

*Research Article***Type of Fluid in Middle Ear Effusion, is it Serous or Mucoïd?****Ahmed A. Abdel-Aziz**

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Abstract

About 90% children in preschool age have middle ear effusion. (2) Fluid accumulates in the middle ear may be serous or mucoïd. This study aims to evaluate the type of fluid in middle ear effusion and study if there is a relation between it and data obtained from history, operative notes and investigations of patients. **Patients and methods:** A retrospective study based on analysis of data (history, operative notes, and investigation) of 225 patients who were undergone myringotomy with insertion of ventilation tubes in the period from February 2018 to January 2020 to detect If the patient is asthmatic or allergic rhinitis or both ,preoperative medication ,degree of hearing from audiogram And Type of fluid in the middle ear. **Results:** There were 83 (36.9%) males and 142(63.1%) females. In 100(44.4%) patients, type of fluid in middle ear was glue while serous in 125(55.6%) patients. 24(10.7%) patients were asthmatic while 63(28%) patients were allergic rhinitis. 85(37.8%) patients received systemic antihistaminic/decongestant drugs. There is a significant positive correlation (+R) between glue and each allergic rhinitis. **Conclusion:** Antihistaminic/ decongestant drug is correlated with mucoïd middle ear effusion ,so it's better to avoid it as a line of treatment of middle ear effusion. Moderate hearing loss is correlated with mucoïd ear effusion, so audiometry in follow-up of patients with MEE is very important and may change the opinion of conservative treatment to surgical treatment.

Keywords: middle ear effusion, otitis media, moderate conductive hearing loss**Introduction**

Middle ear effusion is defined as the presence of fluid in the middle ear behind an intact tympanic membrane without any signs or symptoms of acute infection.⁽¹⁾ About 90% children in preschool age have middle ear effusion.⁽²⁾ Fluid accumulates in the middle ear may be serous or mucoïd.⁽³⁾ The major causes of middle ear effusion are either a mucociliary system dysfunction of the middle ear or Eustachian tube dysfunction(E T) or both.⁽⁴⁾ This study aims to evaluate the type of fluid in middle ear effusion (MEE) and study if there is a relation between it and data obtained from history, operative notes and investigations of patients.

Patients and methods

A retrospective study based on analysis of data(history, operative notes, and investigations) of patients who were undergone myringotomy with insertion of ventilation tubes in the period from February 2018 to January 2020 to detect a

- If the patient is asthmatic or allergic rhinitis or both
- Preoperative medication
- Degree of hearing from audiogram
- Type of fluid in the middle ear.

The study was approved by Minia Faculty of Medicine International Review Board.

Statistical analysis

Results were expressed as number (%) or mean. Comparison between variables data was performed using the correlation test. The main result of a correlation is correlation coefficient (**R**), which ranges from - 0.1. to +1. If both variables tend to increase or decrease together the coefficient is positive. If one variables tends to increase and the other decrease the coefficient is negative. The closer **R** is to +1 or - 1 the more closely the 2 variables are related. Statistical analysis was performed with SPSS computer program (version 22).

Results

Table1 show Number of cases with mucoid and serous effusion

Patients condition	Number of patients with mucoid effusion	Number of patients with serous effusion
Asthma	4	1
Asthma and allergic rhinitis	9	1
Asthma and allergic rhinitis and preoperative A/H drug	6	Zero
Asthma and preoperative A/D drug	3	Zero
Allergic rhinitis and preoperative A/D drug	25	2
Allergic rhinitis	15	5
A/D drug	20	2
Not asthmatic /not allergic rhinitis/No preoperative A/H drug	18	114

225 patients with bilateral middle ear effusion were included in this study. Ages ranged from 2-10 years with a mean 5.21 ± 2.5 . There were 83 (36.9%) males and 142(63.1%) females. all 225 patients received preoperative medical treatment in the form of antibiotics (3rd generation cephalosporin as the first line of treatment, amoxicillin-clavulanic acid as a second line of treatment, mucolytic and systemic corticosteroids) but only 58 patients receive combined (decongestant-antihistaminic 1st generation). In 100(44.4%) patients, type of fluid in middle ear was glue while serous in 125(55.6%) patients. 24(10.7%) patients were asthmatic while 63(28%) patients were allergic rhinitis. 85(37.8%) patients received systemic antihistaminic/decongestant (A/D) drugs. There is a significant positive correlation (+R) between glue and each allergic rhinitis, asthma, and antihistaminic/decongestant drug. Correlation is low positive in correlation between asthma and mucoid effusion while correlation is moderate positive either between allergic rhinitis and mucoid effusion or antihistaminic/decongestant drugs and mucoid effusion.

Discussion

Middle ear effusion is serous at first then becomes mucoid due to metaplasia of middle

ear mucosa with increase gobbed cells ,this may be caused by the long-standing of the middle ear effusion or due to other causes or predisposing factors.⁽⁵⁾ In this study, all 225 patients received preoperative medical treatment in the form of antibiotics (3rd generation cephalosporin as the first line of treatment, amoxicillin-clavulanic acid as a second line of treatment, mucolytic and systemic corticosteroids) but only 58 patients receive combined (decongestant-antihistaminic 1st generation) in addition to previous treatment. 54 patients out of 58 patients (receive combined A/D drug) had mucoid effusion with a significant positive correlation and only 4 patients had serious effusion. The use of decongestant /antihistaminic drug in the treatment of MEE is controversial. Some authors found no benefit from using it, but only side effects.⁽⁶⁾ others found it useful as the antihistaminic reduces allergic elements in the middle ear and the decongestant results in shrinkage of the mucosa of the middle ear with improvement of eustachian tube patency.⁽⁷⁾ Asthmatic patients have a high incidence to develop MEE with mucoid effusion (This may be due to affection to the mucociliary system of the middle ear as that of the respiratory system. Some authors found that good treatment of asthma improves middle ear

effusion.⁽⁸⁾ In this study 24 patients were asthmatic and 22 had mucoid effusion and 2 patients had serous effusion. Despite 24 patients receiving their treatment for asthma with good control of it, MEE has not resolved and patients need surgery. The pathogenesis of MEE is multifactorial. Many studies have shown a correlation between allergic rhinitis and the development of MEE.⁽⁹⁾ Many studies have shown that allergic rhinitis play a role in the pathogenesis of MEE.⁽¹⁰⁾ But there is no evidence either for causation or for change of prognosis of MEE after treatment of nasal allergy.⁽¹⁾ Many mechanisms may explain the correlation between nasal allergy and MEE. Nasal allergy can obstruct the nasal airway with an increase of negative pressure in the nasopharynx and this affects the patency of the Eustachian tube (ET). Also, edema of the nasal mucosa may extend to the nasopharynx and to (ET) orifices. Another mechanism, the allergenic particles may reach the nasopharyngeal orifice of ET and trapped in the mucosa of the middle ear and cause antigen antibodies interaction.⁽¹¹⁾ In this study, 63 patients had allergic rhinitis and 55 of them had mucoid effusion. So, not all cases of allergic rhinitis had mucoid effusion. researchers think that mucoid effusion is due to disturbance of mucociliary clearance. 18 patients who were not asthmatic or allergic rhinitis with no history of preoperative medication of antihistaminic/decongestant drugs had mucoid effusion and this may be explained by long-standing middle ear effusion. Audiometry (pure tone audiometry –ABR-play audiometry) shows mild to moderate conductive hearing loss with mild hearing loss is more frequent.⁽¹²⁾ In this study, 104 patients with moderate hearing loss (HL) and 121 patients with mild H L. The researcher found mucoid effusion in 100 cases out of 104 cases of moderate hearing loss and serous effusion in 125 cases. This means moderate hearing loss is correlated with mucoid effusion while mild hearing loss is correlated with serous effusion. And the four cases of moderate HL with serous effusion may be due to the presence of another pathology associated with effusion as ossicular pathology. So audiometry in follow-up of patients with MEE is very important as in cases of moderate conductive hearing loss, the opinion of conservative treatment may be changed to surgical treatment. As the child with moderate hearing loss has hearing and

communication problems so surgical treatment is more suitable.

Conclusion

Antihistaminic/decongestant drug is correlated with mucoid middle ear effusion ,so it's better to avoid it as a line of treatment of middle ear effusion. Moderate hearing loss is correlated with mucoid ear effusion, so audiometry in follow-up of patients with MEE is very important and may change the opinion of conservative treatment to surgical treatment.

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