM with malnutrition.

Methods

Study type: A cross-sectional study for determining prevalence, with a case-control design in a community setting of the Dakshina Kannada District.

Duration of the study: 3 months
Sample size: 1020 children ranging in age from 5 to 10 years from 5 schools

Method of collection of data: A cross-sectional survey was conducted among 1020 children with ages ranging from 5 to 10 years from 5 schools of the Dakshina Kannada District’s suburban areas. A detailed history was taken especially with respect to ear symptoms of earache, ear discharge or decreased hearing. A detailed ENT examination was carried out and clinical assessment of hearing was done with tuning fork. Tympanometry was carried out with a GSI autotym audiometer. Students with intact tympanic membrane and Type B tympanogram (flat) were diagnosed as secretory otitis media.

For each subject with SOM, two controls were taken matching them in terms of age, sex and area of residence. The weight of cases and control were recorded and both graded according to the Indian Academy of Pediatrics Classification of Malnutrition. An informed consent was taken from the parents and the school authority in their local language.
Statistical analysis: The data obtained was analyzed using the unpaired student T-test and odds ratio for the case-control study.

Results

We studied 1020 students from 5 randomly selected schools in the rural areas of Dakshina Kannada district and we found Secretory Otitis media in 45 children.

The prevalence of Secretory otitis media was 4.5%. The prevalence was highest in the age group of 8-9 years (44%). Among the cases of Secretory otitis media, 57% were girls and 47% were boys.

Out of the 46 cases, 27 students were malnourished i.e., 59% of the cases are malnourished whereas among controls 32% were malnourished. Out of the 27 malnourished cases, 13 were boys and 14 were girls i.e., 65% and 54% of total boys and girls respectively. Out of the 29 malnourished controls, 8 were boys and 21 were girls i.e., 20% and 40% of the total boys and girls controls respectively.

There was a positive association between malnutrition and secretory otitis media (p=0.01, significant). Odd’s ratio was 4.5 i.e., malnourished children have 4.5 times higher risk of developing secretory otitis media than normally nourished children. In case of boys, there was a strong association between malnutrition and secretory otitis media (p<0.01, significant). The odd’s ratio was 7.4 i.e., malnourished boys have 7.4 times of developing secretory otitis media than normally nourished boys. In case of girls, association between secretory otitis media and malnutrition was not significant (p=0.1, not significant)-- See Figures Below.
MALNUTRITION AMONG CASES AND CONTROLS (BOYS)

MALNUTRITION AMONG CASES AND CONTROLS (GIRLS)
Discussion

Downs, MP was one of the first authors to postulate a possible relationship between middle ear effusions and malnutrition. Animal studies have found otitis media to be more common in rats with vitamin D deficiency (rickets) and vitamin A deficiency but there is little, if any human research data in the literature concerning the likelihood of developing otitis media in malnourished children.

In a cross-sectional study conducted among 280 children in Dhaka and adjacent cities of Bangladesh, Aich ML, et al. found the prevalence of secretory otitis media (SOM) in children ranging from 4 to 9 years to be 19%. In our study we found a incidence of 4.5%. The difference in prevalence between these studies can be due to the low socioeconomic standards of the cities in Dhaka compared to the places selected in our study. Overcrowding and unhygienic personal habits can also contribute to high susceptibility to SOM.

William, et al, reported that SOM is more common in five years old with prevalence of 17% compared to 6% in eight years old. Midgley E J, et al, reported that it's prevalence decreases with age, thus with the screening of school children between 8-13 years, only 1-5% were found to have SOM. Farida Khan, et al, reports that the majority, i.e., 62% of the patients were between 5-8 years.

In our study, prevalence rate of otitis media is 4.5%. We found a significant relationship between malnutrition and SOM (p = 0.01). As 59% of the cases were malnourished and only 32% of the controls were malnourished, it implies that malnutrition is a risk factor for SOM. The highest prevalence (44%) was found in the age group of 8-9 year old children.

Malnourished children are more prone to developing SOM. Probable cause for them being susceptible to infection is damage to the immune mechanism. In addition to the impairment of physical growth and of cognitive and other physiologic functions, immune response changes like loss of delayed hypersensitivity, fewer T lymphocytes, impaired lymphocyte response, impaired ased 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 normal nourished children.

In the case of boys, a strong association exists between malnutrition and SOM was found (p<0.01, significant). In comparison to the 65% of the cases who are malnourished, only 20% of the controls are malnourished. Thus it implies that malnutrition is a risk factor for SOM. But in the case of the girls, there is no association between malnutrition and SOM (p = 0.1, not significant). Therefore, this association maybe somehow related to sex hormones. In males, malnutrition was a major risk factor whereas in females it was not found to have any significance.

Conclusion

1. The prevalence of Secretory otitis media in school going children from the age group of 5 to 10 years in the Dakshina Kannada District is 4.5%.

2. Secretory otitis media has a strong positive association with malnutrition.
References


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2010 Volume 3(2)