

# A Comparison of Medical Treatment versus Surgical Treatment for the Management of Otitis Media with Effusion

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**Aims and objectives:** This study is designed: To assess outcome of the two modes of treatment (medical and surgical) of otitis media with effusion in terms of their effectiveness and patient compliance, and to compare in terms of side effects and complications. **Sample size:** Forty patients who fulfilled the inclusion criteria included in the study. They were divided into two groups by random allocation of medical or surgical mode of treatment. Thus each group consisted of twenty patients. **Study setting:** The study was conducted in the Department of ENT Jinnah Hospital, Lahore. **Results:** In Medically Treated Twenty patients effusion did not resolve in most of the cases, and recovered after some time during the follow-up period. In remaining twenty patients treated surgically, there was immediate improvement in hearing in most of the patients. **Conclusion:** Complications rate is more in surgical treatment as compared to medical treatment. But in spite of this, surgical treatment is better option in our set-up regarding effectiveness and patient compliance.

**Keywords:** Otitis Media with effusion (OME), Myringotomy, Grommet.

Secretory Otitis Media is 'the presence of non-suppurative fluid within the middle ear cavity behind an intact eardrum'. Different names have been suggested for this condition including catarrhal otitis media, exudative otitis media, serous otitis media, seromucinous otitis media, non-suppurative otitis media and glue ear, but now otitis media with effusion (OME) is the most recommended term.

Otitis media with effusion is more common in children having peak incidence between the age of 2 to 8 years. It is one of the leading causes of conductive deafness in children and if it persists for long time it may interfere with development of speech and language<sup>1</sup>. This disease may be diagnosed coincidentally during ear examination. A child may complain of mild hearing loss or a feeling of fullness in the ear. The fluid in the middle ear often goes unchecked for weeks to months. Otitis media with effusion is more common in those suffering from chronic recurrent upper respiratory tract infections. Children are more prone to develop this disease due to their weak immune system, poor hygiene and relatively shorter, wider and more horizontal eustachian tubes. It is more common in lower socioeconomic group and during winter months<sup>2</sup>. The duration of otitis media with effusion is variable. Usually it resolves within two months in 75% of children. About 90 % will have the fluid resolved within three months<sup>3</sup>.

There are different modes of management of otitis media with effusion. It has a high rate of spontaneous resolution and a policy of 'wait and see' for three months is justified<sup>4</sup>. General measures for improving hygiene such as feeding, can help in the reduction of this disease. Any source of infection in the upper respiratory tract is eradicated. Use of decongestants and antihistamines for a few weeks is usually indicated during 'wait and see' period. Use of such medication is decided in each patient individually on the basis of history and ENT examination. Serial hearing assessments with audiometry and

tympanometry are conducted in every patient. In spite of all care and medication if fluid persists after 3 months, some surgical intervention is indicated. Surgery is conducted earlier in children with cleft palate, immunity problems or language delays. The purpose of this study is to assess the outcome of different modes of management of OME and to evaluate the best way of treatment of this disease in our circumstances.

## Material and method:

Forty patients who fulfilled the inclusion criteria were included in the study. They were divided into two groups A and B. 'A' for Medical Treatment and 'B' for Surgical Treatment. Thus each group consisted of twenty patient.

A detailed history was taken and thorough clinical examination was done. In addition to general physical examination, examination of ears, nose, throat, cranial nerves and neck was done. The examination of the middle ear included inspection of tympanic membrane with ear speculum, pneumatic otoscope and with ENT microscope. Tuning fork tests (Rinne's test and Weber's test) were done. Laboratory investigation included complete blood count, haemoglobin, ESR, urine analysis, bleeding time, prothrombin time, partial thromboplastin time and platelet count. Radiological examination of paranasal sinuses and postnasal space was done depending on clinical presentation. Impedance audiometry (tympanometry) and pure tone audiometry were done to confirm presence of fluid in the middle ear cavity and conductive hearing loss respectively.

## Results:

Most of the cases (70%) included in this study were 2-8 years of age. A few (10%) were above 12 years and only one case (5%) was below 2 years of age in each group.

In group A, 11 cases (55%) were males, while there were 12 (60%) males in group B. Nine cases (45%) in group A and 8 cases (40%) in group B were female.

History of upper respiratory tract infection was positive in 13 (65%) cases in group A, while 8 (40%) cases in Group B had such history. Enlarge adenoids were found in 3 (15%) cases in Group A and in 9 (45%) cases in Group B. Two cases (10%) in each group had enlarged tonsils. Two cases of allergic rhinitis in group A and one case (5%) of cleft palate was found in Group B.

Presenting Complaints (Table-I) Among 40 cases examined, 16 (80%) cases in Group A and 17 (85%) cases in Group B.

Table I: Presenting complaints (n=20)

Complaints	No. of cases in Group A	No. of Cases in Group B
Hearing Loss	16 (80%)	17 (85%)
Earache	1 (5%)	1 (5%)
Tinnits	1 (5%)	0 (0%)
Nasal Obstruction	2 (10%)	2 (10%)

Came with the complaint of hearing loss. Nasal obstruction was the presenting complaint in 2 cases (10%) each in Group A and Group B. One patient (10%) in each group complained of earache.

Change of color (loss of translucency) of TM was found in 16 cases (80%) in Group A and in 14 (70%) cases in Group B. signs of retraction of TM were seen in 13 (65%) cases in Group A and in 14 (70%) cases in Group B. In 15 (75%) cases in Group A mobility of TM was impaired while 17 (85%) cases in group B had impaired mobility. Six cases (30%) in Group A had fluid level behind TM while they were seen in 5 (10%) cases in Group B. It is evident that more than one sign was present in each patient.

Tuning fork tests were performed on patients having age more than 4 (Four) years Rinne's test was negative in 57.5% of ears and it was positive in only 12.5%. It means majority of cases had conductive hearing loss.

Type B tympanograms were obtained on impedance audiometry (tympanometry) in all cases included in this study. Type B tympanogram (flat trace without a compliance maximum) indicates fluid in the middle ear cavity. It is a hallmark of OME. The diagnosis of the disease mainly depended on the basis of otoscopy examination and tympanometry results. On pure tone audiometry (PTA) before treatment, the majority of cases (57.5%) had hearing loss 25-35 dB.

The fluid evacuated from middle ear during surgery was mucoid in most of the cases (60%). Due to this thick glue-like fluid the disease is sometimes called "glue ear". No fluid was recovered on myringotomy in 10% of cases in spite of strong evidence on otoscopy and tympanometry. This is well recognized phenomena in various studies conducted. The reason for this is not clear, but it could be

as displacement or effervescent effect of nitrous oxide gas in the middle ear Position and pressure variation effect causing drainage of fluid in the middle ear has also been noticed.

The management of OME of medical treatment in 50% of cases (Group A) and some surgical intervention in rest of them (Group B). The medical treatment included antibiotics, systemic decongestants with systemic Antihistamines and topical steroid in form of nasal drops. Systemic antibiotic used in 40%. Systemic decongestant with systemic antihistamines in 50% and topical steroid with antihistamines in remaining 10% (Table-II).

Table II: Distribution of medical treatment Group A (n=20)

	=n	%age
Systemic antibiotics	8	40
Systemic decongestants with systemic antihistamines	10	50
Topical steroids + antihistamines	2	10

Among surgical interventions Myringotomy with grommet insertion was the main surgical procedure performed. It was done alone (30%) or combined with adenoidectomy (25%) or adeno-tonsillectomy (10%). Myringotomy with Adenidectomy in 20% and Myringotomy alone in 15% (Table-III).

The hearing gain two weeks after surgery was remarkable (>25 dB) in the majority (80%) of cases (Table-V). As compared to Medical Treatment i.e. 40% after 2-weeks (Table-IV). At follow up 6 months after surgery, the number of patients with hearing gain more than 25 dB decreased to 65%. The reason for this was extrusion of grommets prematurely in two cases as compared to medical Treatment increase to 55%. Myringotomy alone was done in three cases (15%), immediate post-operative effect was good on hearing but all the patients reported with relapse within one month due to early closure of myringotomy incision.

Table III: Distribution of surgical interventions Group B (n=20)

	=n	%age
Grommet insertion + myringotomy	6	30
Myringotomy grommet insertion + adenoidectomy	5	25
Myringotomy adenoidectomy	4	20
Myringotomy alone	3	15
Myringotomy + grommet insertion + adenotonsillectomy	2	10

Table-IV: Hearing gain after medical treatment Group A (n=20)

Follow up	Hearing gain>10 dB	Hearing gain>10-25 dB	Hearing gain>25 dB
After 2 weeks	2 (10%)	10 (50%)	8 (40%)
After 6 weeks	0 (0%)	8 (40%)	12 (60%)
After 6 months	2 (10%)	7 (35%)	11 (55%)
After one year	1 (5%)	9 (45%)	10 (50%)

Table V: Hearing gain after surgery Group B (n=20)

Follow up	0-10 dB	10-25 dB	>25 dB
After 2 weeks	1 (5%)	3 (15%)	16 (80%)
After 6 weeks	2 (10%)	4 (20%)	14 (70%)
After 6 weeks	1 (5%)	6 (30%)	13 (65%)
After one year	2 (10%)	9 (50%)	9 (50%)

Maringotomy combined with adenoidectomy in four (20%) had much better results than myringotomy alone. Cleft palate in one case was repaired in addition to doing myringotomy.

A number of patients were found to have complications (Table-VI). Tympanosclerosis was the most frequent complication which occurred more (15%) in group B (treated surgically) as compared with 5% in group A (treated medically). During follow up chronic Suppurative Otitis Media (CSOM) and perforation were found more (15%) in surgically treated patients as compared with those treated medically (5%). In the same way otitis externa was more common (10%) among surgically treated patients. Eardrum atrophy, cicatrization and attic retractions had almost similar frequency in both groups. In the present study we noted that improvement of hearing was more after surgical interventions as compared with medical treatment. Medical treatment was more successful if the patients reported earlier. The complications were more with surgical interventions as compared with medical treatment.

Table-VI Complications (n=20)

Complication	No of cases in Group A	No. of Cases in Group B
Tympanosclerosis	1 (5%)	3 (15%)
Otitis Externa	0 (0%)	2 (10%)
Suppuration, Perforation	1 (5%)	3 (15%)
Atropy, Cicatrization	2 (10%)	1 (5%)
Attic retractions	2 (10%)	1 (5%)
No Complications	14 (70%)	10 (50%)

**Discussion:**

The disease was described in a comprehensive way for the first time by Politzer in 1869, though a couple of workers had recognized OME earlier. Hilton, in 1874, gave the otoscopic appearance of the disease: Different people gave the disease different names depending on the etiology and types of fluid in the middle ear cavity. Aspiration of the middle ear effusion for the purpose of diagnosis was done and recommended for the first time by Hoople in 1950. In the recent past, there has been higher incidence of the disease which may be apparent rather than real perhaps because of better available diagnostic tools like tympanometry, hearing assessment techniques and otomicroscopy. It may also be due to increased awareness of parents about the hearing difficulties in childhood. There was no definite treatment of Chronic cases of OME till 1954 when Armstrong brought a revolution in the

management of the disease by successful insertion of grommet. There have been different associated surgical interventions in addition to grommet insertion, but the confusion about the best way of treating OME still persists. Medical treatment of the disease also continued<sup>5</sup>. The comparison of natural history of the disease and complications of surgery has led many otologists to think surgery as an assault on the eardrum. That is why search for a suitable way of treatment of OME is going on and this study is a continuation of the same research.

OME is very common condition. However, its precise epidemiology is poorly documented. According to a recent study 3-8% of all children between 1-7 years of age are diagnosed with OME<sup>6,7</sup>. The incident of this disease reaches its maximum at five years of age. The disease is more common in boys than girls. There has been increased incidence of OME in the recent past all over the world, though it may be apparent rather than real, and may be due to improved otological services for children and more accurate tests now available resulting in earlier diagnosis, and it may also be due to increased awareness of parents about the hearing difficulties during childhood. Different studies give different figures about incidence and prevalence of OME in different populations and age groups. In one regional study done in Karachi in a screening program, ears of 2200 school-going children were tested by tympanometry in the years 1988 to 2000. Among them 213 children had abnormal compliance, showing 9.68% prevalence of the disease in school-going children in Karachi in that particular period<sup>8</sup>. The incidence of OME is more in winter, with a peak in January, February, March and April while it is low in summer months<sup>9</sup>. The disease is more common in Eskimos and red Indians, and the black children have lower incidence than the whites. Children whose parents or siblings had OME are more at risk of getting it. The disease is more common in children belonging to lower socioeconomic group of population<sup>10</sup>. OME is more common in children living in urban than the rural areas. It is more common among children who are kept in day-care centers and in those who are bottle-fed babies. Early weaning also decreases the incidence of OME at the Highlands of Himalayas<sup>11</sup>.

Otitis media with effusion is one of the commonest ear disease of children. Most of the children or parents complain of hearing loss. Some present late with delayed development of speech and disturbance of the intellectual milestones. As spontaneous resolution occurs in majority of cases, a policy of 'wait and see' is justified.<sup>3(a)</sup> But in our study most of the patients presented late with relatively long standing symptoms. They were treated either with medicines (Group A) or surgically (Group B). Medically treated patients did not respond well as compared to surgically treated patients, there was immediate response. So, surgical treatment is better option in our circumstances.

**Conclusion:**

OME is one of the common disorders of early childhood causing hearing loss and delay in speech development and intellectual milestones. Its etiology and pathogenesis is multifactorial. Surgical treatment of OME is very effective but has relatively more complications. Majority of the patients get benefit from 'wait and see' policy and/or medical treatment. Those who fail to respond to medical treatment or present late need surgical intervention. Surgical treatment consists of myringotomy / grommet insertion with or without adenoidectomy/tonsillectomy. As compared with surgical management, medical treatment of OME is safe with few complications, but it is less effective in our setup due to late presentation. A screening programme is recommended for earlier diagnosis of the disease in children. In early diagnosed cases "wait & see" with early medical treatment becomes effective. Moreover, early diagnosis and timely treatment will help avoiding delay in development of speech and language. Many of the certain facts like chronic / recurrent infection and allergy are avoidable many fold.

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