

Original article:

Assessment of Otitis Media and Associated Symptoms in Rural

Population: A Prospective Study

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Abstract:

Background: Chronic active or suppurative otitis media affects 65 to 330 million people worldwide, and more than half of these patients have significant hearing impairment. Worldwide, COM is responsible for an estimated 28,000 deaths annually, and is associated with a disease burden involving more than 2 million individuals daily. Aim of the study to evaluate the risk factors of otitis media in rural population.

Materials and methods: The study was conducted in the Department of ENT of the Government S.K. Hospital, Sikar, Rajasthan, India.. From the records we selected patients who belonged to rural areas. A total of 48 patients were selected. Patients aged < 20 years and those with cancer were excluded. The diagnosis of COM was determined by trained residents using a systematic ENT questionnaire. Information on the patients' socioeconomic status was investigated. The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student's t-test and Chi-square test were used to check the significance of the data.

Results: The number of male patients in the study was 29 and no of female patients in the study were 19. The mean age of the patients was 41.81 years. Statistically significant results were seen with respect to smoking status, income, BMI, earphone use and health status.

Conclusion: Within the limitations of present study we conclude that incidence of otitis is media is more in rural area. The common risk factors are smoking, earphone usage, elevated BMI and poor health status.

Keywords: otitis media, smoking, ear, hearing loss

Introduction:

Chronic suppurative otitis media (CSOM) is an infection of the middle ear cleft characterised by perforation of the tympanic membrane and persistent otorrhoea. CSOM is a substantial global health problem with an estimated incidence of about 31 million cases per year.^{1, 2} Approximately 22.6% of cases occur in children under five. This disorder is a major cause of acquired hearing loss, especially in

developing countries, and is a major disease entity in the field of otolaryngology. It often requires expensive treatment and ear surgery, and can induce severe or fatal complications such as mastoiditis, facial nerve palsy, labyrinthitis, petrositis, brain abscessation, meningitis, and thrombophlebitis. COM also decreases patients' quality of life.^{3, 4} Chronic active or suppurative otitis media affects 65 to 330 million people worldwide, and more than half of

these patients have significant hearing impairment. Worldwide, COM is responsible for an estimated 28,000 deaths annually, and is associated with a disease burden involving more than 2 million individuals daily.^{5, 6}Otitis media in developing countries poses a special problem particularly in the preschool age group. A number of risk factors are associated with otitis media. Host factors that lead to increased risk include male sex, age less than 3 years and a member of the family with acute otitis media. Environmental factors include day care attendance, parental smoking, poor ventilation, low socioeconomic status, and lack of adequate breast feeding. Other risk factors include race, altered host defenses, and seasonal variation.^{7, 8} Hence, the present study is planned to evaluate the risk factors of otitis media in rural population.

Materials and methods:

The study was conducted in the Department of ENT of the Government S.K. Hospital, Sikar, Rajasthan, India. . The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. For the study we retrospectively viewed the medical records of the patients who were diagnosed with otitis media. From the records we selected patients who belonged to rural areas. A total of 48 patients were selected. Patients aged < 20 years and those with cancer were excluded.

The diagnosis of COM was determined by trained residents using a systematic ENT questionnaire and the following otoendoscopy findings: tympanic membrane perforation and/or cholesteatoma, including congenital cholesteatoma, and a retraction pocket and/or otitis media with effusion, including patients with insertion of a ventilation tube. Information on the patients' socioeconomic status

was investigated, income, occupation (white-collar: manager, professional, clerk, service/sales worker, unemployed, retired, student, or housewife; blue-collar: agriculture, forestry, fishery worker, craft and related trade worker, plant or machine operator or assembler, or simple laborer), and earphone use. Information was also collected on each patient's smoking status, alcohol drinking status, and subjective health status (very good, good, average, poor, or very poor). Each patient's body mass index was categorized as either < 25 or > 25 kg/m².

The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student's t-test and Chi-square test were used to check the significance of the data. The p-value less than 0.05 was predetermined as statistically significant.

Results:

Table 1 shows demographic data of the patients. In the current study a total of 48 patients were included. The number of male patients in the study was 29 and no of female patients in the study were 19. The mean age of the patients was 41.81 years. Table 2 shows the frequency of various characteristics of risk factors in the study group. Alcohol consumption was seen in 22 patients. 8 patients were smokers. The maximum number of patients were seen in the group with income ranging between 75-100 % (n=16). White collar job was seen in 33 patients and blue collar job was seen in 15 patients. The number of patients with BMI <25 was 31 and \geq 25 was 17. Earphone use was seen in 22 patients. The majority of patients had average health status (n=28). On comparing the results, statistically significant results were seen with respect to smoking status, income, BMI, earphone use and health status (p<0.05).

Discussion:

Many previous studies have investigated the prevalence and risk factors of COM. Its reported prevalence in Southeast Asia, Africa, and Western Pacific countries is 2–4%, and that in North America and European countries is < 2%. Risk factors of COM include low socioeconomic status, malnutrition, high number of children in the household, family history, and passive exposure to smoking.^{9, 10}

In the present study a total of 48 patients were evaluated. The mean age was 41.81 years. We observed that smoking status, income, BMI, earphone use and health status are common risk factors for otitis media in our study group. Zhang Y et al integrated the findings and determined the possible risk factors for COM/ROM based on our meta-analysis. A comprehensive search of electronic bibliographic databases from 1964 to Dec 2012, as well as a manual search of references of articles, was performed. A total of 2971 articles were searched, and 198 full-text articles were assessed for eligibility; 24 studies were eligible for this meta-analysis. Regarding risk factors for COM/ROM, there were two to nine different studies from which the odds ratios (ORs) could be pooled. The presence of allergy or atopy increased the risk of COM/ROM. An upper respiratory tract infection (URTI) significantly increased the risk of COM/ROM. Snoring appeared to be a significant risk factor for COM/ROM. A patient history of acute otitis media (AOM)/ROM increased the risk of COM/ROM. Passive smoke significantly increased the risk of COM/ROM. Low social status appeared to be a risk factor for COM/ROM. Their meta-analysis identified reliable conclusions that allergy/atopy, URTI, snoring, previous history of AOM/ROM, Second-hand smoke

and low social status are important risk factors for COM/ROM. Other unidentified risk factors need to be identified in further studies with critical criteria. Salah M et al analyzed the risk factors that are likely to be responsible for RAOM in infants, and their impact on treatment failure. A retrospective study on 340 infants with RAOM was conducted. Data were collected from hospital charts. A 10 days course of amoxicillin/clavulanate was used for treatment of recurrence, while surgical management in the form of adenoidectomy and/or myringotomy was reserved for patients with persistent disease. We analyzed various risk factors that may affect the prognosis of RAOM, including: age, prematurity, upper respiratory tract infections (URTI), duration of breastfeeding, use of pacifiers, parental smoking, seasonality, the presence of siblings (family size), gender, adenoid hypertrophy, allergy, and craniofacial abnormalities. Use of pacifiers, short duration of breastfeeding, older infantile age, winter season, URTI and presence of adenoid hypertrophy were identified as risk factors for RAOM. Treatment failure may be due to adenoid hypertrophy, short duration of breastfeeding and it is more common in older age infants. We did not find a significant association between RAOM and gender, prematurity, exposure to passive smoking, the presence of siblings, allergy, craniofacial abnormalities. This can be concluded that factors that may cause recurrence of the disease in infant population are use of pacifiers, short duration of breastfeeding, older infantile age, winter season, upper respiratory tract infections and adenoid hypertrophy.^{11, 12}

Park M et al evaluated the prevalence and risk factors of COM in Korea. This study was conducted using data from the fifth Korean National Health and Nutrition Examination Survey (n = 23,621). After

excluding the subjects under 20 year old and suffered from cancers, 16,063 patients were evaluated for COM. Participants underwent a medical interview, physical examination, endoscopic examination, and blood and urine test. COM was diagnosed by trained residents in the Department of Otorhinolaryngology using an ear, nose, and throat questionnaire and otoendoscopy findings. Data on the presence and absence of COM were collected. Multivariate logistic regression analyses were performed to identify its risk factors. Of the 16,063 participants aged above 20 year old, the weighted prevalence of COM was 3.8%. In the multivariate analyses, the following factors showed high odds ratios for COM: pulmonary tuberculosis, chronic rhinosinusitis, mild hearing impairment, moderate hearing impairment, tinnitus, increased hearing thresholds in pure tone audiometry in the right ear, and left ear. The following factors showed low odds ratios for COM: hepatitis B and rhinitis. In addition, high levels of vitamin D, lead, and cadmium, EQ-5D index; and low red blood cell counts were associated with development of COM. They concluded that COM is not rare in Korea, and its development may be associated with various host and environmental factors. Labout JAM et al study in a population-based prospective cohort the risk factors for otitis media in the second year of life with special emphasis on the role of colonization with

Streptococcus pneumoniae, *Haemophilus influenzae* and *Moraxella catarrhalis*. The study was embedded in the Generation R Study. Data on risk factors and doctor-diagnosed otitis media were obtained by midwives, hospital registries and postal questionnaires in the whole cohort. Nasopharyngeal swabs were obtained at the age of 1.5, 6 and 14 months in the focus cohort. Of these children, 2,515 suffered at least one period of otitis media in their second year of life. The occurrence of otitis media during the follow-up period in the first 6 months of life and between 6 and 12 months of age was associated with the risk of otitis media in the second year of life. Having siblings was associated with an increased risk for otitis media in the second year of life. No associations were found between bacterial carriage in the first year of life and otitis media in the second year of life. In their study, otitis media in the first year of life was an independent risk factor for otitis media in the second year of life. Surprisingly, bacterial carriage in the first year of life did not add to this risk.^{13, 14}

Conclusion:

Within the limitations of present study we conclude that incidence of otitis media is more in rural area. The common risk factors are smoking, earphone usage, elevated BMI and poor health status.

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Diags and tables:

Table 1: Demographic details of the patients

Variables	No. of patients
Total number of patients	48
No of male patients	29
No of female patients	19
Mean age (years)	41.81

Fig 1: Demographic details of the patients

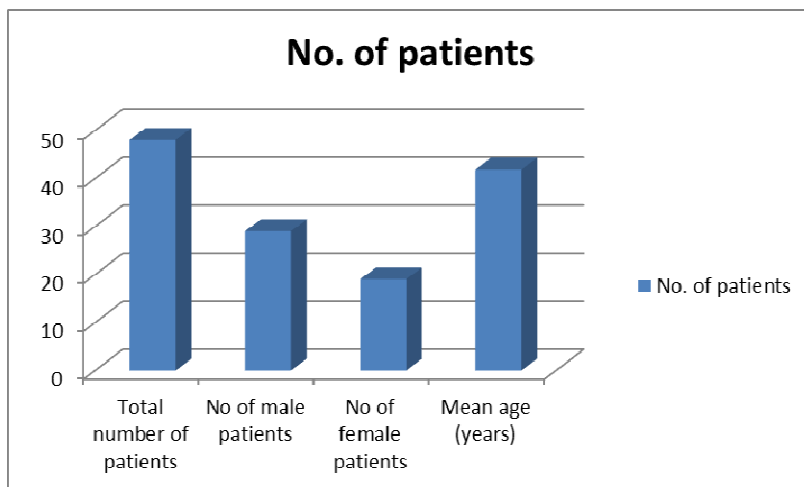


Table 2: Characteristics of rural population and no of patients with positive findings

Characteristics	No. of patients with positive findings	p-value
Alcohol consumption	22	0.21
Smoker	8	0.02
Income		0.05
• <25%	10	
• 25-50%	11	
• 50-75%	13	
• 75-100%	16	
Occupation		0.21
• White collar job	33	
• Blue collar job	15	
BMI		0.005
• <25	31	
• ≥25	17	
Earphone use	22	0.02
Health status		0.01
• Very good	11	
• Average	28	
• Poor	9	