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RESEARCH ARTICLE

STUDY OF THE ROLE OF ANTIBIOTICS IN TREATMENT OF SECRETORY OTITIS MEDIA (SOM) IN CHILDREN OF 2-12 YEARS AGE GROUP IN AN ACCREDITED TEACHING HOSPITAL OF SOUTH EAST ASIA

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ABSTRACT

Introduction: Secretory Otitis Media (SOM) is the commonest clinical condition that can cause conductive deafness, especially among school going children. The outcome of hearing loss in children, include, speech problems, behavioral problems, and poor academic performance. Management of SOM therefore remains crucial. Here, comparative study between antibiotics Vs surgical therapy in treatment of SOM has been done.

Materials and Methods: The study was started with enrolling fifty patients. A detailed history with ENT examinations was done and documented in a validated proforma. Routine investigations like CBC, urine examination, audiological investigation like impedance audiometry etc., was done in all cases.

Observation and results: About 70% of the patients presented with symptoms of ear block with mouth breathing. Increased incidence was found in the 2-6 years of age group. The study shows that, surgery can fasten the rate of recovery, shorten the duration of therapy, and prevent the recurrence of SOM as compared to treatment with antibiotics.

Conclusion: However, both the treatments have complications associated with them. Large, well-controlled studies could help resolve the risk benefit ratio by measuring SOM recurrence, functional outcome, quality of life and long term outcomes.

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INTRODUCTION

SOM is a clinical condition characterized by presence of fluid in the middle ear resulting in conductive deafness (Kashyap, 2003). It is the commonest cause of deafness in the school going children. Management of SOM therefore remains challenging and controversial (Kashyap, 2003). Medical management of Otitis Media is actively debated in medical literature primarily due to drug resistant S. Pneumoniae and beta-lactamase producing H. influenza (Taneja and Taneja, 2014). Therefore, surgical intervention (myringtomy with grommet insertion ± adenoidectomy) remains mainstay of treatment. The study's objective was to compare the relative effectiveness of treatment options (antibiotics Vs surgical strategies) in patients with SOM of 2 – 12 years' age group.

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Aim of the study

Any factor that causes obstruction of eustachian tube and causes hypoventilation of middle ear may cause SOM. It is known that loss of hearing may cause impairment of physical and mental development of a child. So, it is utmost important that this condition should be properly diagnosed and treated. So, the aim of this study was to investigate the effect of antibiotics in school children suffering from suppurative otitis media.

MATERIALS AND METHODS

The present study enrolled 50 cases of SOM (more than 3 episodes/year) both, INDOOR and OUTDOOR patients in the department of ENT at MGIMS, Sewagram, Wardha, India, from January 2013 to January 2016. A detailed history with ENT examinations was done and documented in a validated

proforma. Routine investigations like CBC, urine examination, audiological investigation like impedance audiometry etc., was done in all cases. We divided the patient in to two groups.

1. Group I was treated with antibiotics, decongestive nasal drops along with anti-inflammatory drugs.
2. Group II was posted for surgery (myringotomy with grommet insertion with or without adenoidectomy along with decongestive nasal drops. Patients who underwent surgery were followed up at regular intervals of 6 weeks and thereafter 3 months.

Inclusion Criteria

1. Children 2-12 years of age.
2. Confirmation of persistent SOM.

Exclusion Criteria

1. Children more than 12 years of age.
2. Children with conductive hearing loss of more than 40 dB.
3. Children with sensory neural hearing loss or mixed hearing loss.
4. Children with active otitis externa.

RESULTS

All children were discharged on next day of surgery and were asked for regular follow up. During follow up improvement of symptoms and signs and hearing were assessed by using otoscope and tympanometry.

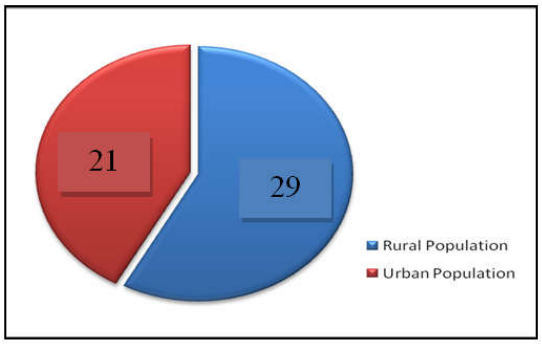


Figure 1. Ratio of rural and urban population of study

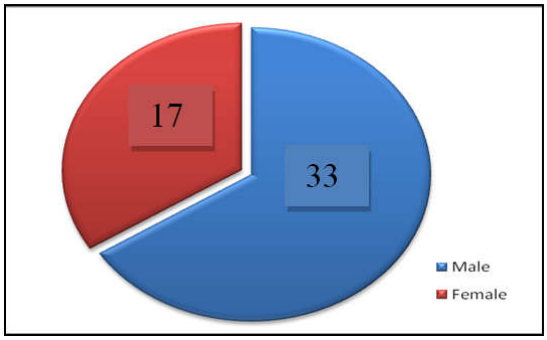
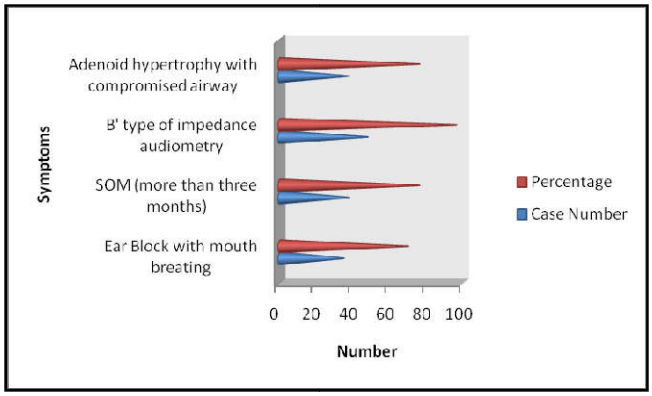


Figure 2. Distribution of male and female children in this study

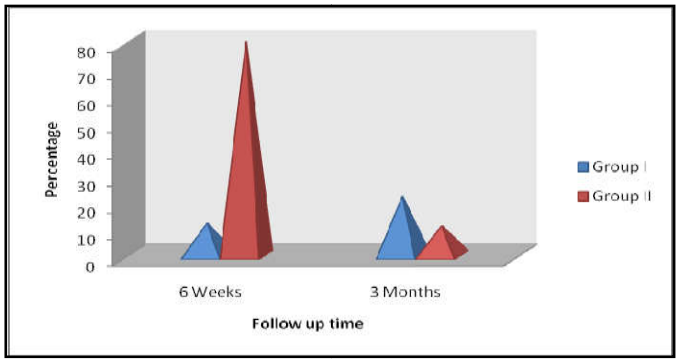
The present clinical study of 50 cases about 29 was from rural population and 21 were from urban population (Figure I). It included 33 male and 17 females (Figure II). The youngest patient in this sample was 2 years and oldest patient was 12 years of age. About 70% of the patients presented with symptoms of ear block with mouth breathing. Increased incidence was found in the 2-6 years of age group. 75% patients presented with more than 3 episodes per year, 95% of patients showed 'B' type of flat curve of impedance audiometry and 70% of patients showed adenoid hypertrophy on lateral view x-ray of nasopharynx with compromised airway (Graph 1).



Graph 1. Symptoms of study groups

As per proforma a through history was taken. All patients were subjected to general and systemic physical examination mainly to find out fitness of surgery. Local examination of ENT was done to rule out neighboring infective foci or associated condition. A clinical diagnosis was arrived after impedance audiometry. Statistics were collected for observation and inferences were drawn.

1. Distribution among the study group.
2. Pre-operative impedance curve.
3. Post operative impedance curve (at 6 weeks and 3 months of follow up).
4. Impedance curve after giving antibiotics in patients (at 6 weeks and 3 months).



Graph 2. Percentage 'A' type of curve in both groups after treatment follow up

In the study, 50% patients were treated with antibiotics and 50% of patients underwent surgery i.e. myringotomy with grommet insertion and adenoidectomy (if required). In the antibiotics group I (who were treated with amoxycillin according to body wt for 4 weeks) only 12 % patient showed 'A' type of curve at 6 weeks, 22% showed 'A' type of curve at 3 months (Graph. 2). On the other hand, group second, 80% patients showed 'A' type of curve at 6 weeks of follow up after surgery. 11% patients showed 'A' type of curve at 3 months follow up after surgery (Graph. 2).

DISCUSSION

SOM is an insidious condition characterized by accumulation of non-purulent effusion in the middle ear cleft (Kashyap, 2003). The fluid is nearly sterile and commonly seen in school going children. Two main mechanisms are thought to be responsible.

1. Malfunction of Eustachian tube.
2. Increase secretory activity of middle ear mucosa.

Impedance audiometry is an objective test useful to diagnose SOM especially for infants and children. Presence of fluid in the middle ear is indicated by reduced compliance and normal 'A' type curve will be replaced by that 'B' type of curve in impedance audiometry. The main aim of treatment is removal of fluid and prevention of its recurrence (Dai *et al*., 2008). Antibiotics are useful in case of URTI (upper respiratory tract infection) or unresolved ASOM (acute suppurative otitis media) (Little *et al*., 2014). Amoxicillin is antibiotic of choice unless the child received it within 30 days. Dose used for empiric treatment from 40-45 mg/kg/day for 10 days. The following crucial issue in SOM treatment was not clearly addressed by CDC (Centers for Disease Control and Prevention) recommendation (Ibia *et al*., 2005).

I. Patient compliance, associate factors of dosing frequency, duration of the therapy, palatability, and cost (Ibia *et al*., 2005).
II. Guidance of special situations (e.g. Allergic to penicillin, betalactam drug) not clear.

Sex incidence in the present series showed slightly male predominance. The study patients (between 2-12 years' age group) who have history of SOM (more than three episodes/years) were randomly divided in to two groups. One group is posted for surgery (myringotomy with grommet insertion with or without adenoidectomy) and amoxicillin is prescribed for another group. This study it is observed that antibiotic has potentially serious side effect such as an increased antibiotic resistance (Fair and Tor, 2014). The cost of antibiotic has also risen (Andersson and Levin, 1999). Antibiotic treatment did not improve the rate of recovery of patient of SOM. On the other hand, surgery, can accelerate the rate of recovery, shorten duration of therapy and prevent the recurrence of SOM (Sedlmaier *et al*., 2002). But patient often required repeated surgery or long action grommet insertion, that may cause permanent damage of tympanic membrane, otorrhea and other complications (Chole and Sudhoff, 1998). Children with Down's syndrome often exhibit eustachian tube dysfunction, external auditory canal stenosis and sensory neural hearing loss. The subtle immunologic deficiency disease conditions create a high risk for surgery of SOM (Kong and Coates, 2009). Adenoidectomy can also increase risk of post surgical hemorrhage (Windfuhr *et al*., 2005). But the outcome of surgery is far better than treatment with antibiotics in children with SOM.

Conclusion

The present study presents a clinical profile of the incidence and probable audiological presentations with role of surgery in its management. There was an increased incidence in the rural population which account for low socio-economic status, poor hygiene, and poor nutritional status. So, this study shows that children suffering from frequent SOM (more than 3 episodes/ year), will be more benefited by surgery (myringotomy) with grommet insertion with or without adenoidectomy compared to antibiotics therapy. It also shows that only antibiotics are not very effective in treatment of SOM in school going children.

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