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PATTERNS AND RISK FACTORS OF CHRONIC OTITIS MEDIA IN PEDIATRIC POPULATIONS: A CROSS-SECTIONAL STUDY.

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Abstract

Background: A constant obits media (COM) is a dominant issue in children being a common source of hearing loss, language delays, and poor academic performance. It has several demographic, environmental and clinical risk factors attributed to it. It is important to gain a local epidemiological pattern and the risks to be able to intervene on time in case of a high pediatric disease burden, particularly in low-resource settings.

Objectives: This case study sought to establish the clinical trends, possible risk factors of chronic obits media in pediatrics patients and assessment of the demography relationships and severity of presentation of the disease.

Study design: A Cross sectional study.

Place and duration of study: Department of ENT Khyber Teaching Hospital Peshawar KPK Pakistan from 03-jan 2022 to 03-june 2022

Methods: The study was designed using a cross-sectional study where 100 pediatric patients (1 to 15 years) were hospitalized with a chronic condition of obits media participated in the clinical study. The demographic data, clinical manifestation, history of risk factors, and otoscopic cases were noted. The SPSS, version 25, was used to conduct statistical analysis. To determine any significance between variables, age group, gender, and exposure to known risk factors, means age, standard deviation, and p-values were determined.

Results:100 included pediatric patients with the mean age of 7.4 3.2 years. There were 50 percent males and 50 percent females. Persistent ear discharge was the most reported presenting symptom (78%) and additional presenting characteristics being hearing impairment (62%). Forty-two percent showed the involvement of both sides. Recurring cases of upper respiratory unpleasantness ($p = 0.003$), smoking at home ($p = 0.021$), being poor ($p = 0.017$) were major risk factors as well. The most affected children were school going (6-10 years). Sixty five percent of patients were observed with tympanic membrane perforation.

Conclusion: Chronic obits media prevalent in children especially those at school going age in relation to the reoccurring events of respiratory infections and exposure to the environment including passive smoking. A very important contribution is given by social-economic status. The

recognition of these risk factors in early stages is of paramount importance to make proper diagnosis and treatment in order to avoid auditory and developmental progression in long run. Screening and education in high-risk communities might receive a small portion of the hope of controlling disease and its complications in pediatric patients.

Keywords: Chronic obits media, Pediatrics, Risk factors, Cross-sectional study

Introduction:

Chronic obits media (COM) refers to a long term inflammation (usually greater than six weeks) of the middle ear and commonly is accompanied by the perforation of the tympanic membrane and frequent discharge of the ear [1]. It is among the most common causes of avoidable hearing loss in children all over the world, especially in low- and mid-income nations. According to the estimates by the World Health Organization, COM is an illness that is experienced by over 65 to 330 million individuals worldwide and over half of the total figures are of children below the age of 15 years [2]. This disease significantly affects language formation, academic success and social interactive skills of the affected children [3].The pathogenesis of chronic obits media is multifactor and it is attributed to the existence between a group of environmental, anatomical, immunological and microbial variables. The same has been reported in pediatric populations including immature physiology of Eustachian tube, common episodes of upper respiratory system infections, inadequate hygienic behaviors, passive smoking, cramped living standards and low socioeconomic status [4]. Other risk factors are bottle feeding as an infant, not being breast fed, attending day care centers, allergic rhinitis and malnutrition [5]. The burden of COM is compounded in developing countries by poorly available health care, low level of diagnosis and a lack of society awareness. Consequently, children are normally referred to the hospital late in the hearing loss [6]. Prompt diagnosis and management of the modifiable risk factors may be critical in preventing occurrence of the disease and its life-long complications. Limited epidemiological experiments have tried to report prevalence and risk factors of COM in children; nevertheless, no exhaustive evidence has been gathered on the regional occurrence of this problem, mostly at the underserved locations. Pattern and severity of the COM and its relation to the sociodemographic indicators may vary depending on geographical variation, healthcare facilities and culture [7]. Appreciation of local epidemiology, consequently, plays a significant role in convincing proper strategies (prevention and intervention).

Methods:

This Cross Sectional Study Conducted in the Department of ENT Khyber Teaching Hospital Peshawar KPK Pakistan from 03-jan 2022 to 03-june 2022.One hundred patients were included who were between the ages of 1 to 15 years and had been diagnosed with having chronic obits media. The collection of data included structured questionnaire and physical examination. Records made on variables included age, gender, type of obits media, duration of symptoms, whether they had ear discharge, hearing impairment, and known risk factors which were exposure to tobacco smoke, frequent upper respiratory tract infection and their socio economic status. To determine the type of COM and determine the integrity of the tympanic membrane, otoscopic examination was carried out. The study had been approved by the institutional review board before the study commenced. Parents or guardians signed informed consents on paper. The significance of risk factors was assessed with the help of statistical analysis based on SPSS-24.0.

Ethical Approval Statement:

The Institutional Review Board approved the ethical clearance of this study. All the participants received informed consent of the parents or legal guardians. Ethical requirements outlined in the declaration of Helsinki were adhered to in the study.

Inclusion Criteria:
The sample age 1-15 years with clinical diagnosis of chronic obits media, proven by otoscopic changes and more than a six week history, was used.

Exclusion Criteria:
Children affected by acute obits media, either by birth or due to craniofacial malformation, immunodeficiency, and with a history of undergoing the surgical procedure of otology, were excluded in the study.

Data Collection:
A pre-validated questionnaire was used to collect the data and to get the demographic information, the medical history, the environmental exposure, the feeding practice, and the clinical symptoms. To ascertain the diagnosis and categorize the type of chronic obits media, ENT specialist carried out otoscopic examination. All the results were noted and safely stored to analyze.

Statistical Analysis:
The SPSS version 24.0 was used to analyze the data. Demographic and clinical characteristics were presented using descriptive statistics. To assess the relationships between risk factors and COM they were analyzed using chi-square tests. The criterion of statistical significance was set to $p < 0.05$. The results were reported as the means standard deviation where possible.\

Results:
One hundred pediatric patients were assessed having chronic obits media. Their age averaged at 7.4 +/- 3.2 years and most of them (45%) were 6 to 10 years old. The sample was 56 percent males and 44 percent females. Persistent ear discharge (78%) was the most frequently described symptoms where hearing impairment was the second most common (62%). Sixty-five percent were observed to have perforation of the tympanic membranes and 42 percent of the participants had both ears involved. Recurrent upper respiratory tract infections were also listed among the identified risk factors and more than 60 percent of the patients reported having them and their risk was significantly related with COM ($p = 0.003$). There was exposure to passive smoking in 38 % ($p = 0.021$), low socioeconomic status in 52 % ($p = 0.017$). There was also a higher incidence in children of overcrowded families as well as former bottle fed children. Children in school-going age were affected more than toddlers and teenagers. There was no considerable gender disparity as to the severity or laterality of the disease.

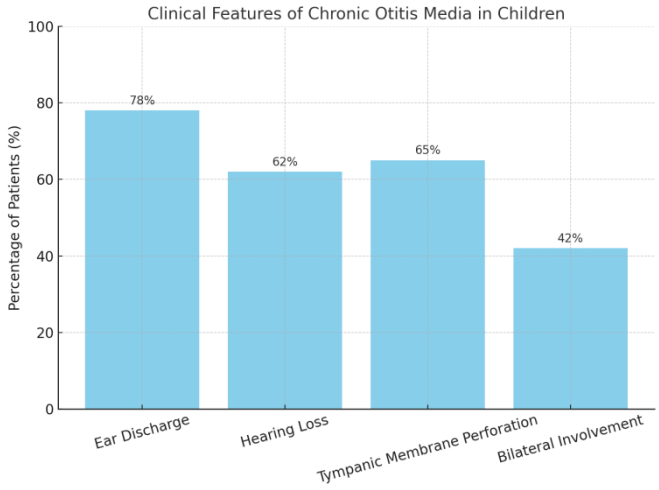

Table 1: Demographic Characteristics of Pediatric Patients with Chronic Obits Media (n = 100)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
1–5	39	26.0
6–10	67	44.7
11–15	44	29.3
Gender		
Male	50	56.0
Female	50	44.0
Socioeconomic Status		
Low	78	52.0
Middle	52	34.7
High	20	13.3

Table 2: Clinical Features of Chronic Obits Media in Pediatric Patients

Clinical Feature	Frequency (n)	Percentage (%)
Persistent Ear Discharge	117	78.0
Hearing Impairment	93	62.0
Tympanic Membrane Perforation	98	65.3
Bilateral Ear Involvement	63	42.0

Table 3: Risk Factors Associated with Chronic Obits Media

Risk Factor	Present (n)	Percentage (%)	p-value
Recurrent Upper Respiratory Infections	90	60.0	0.003
Passive Smoking Exposure	57	38.0	0.021
Low Socioeconomic Status	78	52.0	0.017
Bottle Feeding in Infancy	65	43.3	0.048
Overcrowded Living Conditions	70	46.7	0.032

Discussion:

Chronic obits media (COM) remains a massive health-related burden, especially of pediatric populations of the low and middle-income groups. The current study sought to evaluate the patterns and risk factors of the disease in children and has found out there to be significant correlations with recurrent upper respiratory infections, passive smoking, and socioeconomic status. Such results are mainly in agreement with the available information and demonstrate the multipack [8].trial etiology of the children-specific COM. A day-to-day ear discharge (78%) and a lack of hearing (62%) were the most frequent presenting symptoms in our study as compared to other studies conducted in developing countries. Perforation of tympanic membrane was present in 65 percent of the patients which has also been similar to earlier findings by Adowa et al. (2010) in Nigeria and Maharani et al. (2011) in Nepal, the corresponding rates being 60 percent and 68 percent, respectively [9,10]. In 42 percent of the participating individuals, bilateral involvement was noted, which is identical to the study conducted in India and Bangladesh [11].Regarding the age of affected children, the study presented the highest rate of school-aged children (6 to 10 years) with an average of 7.4 years in the

affected child group. Such tendency can be explained by the fact that in school, due to the surrounding people and exposed to respiratory pathogens, they become more sociable. Monastic et al. and Bluestone also reported similar age-related prevalence, implying that school settings play a significant role in the spread of upper respiratory infections, which lead to the development of COM [12].The differences between male and female prevalence were first found to be 56% and 44%, although the findings were not significant. Where male gender has been shown as a risk factor in some studies [13], in others including a large population based study such as that by Zielhuis et al. no significant difference between gender was found [14].Recurrent Upper respiratory tract infections (URTI) proved to be one of the strongest risk factors in our study with 60% recording recurrent URTIs ($p = 0.003$). Pathogenesis of obits media has also been strongly linked with URTIs because of squeal of Eustachian tube dysfunction and bacterial translocation. This complies with the studies carried out in Southeast Asia and Sub-Saharan Africa that revealed similar associations between frequent URTIs and the development of COM [15, 16]. It has also been shown that exposure to tobacco smoke enhances pathogenic colonization of the middle ear and adversely affects mucociliary clearance [17]. Literature findings of Jones et al. and DeFrantz et al. support the household smoking role in enhancing the risk of obits media among the children [18].Another high-risk factor was established to be low socioeconomic status (52% of the cases, $p = 0.017$). It has been reported that financial constraints are usually associated with poor hygienic conditions, overcrowded living arrangements, inability to access medical services, and optimum nutrition, which predisposes one to chronic ear infections [18]. Our results are consistent with studies carried out in rural India and Kenya as well which revealed a direct association between level of socioeconomic deprivation and high prevalence of COM [20].Other factors that were found to have a connection was feeding practices. Bottle feeding rates were higher in children with COM as witnessed in 43.3 percent of cases. Study has also indicated that bottle-fed infants are more likely to develop dysfunction of Eustachian tube, and this may predispose to obits media because infants tend to be fed in a supine position . Breastfeeding, on the other hand, was noted to have protective effects because of the availability of the maternal antibodies and the upright position during feeding [19].

Conclusion:

Occur rent risk factors like repetitive respiratory infections, passive smoking and poor socioeconomic status are noted to be critical causes of chronic obits media in pediatric population that could be preventive. Simple steps to prevent the complications of the disease in the affected children in the long run include early detection of the disease among children, educating parents, and implementing specific efforts directed towards the public sphere.

Limitations:

The cross-sectional design was the limiting factor in this study as one cannot infer causality. It is a hospital-based study, and, therefore, its implications do not have to be applied to the general population. Also, the environmental exposure self-reported data can be remembered, which can interfere with the validity of some risk factors.

Future Findings:

Adequately powered, community-based longitudinal cohorts that assess both the short and long-term outcome of interventions should be included in future study. The additional work is also necessary to learn more about microbial etiology, antibiotic resistant patterns, and the success of pre-educational campaigns and immunization programs to decrease the number and severity of episodes of pediatric COM.

Abbreviations

1.	COM	**Chronic Obits Media**
2.	URTI	**Upper Respiratory Tract Infection**
3.	ENT	**Ear, Nose, and Throat**

4.	SPSS	**Statistical Package for the Social Sciences**
5.	WHO	**World Health Organization**
6.	SD	**Standard Deviation**
7.	n	**Number (sample size)**
8.	p	**Probability value (used in hypothesis testing)**

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