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# To Analyse Risk Factor, Cilinical and Bacteriological Profile of Children Aged Under 6 Years with Symptomatic Otitis Media in a Tertiary Care Centre

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## ABSTRACT

**Background**: Otitis media is defined as an infection of the middle ear space. that include acute otitis media (AOM), chronic suppurative otitis media (CSOM), and otitis media with effusion (OME). Infection of the middle ear can be viral, bacterial, or coinfection. Otitis media is diagnosed clinically via objective findings on physical exam (otoscopy) combined with the patient's history and presenting signs and symptoms. However, understanding the bacterial etiology of otitis media (OM) is important when designing and evaluating the best course of treatment.

**Methods**: The present study was a single-center, observational Study conducted on children <6yrs with Otitis mediain the department of Paediatrics, Sri Siddhartha Medical College hospital and Research Centre, Tumkur from January 2021 to July 2022. Prior to initiation of the study Ethical and Research Committee clearance was obtained from Sri Siddhartha Medical College hospital and Research Centre, Tumkur (Annexure B). During present study total 100 children were reviewed in OPD/IP, among them 75 patients were enrolled into the study according to inclusion criteria and 25 patients were excluded according exclusion criteria.

**Results**: There were a greater number of cases of acute otitis media when compared to chronic otitis media (73.33%). The residents of rural areas were more prone to develop both acute (63.63%) and chronic (75%) otitis media when compared to those of residents in urban areas. The children who have siblings (76.36%) are susceptible in developing both acute and chronic otitis media when compare to those who do not have siblings (75%).Exposure to passive smoking is a significant risk factor for developing otitis media (80%) The children belonging to socioeconomic class V (50.90%) develop acute otitis media prominently whereas the children belonging to socioeconomic class IV (50%) develop chronic otitis media. Ear pain (87.27%), fever (50.90%), cough and cold (67.27%) were the highest reported profile of symptoms in acute otitis media whereas ear pain (50%), ear discharge (80%), cough and cold (55%) were the highest reported profile of symptoms in chronic otitis media. Perforation (90%) was the prominent sign in chronic otitis media followed by otorrhea, erythema tm, otitis externa, hearing loss and bulging tm. The organism reported in acute otitis media were Staphylococcus>Pseudomonas>CONS>Klebsiella. The organism reported in acute otitis media were Pseudomonas>Staphylococcus>CONS, Klebsiella.

**Conclusion**: Otitis Media is one of the most prevalent illnesses in young children around the world. To ensure quick diagnosis and treatment and significantly lower the likelihood of consequences. The risk factors include male gender, socioeconomic class, bad habits, exclusive breast feeding, passive smoking etc. Can cause speech, language, and cognitive delay.

**Key Words**: *Otitis Media, Bacteriological profile*

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## INTRODUCTION

Otitis media is defined as an infection of the middle ear space. That include acute otitis media (AOM), chronic suppurative otitis media (CSOM), and otitis media with effusion (OME).Although otitis media can occur at any age, it is most commonly seen between the ages of 6 to 24 months [1]. The disease generally proceeds through three stages: the hyperemic stage, the inflammatory stage and the suppurative stage [2]. Infection of the middle ear can be viral, bacterial, or coinfection. The most common bacterial organisms causing otitis media are *Streptococcus pneumoniae*, followed by non-typeable *Haemophilus influenzae* (NTHi), and *Moraxella catarrhalis*. The most common viral pathogens of otitis media include the respiratory syncytial virus (RSV), coronaviruses, influenza viruses, adenoviruses, human metapneumovirus, and picornaviruses. Otitis media is diagnosed clinically via objective findings on physical exam (otoscopy) combined with the patient's history and presenting signs and symptoms. Pneumatic otoscopy is the most reliable and has a higher sensitivity and specificity as compared to plain otoscopy, though tympanometry and other

modalities can facilitate diagnosis if pneumatic otoscopy is unavailable. However, understanding the bacterial etiology of otitis media (OM) is important when designing and evaluating the best course of treatment [3].

**Aim**

Risk factor analysis, clinical and bacteriological profile of children with symptomatic otitis media in a tertiary care center

**Objective**

Toanalyse the risk factors in children < 6 years with symptomatic otitis media in a tertiary care centre to study the clinical profile of children < 6 years with symptomatic otitis media in a tertiary care centreto identify the Bacteriological organisms causing otitis media and their sensitivity.

**MATERIALS AND METHODS**

The present study was a single-center, observational Study conducted on children <6yrs with Otitis mediain the department of Paediatrics, Sri Siddhartha Medical College hospital and Research Centre, Tumkur from January 2021 to July 2022. Prior to initiation of the study Ethical and Research Committee clearance was obtained from Sri Siddhartha Medical College hospital and Research Centre, Tumkur (Annexure B). During present study total 100children were reviewed in OPD/IP, among them 75 patients were enrolled into the study according to inclusion criteria and 25 patients were excluded according exclusion criteria. Patients were included in the study based on the inclusion and the exclusion criteria as mentioned below. **Inclusion Criteria** Acute onset of signs and symptoms with any of the following The Presence of middle ear effusion -Indicated by any of the following Bulging TM ,Air fluid level behind the TM, Otorrhea ,Signs and symptoms of middle ear inflammation ,Distinct erythema of TM, Distinct otalgia ,Inclusion criteria for chronic otitis media: Persistent ear discharge for > 3 weeks **Exclusion criteria:** Complications like petrositis, labyrinthitis, intracranial complications etc., Not giving consent, Post-operative middle ear surgery, Otitis externa Congenital malformation of ear, Traumatic injury, Foreign body in ear ,Patients above 6 years. The collected data was entered into Microsoft Excel Worksheet-2010 and data was taken into IBM SPSS Statistic for windows, version 24 (IBM Corp., Armonk, N.Y., USA) software for calculation of frequency, percentage, mean, standard deviation and Probability value

**Observations and Results:**

**Table 1: Subjects were distributed according to type of Otitis Media**

| Type of Otitis Media | No. of Subjects | Percentage |
|---|---|---|
| **Acute** | 55 | 73.33 |
| **Chronic** | 20 | 26.67 |
| **Total** | 75 | 100 |

**Table 2: Subjects were distributed according to resident**

| Resident | Acute | Chronic |
|---|---|---|
| **Rural** | 35 (63.63%) | 15 (75%) |
| **Urban** | 20 (36.36%) | 5 (25%) |
| **Total** | 55 | 20 |

**Table 3: Subjects were distributed according to siblings**

| Siblings | Acute | Chronic |
|---|---|---|
| **Present** | 42 (76.36%) | 15 (75%) |
| **Absent** | 13 (23.63%) | 5 (25%) |
| **Total** | 55 | 20 |

**Table 4: Subjects were distributed according to passive smoking**

| Passive Smoking | Acute | Chronic |
|---|---|---|
| **Yes** | 37 (67.27%) | 16 (80%) |
| **No** | 18 (32.72%) | 4 (20%) |
| **Total** | 55 | 20 |

**Table 5: Subjects were distributed according to socioeconomic class**

| Socioeconomic class | Acute | Chronic |
|---|---|---|
| **I** | 2 (3.63%) | 0 (0%) |
| **II** | 5 (9.09%) | 1 (5%) |
| **III** | 8 (14.54%) | 3 (15%) |
| **IV** | 12 (21.81%) | 10 (50%) |
| **V** | 28 (50.90%) | 6 (30%) |
| **Total** | 55 | 20 |

**Table 6: Subjects were distributed according to exclusive breastfeeding**

| Exclusive breastfeeding | Acute | Chronic |
|---|---|---|
| **Yes** | 19 (34.54%) | 11 (55%) |
| **No** | 36 (65.45%) | 9 (45%) |
| **Total** | 55 | 20 |

**Table 7: Subjects were distributed according to profile of symptoms**

| Profile of Symptoms | Acute | Chronic |
|---|---|---|
| Ear pain | 48 (87.27%) | 10 (50%) |
| Ear discharge | 14 (25.45%) | 16 (80%) |
| Fever | 28 (50.90%) | 9 (45%) |
| Cough cold | 37 (67.27%) | 11 (55%) |
| Irritability | 8 (14.54%) | 4 (20%) |
| Hard-of-hearing | 4 (7.27%) | 4 (20%) |
| Pulling the ear | 12 (21.81%) | 5 (25%) |

**Table 8: Subjects were distributed according to profile of signs**

| Profile of signs | Acute | Chronic |
|---|---|---|
| Erythema–TM | 39 (70.91%) | 13 (65%) |
| otorrhea | 27 (49.09%) | 17 (85%) |
| Perforation | 11 (20%) | 18 (90%) |
| Bulging TM | 4 (7.27%) | 3 (15%) |
| Hearing loss | 2 (3.63%) | 3 (15%) |
| OtitisExterna | 9 (16.36%) | 6 (30%) |

**Table 9: Subjects were distributed according to Organisms in aural swab**

| Organisms in aural swab | Acute | Chronic |
|---|---|---|
| No Growth | 36 (65.45%) | 10 (50%) |
| Staphylococcus | 9 (16.36%) | 3 (15%) |
| Pseudomonas | 5 (9.09%) | 5 (10%) |
| Klebsiella | 2 (3.63%) | 1 (5%) |
| CONS | 3 (5.45%) | 1 (5%) |

## DISCUSSION

Among the subjects of acute otitis media, 63.63% were from rural area and 36.36% were from urban areas. Among the subjects of chronic otitis media, 75% were from rural area and 25% were from urban area [4, 5]. Among subjects with acute otitis media, 76.36% had siblings and 23.63% had no siblings. Among the subjects with chronic otitis media, 75% had siblings and 25% had no siblings. From the data, it is observed that subjects who have siblings account for more than 75% [6, 7]. There was a total of 70.66% subjects who had an exposure of passive smoking and there were 29.33% subjects who did not have any exposure to passive smoking. Among the subjects with acute otitis media, 67.27% had an exposure to passive smoking, and 32.72% had no exposure to passive smoking. From the subjects with chronic otitis media80% had an exposure to passive smoking, and 20% had no exposure to passive smoking [8, 9]. Among the subjects with acute otitis media, there were 3.63% subjects belonging to socioeconomic class I, 9.09% belonging to socioeconomic class II, 14.54% belonging to socioeconomic class III, 21.81% belonging to socioeconomic class IV, 50.90% belonging to socioeconomic class V. Among the subjects with chronic otitis media, there was no subject belonging to socioeconomic class I, 15% belonging to socioeconomic class II, 15% belonging to socioeconomic class III, 50% belonging to socioeconomic class IV, 30% belonging to socioeconomic class V [10]. There was a total of 40% subjects who were exclusively breastfed and 60% who were not exclusively breastfed. Among the subjects with acute otitis media, 34.54% were exclusively breastfed and 65.45% were not exclusively breastfed. Among the subjects with chronic otitis media, 55% were exclusively breastfed and 45% were not exclusively breastfed [11, 12]. There were 77.33% subjects who had ear pain, of which 87.27 % subjects were from acute otitis media and 50% subjects from chronic otitis media. There were 40% subjects who had ear discharge, of which 25.45% subjects were from acute otitis media and 80% subjects from chronic otitis media. There were 49.33% subjects who had fever of were 40% who had cough & cold, of which 37 67.27% subjects were from acute otitis media and 55% subjects from chronic otitis media. There were 16% subjects who had irritability of which 14.54% subjects were from acute otitis media and 20% subjects from chronic otitis media. There were 10.66% subjects who had hard of hearing, of which 7.27% subjects were from acute otitis media and 20% subjects from chronic otitis media. There were 22.66% subjects who had pulling of the ear, of which 21.81% subjects were from acute otitis media and 25% subjects from chronic otitis media [13, 14]. Erythema TM was observed in 69.33% subjects, of which 70.91% subjects were from acute otitis media and 65% subjects were from chronic otitis media. otorrhea was observed in 58.66% subjects, of which 49.09% subjects were with acute otitis media and 85% subjects were with chronic otitis media. Perforation was observed in 38.66% subjects, of which 20% subjects were with acute otitis media and 90% subjects were with chronic otitis media. Bulging TM was observed in 9.7% subjects, of which 7.27% subjects were with acute otitis media and 15% subjects were with chronic otitis media. Hearing

loss was observed in 6.66% subjects, of which 3.63% subjects were with acute otitis media and 15% subjects were with chronic otitis media. Otitis externa was observed in 20% subjects, of which 16.36% subjects were with acute otitis media and 30% subjects were with chronic otitis media [15, 16]. In subjects with acute otitis media, there was no growth reported in 65.45% subjects and in chronic otitis media there was no growth in 50% subjects. Staphylococcus were reported in 16% subjects, of which 16.36% subjects were from acute otitis media and 15% subjects were from chronic otitis media. Psuedomonas were reported in 13.33% subjects, of which 9.09% subjects were from acute otitis media and 9.09% subjects were from chronic otitis media. Klebsiella were reported in 4% subjects, of which 3.63% subjects were from acute otitis media and 1 5% subjects were from chronic otitis media. CONS were reported in 10.6% subjects, of which 5.45% subjects were from acute otitis media 5% subjects were from chronic otitis media [17, 18 & 19].

## CONCLUSION

Otitis Media is one of the most prevalent illnesses in young children around the world. Each year, otitis media continues to cause issues for millions of children around the world. To ensure quick diagnosis and treatment and significantly lower the likelihood of consequences, a high index of suspicion is needed. The risk factors include male gender, socioeconomic class, bad habits, exclusive breast feeding, passive smoking etc. Otitis media can cause consequences including speech, language, and cognitive delay. Physicians should be more aware of the presence of these risk factors in their subjects and consider these risk factors when making a diagnosis and prescribing a course of treatment. Otitis media usually involves both the ears with symptomatic discomfort like ear pain, otorrhea, perforation, etc. preventive strategies such pneumococcal vaccination. Additionally, avoiding these risk factors should be a priority when implementing guidelines, especially for kids under the age of six years.

**Conflict Of Interest and Financial Support** – NIL

The study was approved and ethical clearance taken from the Ethics committee, Sri Siddhartha Medical College, Tumkur, Karnataka.

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