ROLE OF HELICOBACTER PYLORI BACTERIA IN OTITIS MEDIA WITH EFFUSION

Meta-analysis for partial fulfillment of master degree in otolaryngology

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2010

بسم الله الرحمن الرحيم

قال رب إشرح لى صدرى (25) ويسر لى أمرى (26) واحلل عقدة من لسانى (27) يفقهوا قولى (28)

صدق الله العظيم

سورة طه (25-28)

Acknowledgment

At first and at the end all thanks should be for my God Allah that the One who really helped me.

I would like to express my deep gratitude to Professor Dr. **Mohamed Zaki Helal** professor of otorhinolaryngology Ain-Shams University, for the encouragement that he generously offered during this work.

Words stand short to express my respect and thanks to Dr. **Mohamed Shehata** for his kindness and cooperation in all steps of this work.

I am also very grateful to Dr. **Ahmed Maher** for his guidance and supervision of this work.

Finally, I would like also to present my thanks to my family.

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INTRODUCTION

Otitis media with effusion

Definition:

Chronic OME is characterized by the persistence of a middle ear effusion for 3 months or more without clinical signs and symptoms of active infection. *(Tasker A et al., 2002)*

Otitis media with effusion (OME) is the commonest cause of hearing difficulty effecting up to 1/3 of preschool children in all world. *(Tasker A et al., 2002)*

OME is associated with behavioral, developmental, and cognitive difficulties in some children, with a risk of difficulties persisting into late childhood and early teens. *(Bennett KE and Haggard MP ., 1999)*

The median hearing loss in children with OME was found to be 25 dB, and a similar level of hearing loss would result from putting plugs in the ears of a normally hearing *child. (Fria TJ et al., 1985)*

Although otitis media with effusion (OME) is such a common disease of childhood, its pathogenesis still remains unsettled. Adenoid tissue, allergy, autoimmunity, gastroesophageal reflux, viral, and bacterial infections are factors that possibly play a role in its pathogenesis. *(Yilmaz T et al., 2006)*

Epidemiology:

Otitis media with effusion has a prevalence of about 20% at around 2 years of age. It remains common up to the age of 7 years at which time the prevalence is between 3% and 8%. OME often resolves spontaneously with a median duration of about 3 months. However about 50% of those recovering will have a further episode of OME. *(Christopher C et al., 2003)*

Pathophysiology:

There is evidence of metaplasia of the middle ear epithelium with a proliferation of goblet cells and mucus glands. This results in hyper secretion of mucus, which the normal mucociliary transport system is unable to clear, leading to the accumulation of a mucin-rich viscous effusion in the middle ear cleft. *(Tasker A et al., 2002)*

Aetiology:

It is not clear why OME develops. Low-grade infection, poor clearance due to poor eustachian tube function, local inflammatory reactions, and adenoidal infection or hypertrophy have all been implicated. *(Bluestone CD et al., 1992)*

Several predisposing factors have been suggested, including eustachian tube dysfunction, allergy, passive smoking, viral upper respiratory tract infections, and adenoidal hypertrophy or adenoiditis. *(Ebmeyer J et al., 2005)*

Younger children get OME more often than older children or adults for several reasons as the tube is shorter, more horizontal, and straighter, making it easier for bacteria to enter, also the tube is floppier, with a tinier opening that's easy to block and young children get more colds because it takes time for the immune system to be able to recognize and ward off cold viruses. *(Ebmeyer J et al., 2005)*

A lot of Viral and bacterial microorganisms have been found in children with OME. Streptococcus pneumoniae accounted for 38% of positive cultures and Haemophilus influenzae accounted for 27% of positive cultures in a large series of bacterial cultures of middle ear fluids. *(Bluestone CD et al., 1992)*

PCR were used to detect other microorganisms like Alloiococcus otitidis, Moraxella catarrhalis and few viruses like human rhinovirus. *(Christopher C et al., 2003)*

Gastroesophageal reflux (GER) is believed to be an important contributing factor in many disorders of the upper respiratory tract: pharyngolaryngitis, croup, oropharyngeal dysphagia, rhinosinuitis, otalgia, and different forms of otitis, among others.*(Rozmanic V et al., 2002)*

Reflux of gastric content from the nasopharynx into the middle ear is, possibly, due to the angle of the immature Eustachian tube, a manifestation of skull anatomy in children. This would cause inflammation of the nasopharynx and Eustachian tube, making pressure equalization difficult and, possibly, inducing Eustachian tube dysfunction. *(Tasker A et al., 2002)*

Symptoms:

OME often does not have obvious symptoms. Older children and adults often complain of muffled hearing or a sense of fullness in the ear. Younger children may turn up the television volume. *(Paradise JL et al., 2007)*

Diagnostic Maneuvers:

The basis of diagnosis is pneumatic otoscopic examination of the ear. This has a fairly high sensitivity and specificity in the hands of experienced clinicians.*(Maw AR and Herod F., 1986)*

(1) A local ear examination by otoscope may show.*(Figure 1,2)*

- Airbubbles
- Dullness
- Fluid behind ear drum
- Reduced movement of ear drum

(2) Audiometric evaluation supports the diagnosis, and the key investigations are conventional pure tone audiometry and/or play audiometry, as well as tympanometry. *(Audiol Br J., 2000)*

Type B tympanogram (normal ear canal volume) usually suggests otitis media with effusion and associated with conductive deafness.*(Figure 3)*

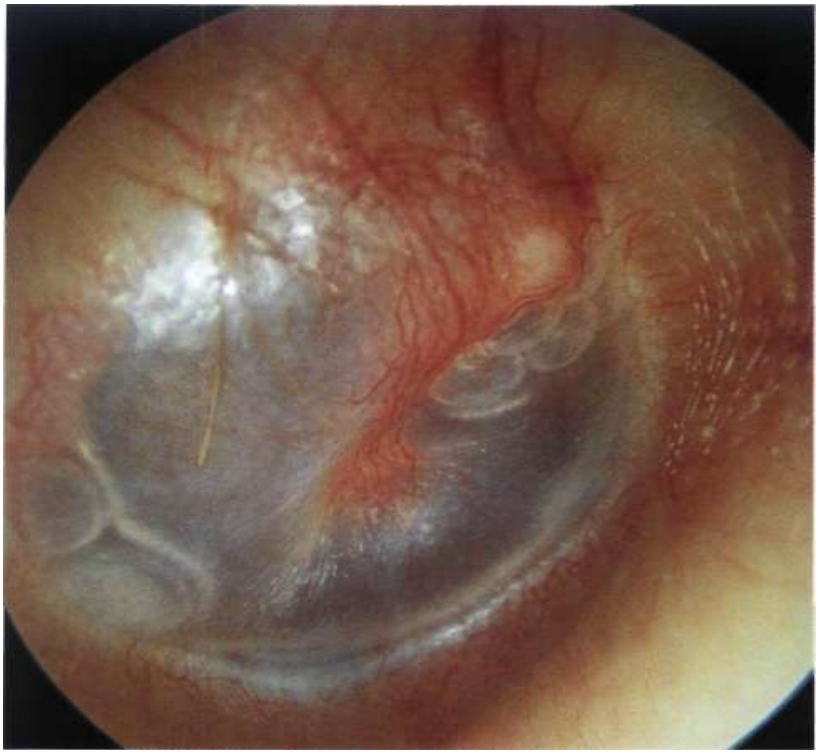


Figure 1;Secretory otitis media with effusion of the right ear as air bubbles can be seen anterior to handle of malleus and also in posterior quadrant.(photo from “Color atlas of otoscopy’ book) page 27.

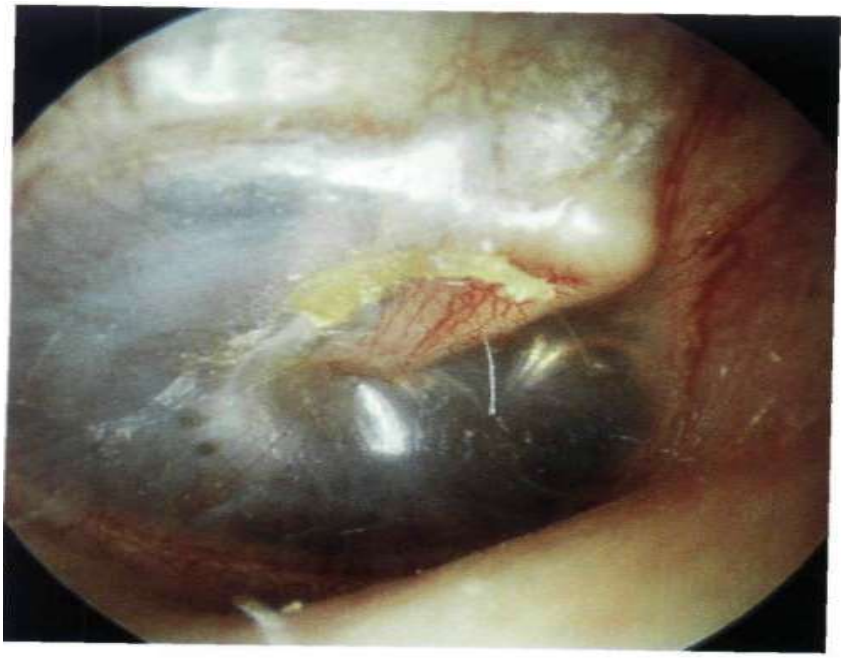
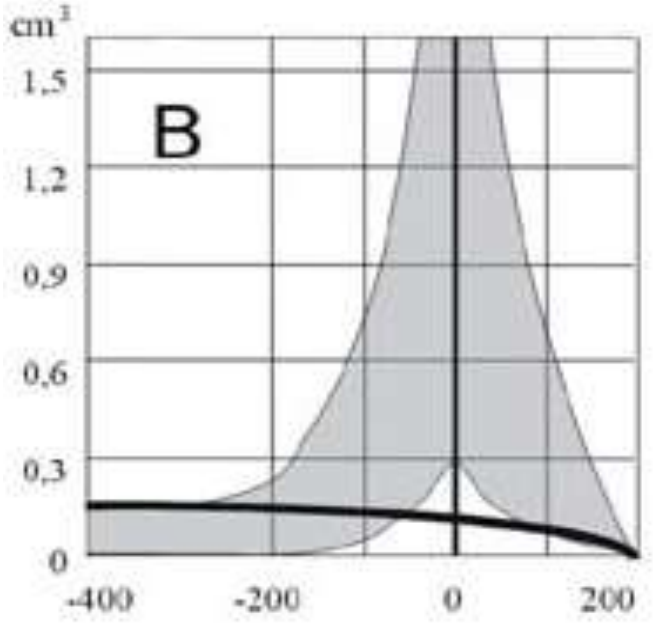


Figure 2;Right ear. Seromucoid effusion in the middle ear. Air bubbles can be seen in the anterior quadrants of the tympanic membrane (glue ear). .(photo from “Color atlas of otoscopy’ book) page 28.

Figure 3; Type B tympanogram (normal ear canal volume) usually suggests otitis media with effusion and associated with conductive deafness.



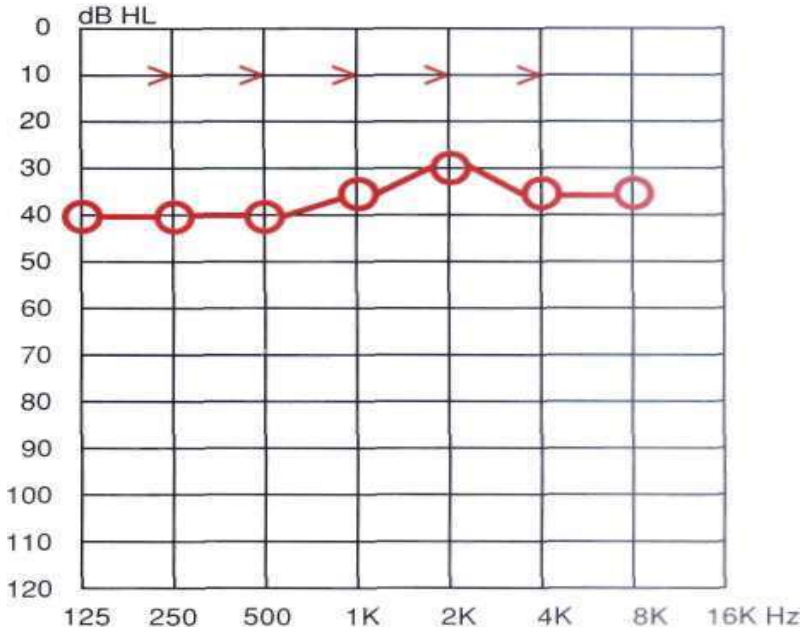


Figure 3; from"Color atlas of otoscopy' book) page 26.

Prognosis:

Otitis media with effusion usually goes away on its own over a few weeks or months. Treatment may speed up this process. Glue ear may not clear as quickly as OME with a thinner effusion. *(Paradise JL et al., 2007)*

OME is usually not life threatening, but it may result in serious complications. If there is fluid in the middle ear, hearing will be affected. Hearing problems can interfere with language development in children. Any fluid that lasts longer than 8-12 weeks is a cause of concern. *(Paradise JL et al., 2007)*

Possible Complications:

- Acute ear infection
- Cyst in the middle ear
- Permanent damage to the ear with partial or complete hearing loss
- Scarring of the eardrum (tympanosclerosis)
- Speech or language delay *(Paradise JL et al., 2007)*

Prevention:

- Avoid irritants such as cigarette smoke, which can interfere with Eustachian tube function.
- Identify and avoid any allergans that may lead to your child's OME.
- Consider a smaller day care, especially in the winter months. Day care centers that have six or fewer children result in fewer ear infections.
- Wash hands and toys frequently.

- Use air filters and get fresh air to help decrease exposure to airborne germs.
- Avoid overusing antibiotics. The overuse of antibiotics breeds increasingly resistant bacteria.
- Breastfeeding for even a few weeks will make a child less prone to ear infections for years.
- The pneumococcal vaccine can prevent infections from the most common cause of acute ear infection (which leads to OME). The flu vaccine can also be of help. *(Paradise JL et al., 2007*)