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*RESEARCH ARTICLE*

# OTITIS MEDIA.

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## Abstract

Acute otitis media and otitis media with effusion are common childhood disorders, a source of significant morbidity, and a leading cause of antibiotic prescription in primary health care. Although effective treatments are available, some shortcomings remain, and thus better treatments would be welcome. Recent discoveries within the field of otitis media research relating to its etiology and pathogenesis have led to further investigation aimed at developing novel treatments. This article provides a review of the latest evidence relating to the understanding of acute otitis media and otitis media with effusion, current treatment strategies, their limitations, new areas of research, and novel strategies for treatment.Middle ear infection (otitis media)



## Introduction:-

Otitis media is an infection of the middle ear that causes inflammation (redness and swelling) and a build-up of fluid behind the eardrum.

Anyone can develop a middle ear infection but infants between six and 15 months old are most commonly affected. It's estimated that around one in every four children experience at least one middle ear infection by the time they're 10 years old.

Otitis media (OM) is one of the primary conditions for which antibiotics are prescribed in the United States.1 Failure to distinguish acute otitis media (AOM) from otitis media with effusion (OME) is a possible reason for the use of antibiotics when they are not indicated, and this may contribute to the development of antibiotic-resistant organisms. Acute OM and OME both are upper respiratory tract infections, but children with AOM also have pain and fever.2 The current recommendation for the treatment of AOM is to use an antibacterial agent (usually amoxicillin).3 Antimicrobial therapy is not recommended for patients with OME because it typically resolves spontaneously.2 Because of the concerns of increasing antibiotic-resistant infections and overuse of antibiotics, other methods for conservative care for the common condition of OME are needed. Methods traditionally associated with complementary and alternative medicine (CAM) are usually conservative and do not include pharmaceutical drugs or surgery. Currently, CAM is not considered a potential treatment of either AOM or OME because of limited evidence in the literature.3,4

In addition to musculoskeletal disorders, both the chiropractic and osteopathic professions have claimed that spinal manipulation therapy (SMT) may alleviate disorders involving visceral organs, such as OME.5,6 Hypotheses regarding how SMT accomplishes this generally attribute the effects of SMT to biomechanical changes produced in the spine, which subsequently mediate changes in sympathetic or parasympathetic nerve activity.5,6

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Certain chiropractic and osteopathic manipulative techniques address the function of cranial structures (including intraoral structures) for treatment of OM.7 These structures may directly affect the Eustachian tube (ET), which is thought to be the primary structure involved in reoccurrence of OM.8 The ET has an increase in goblet cells during and up to at least 6 months after OM regardless of the bacterium causing the condition. Otitis media causes an increased secretory capacity of the ET. This increase may contribute to the excessive mucus and deteriorated ET function. These factors could also predispose the patient to the reoccurrence of OM or to a more aggressive middle ear complication.

Another hypothesis, which also indirectly involves the ET, is the impact of cervical manipulation on the lymphatic and muscular systems. Lymphatic flow requires muscular contractions, arterial pulsations, and external compression of body tissues. It is hypothesized that restricted joint movement within the cervical spine may result in muscle hypertonicity restricting lymphatic drainage away from the cranial region. This hypothesis suggests that cervical SMT reduces tension within hypertonic muscles, thus increasing lymphatic drainage.9.

## Objective:-

Otitis media (OM) is one of the common conditions for doctor visits in the pediatric population. Spinal manipulation therapy (SMT) may be a potential conservative treatment of OM. The purpose of this study is to review the literature for OM in children, outlining the diagnosis of OM, SMT description, and adverse event notation.

The objective of this review was to determine whether antihistamine, decongestant or combination therapy is effective in treating children who present with OME.

The aim of this review was to assess evidence from randomised controlled trials about the effect, on language and behavioural outcomes, of screening and treating children with clinically important OME in the first four years of their life.

The objective is to perform a comprehensive review of the literature from January 2007 through June 2011 on the virology, bacteriology, and immunology related to otitis media.

We examined relationships between otitis media risk factors, sociodemographic characteristics, and maternal knowledge and attitudes and early onset of otitis media.

## Literature Review:-

Otitis media with effusion (OME - also known as 'glue ear') is a common condition in children, where sticky fluid accumulates in the middle ear. Although the fluid usually resolves without treatment, it may remain and cause long periods of hearing loss. This may lead to problems with language development and behaviour. Children with OME may show no other symptoms so some have suggested that all children should be checked (screened) for this condition. However, the review of trials in the developed world found that checking children for, and early treatment of, OME before they are four does not result in improved outcomes.

Otitis media with effusion (OME), also known as glue ear or serous otitis media, is a condition in which there is fluid persisting in the middle ear. Many treatments have been suggested. This review summarizes the studies using antihistamines, decongestants or a combination of antihistamines and decongestants and finds no benefit for any of the short or long-term outcomes including resolution of the fluid, hearing problems or the necessity of additional referral to specialists. Further, using these medications causes significant side effects, such as gastrointestinal upset, irritability, drowsiness or dizziness, in approximately 10% of patients. Therefore antihistamines, decongestants or antihistamine/decongestant combinations are not recommended treatments for OME. Watchful waiting is the best approach with consideration of referral for evaluation by an ENT consultant if symptoms persist beyond 12 weeks.
Evidence-based medicine is an approach to medical treatment intended to optimize patient-oriented decision-making on the basis of empirically proven effectiveness. For this purpose, a classification system has been established to categorize studies – and hence therapy options – in respect of associated evidence according to defined criteria.
The Eustachian tube connects the nasopharynx with the middle ear cavity. Its key function is to ensure middle ear ventilation. Compromised ventilation results in inflammatory middle ear disorders. Numerous evidence-based therapy options are available for the treatment of impaired middle ear ventilation and otitis media, the main therapeutic approach being antibiotic treatment. More recent procedures such as balloon dilation of the Eustachian

tube have also shown initial success but must undergo further evaluation with regard to evidence. There is, as yet, no evidence for some of the other long-established procedures.

Owing to the multitude of variables, the classification of evidence levels for various treatment approaches calls for highly diversified assessment. Numerous evidence-based studies are therefore necessary in order to evaluate the evidence pertaining to existing and future therapy solutions for impaired middle ear ventilation and otitis media. If this need is addressed, a wealth of implications can be expected for therapeutic approaches in the years to come.

Otitis media is the most common infection second only to viral upper respiratory infection in the outpatient setting. Tympanostomy tube insertion (TTI) is the most common ambulatory surgical procedure in the United States. While many risk factors for otitis media have been identified, atopic conditions have been under-recognized as risk factors for recurrent and persistent otitis media. Given that asthma and other atopic conditions are the most common chronic conditions during childhood, it is worth examining the association between atopic conditions and risk of otitis media, which can provide insight into how atopic conditions influence the risk of microbial infections. This paper focuses its discussion on otitis media, however it is important that the association between atopic conditions and risk of otitis media be interpreted in the context of the association of atopic conditions with increased risks of various microbial infections.

Acute otitis media (AOM) is a leading cause of visits to physicians and of antibiotic prescriptions for young children. We systematically reviewed studies on all-cause AOM episodes and physician visits in which impact was attributed to pneumococcal conjugate vaccines, either as efficacy or effectiveness. Of 18 relevant publications found, most used the 7-valent pneumococcal conjugate vaccine (7vCRM). The efficacy of 7vCRM against all-cause AOM episodes or visits was 0%–9% in randomized trials and 17%–23% in nonrandomized trials. In observational database studies, physician visits for AOM were already declining in the 3–5 years before 7vCRM introduction (mean change, −15%; range, +14% to −24%) and continued to decline afterward (mean, −19%; range, +7% to −48%). This vaccine provides some protection against OM, but other factors have also contributed to the recent decline in OM incidence. Future effectiveness studies should thus use better-controlled methods to estimate the true impact of vaccination on AOM.

Otitis media (OM) is amongst the most common childhood diseases and is associated with multiple microbial pathogens within the middle ear. Global and temporal monitoring of predominant bacterial pathogens is important to inform new treatment strategies, vaccine development and to monitor the impact of vaccine implementation to improve progress toward global OM prevention.

Otitis media is caused by viral and/or bacterial infection of the middle ear space and the resulting host response to infection. The microbiology and immunology of otitis media have been the subject of tremendous research efforts over the past 4 years by a large number of researchers throughout the world. This work has resulted in advances in understanding mechanisms of microbial pathogenesis, molecular epidemiology, genomics, identification of new viruses, polymicrobial interactions, and other areas. Work on the immunology of otitis media has resulted in advances in understanding susceptibility to infection and also in elucidating the role of host responses in the pathogenesis of otitis media.

The goal of this panel report is to provide a comprehensive review of research in the virology, bacteriology, and immunology of otitis media over the past 4 years.

Otitis media (OM) affects nearly all preschool children, and onset in the first few months of life predicts later chronic and recurrent OM.1–4 Data from the Indian Health Service (IHS) and the National Center for Health Statistics revealed that, during the 1990s, OM-associated outpatient visit and hospitalization rates among American Indian and Alaska Native children aged younger than 5 years were 2.3- and 2.9-times higher, respectively, than among US children in the same age group.5 Also in the 1990s, Northern Plains American Indians, including residents of the Bemidji Area IHS in Minnesota, had the second highest rates of IHS outpatient visits and hospitalizations for OM.5

Although OM rates are higher among American Indians/Alaska Natives than among other groups, little is known about specific factors that could affect their OM risk. Potentially modifiable risk factors for early OM identified in other populations include upper respiratory infections (URIs),6,7 early colonization with OM pathogens,8 day care

attendance or sibling day care attendance,2,7,9 short breast-feeding duration,6,10 prone sleeping,11 and heavy maternal smoking.12 Family history is also an important risk factor,1,7,13 one that may be attributed to shared environmental or genetic factors. A substantial heritable component has been demonstrated in twin studies,14–16 and evidence for links between chronic and recurrent OM and regions on chromosomes 10q and 19q was recently demonstrated in a group of Minnesota families.17

Racial and ethnic differences in OM incidence may arise from disparities in socioeconomic status, access to and use of health care, and variations in the prevalence of environmental and genetic risk factors. For example, in a study of Black and White children, Paradise et al. showed that race was no longer predictive of time with middle ear effusion after control for socioeconomic status.18 The aim of the Little Ears Study, described here, was to investigate OM epidemiology in American Indian children from birth to age 2 years, including OM incidence in the first 6 months of life (hereafter, "early OM"), as well as relationships between early OM onset and sociodemographic characteristics, OM risk factors, and maternal knowledge and attitudes.

Otitis media (OM) is an inflammation of the middle ear associated with infection. Despite appropriate therapy, acute OM (AOM) can progress to chronic suppurative OM (CSOM) associated with ear drum perforation and purulent discharge. The effusion prevents the middle ear ossicles from properly relaying sound vibrations from the ear drum to the oval window of the inner ear, causing conductive hearing loss. In addition, the inflammatory mediators generated during CSOM can penetrate into the inner ear through the round window. This can cause the loss of hair cells in the cochlea, leading to sensorineural hearing loss. Pseudomonas aeruginosa and Staphylococcus aureus are the most predominant pathogens that cause CSOM. Although the pathogenesis of AOM is well studied, very limited research is available in relation to CSOM. With the emergence of antibiotic resistance as well as the ototoxicity of antibiotics and the potential risks of surgery, there is an urgent need to develop effective therapeutic strategies against CSOM. This warrants understanding the role of host immunity in CSOM and how the bacteria evade these potent immune responses. Understanding the molecular mechanisms leading to CSOM will help in designing novel treatment modalities against the disease and hence preventing the hearing loss.

## Methodology:-

**Study design:-**
This study was community base cross section study.

**Study area:-**
It was in KSA.

**Study population:-**
In all gender and age population

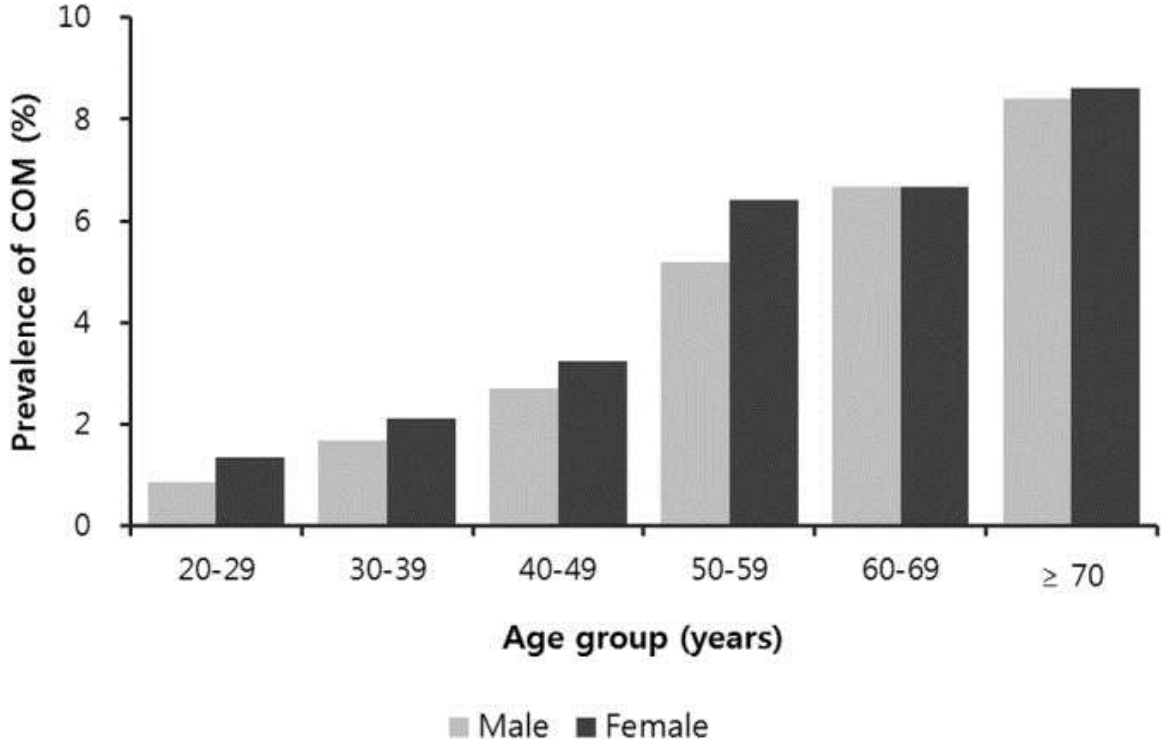
**Sample size:-**
100 in all gender and age population

**Sample technique:-**
We selected our sample by random sampling .

**Collecting tool :-**
The Collected of date was done by 3 part questionnaire : about the Personal data, level of knowledge and awareness for otitis media in all gender and age

**Analysis :-**
The data was collected , then clearance and coding was done, also entered data and analysis was done by SPSS .

**Result:-**




Revalence of chronic otitis media by age group and sex in adults.The prevalence of chronic otitis media increased with age in both sexes.

Prevalence of COM

Among the 16,063 participants, the weighted prevalence of COM was 3.8% (tympanic perforation, 2.17%; cholesteatoma, 1.82%; otitis media with effusion, 0.68%), and those of the right, left, and both ears were 1.5%, 1.4%, and 0.9%, respectively.

The prevalence of COM according to the general characteristics of the participants is described in Table 1. Age, sex, education, residence, earphone use in noisy situations, number of household members, and subjective health status affected the prevalence of COM. An increased prevalence was associated with old age ($P < 0.0001$), female sex ($P = 0.0287$), lower education level ($P < 0.0001$), urban residence ($P = 0.0239$), not using earphones in noisy situations ($P < 0.0001$), fewer household members ($P < 0.0001$), and a poor subjective health status ($P < 0.0001$). There were no significant differences between male and female patients among the six different age groups, but the prevalence of COM tended to increase with age (Fig 1).

Prevalence of chronic otitis media according to otologic conditions of participants.

| Characteristics | Unweighted total number | COM weighted*, % (SE) No | Yes | P value |
|---|---|---|---|---|
| Subjective hearing | | | | <0.0001 |
| Not discomfort | 13715 | 97.5 (0.2) | 2.5 (0.2) | |
| A little discomfort | 1852 | 89.9 (1.0) | 10.1 (1.0) | |
| A lot of discomfort | 444 | 72.7 (2.9) | 27.3 (2.9) | |
| Cannot hearing anything | 45 | 76.0 (7.1) | 24.0 (7.1) | |
| Tinnitus | | | | <0.0001 |
| Yes | 3593 | 93.3 (0.5) | 6.7 (0.5) | |
| No | 12425 | 97.1 (0.2) | 2.9 (0.2) | |
| **Not remember** | **38** | **96.6 (2.4)** | **3.4 (2.4)** | |
| Facial | | | | 0.9230 |

| | | | | |
|---|---|---|---|---|
| palsy(House-brackman grade) | | | | |
| Ⅰ~Ⅱ | 16027 | 96.2 (0.2) | 3.8 (0.2) | |
| Right side Ⅲ~Ⅵ | 21 | 95.6 (4.4) | 4.4 (4.4) | |
| Left side Ⅲ~Ⅵ | 15 | 94.3 (5.4) | 5.7 (5.4) | |
| Preauricular sinus, right | | | | 0.3345 |
| Normal | 15919 | 96.3 (0.2) | 3.7 (0.2) | |
| Abnormal | 144 | 93.9 (2.4) | 6.1 (2.4) | |
| Preauricular sinus, left | | | | 0.1339 |
| Normal | 15913 | 96.2 (0.2) | 3.8 (0.2) | |
| Abnormal | 150 | 97.7 (1.0) | 2.3 (1.0) | |

## Conclusions:-

For treatment of disturbed middle ear ventilation and otitis media, numerous evidence-based therapeutic approaches are available. Regarding several other options, the evidence situation is currently not sufficient or even recommendations against a therapy are given despite the fact that they were applied as clinically established and routine intervention for many years. The evidence gaps have to be closed in the following years. For this purpose, clinical studies are required in order to generate an evidence-based study situation. But also new therapeutic concepts as for example the use of tube stents have to be evaluated after clinical introduction with regard to their evidence. The necessity justifies the claim to conduct clinical studies; despite increasingly economic limitations and few resources, they will have to find excellent conditions in Germany.

Children with asthma or other atopic conditions have a significantly increased risk of recurrent or persistent otitis media. Children with immunogenetic predisposition to asthma or atopic conditions appear to have a similar risk for otitis media even before the onset of clinical asthma. This association is unlikely to be due to asthma medications or detection bias but potentially due to impairment in both innate and adaptive immunity and structural alterations of upper airways. Given the significant impact of atopic conditions on the risk of recurrent and persistent otitis media and the large proportion of children who are affected by atopic conditions, it is necessary to develop individualized guidelines for the management of recurrent or persistent otitis media for children with atopic conditions, a relatively under-recognized risk factor for otitis media. Also, it is reasonable to believe that increased susceptibility to otitis media linked to underlying immune dysfunctions is a potential feature of atopic conditions. In the future, the guidelines for management of asthma or other atopic conditions should consider addressing a broader range of management issues for infectious diseases including recurrent and persistent otitis media among patients with atopic conditions.

## Recommendation:-

1. To diagnose AOM, there must be acute onset of symptoms such as otalgia (or nonspecific symptoms in nonverbal children), signs of a middle ear effusion associated with inflammation of the middle ear (ie, a TM that is bulging and, usually, very erythematous or hemorrhagic, and yellow or cloudy in colour) or a TM that has ruptured.
2. For otherwise healthy children ≥6 months of age who have mild illness with appropriately diagnosed AOM criteria or children who do not fully meet diagnostic criteria, a watchful waiting approach for 48 h is an option if follow-up can be assured. Advice regarding analgesics must be provided. It is recommended to:reassess the child within 24 h to 48 h to document the clinical course; OR have the caregiver return if the child does not improve or worsens anytime within 48 h; OR provide an antimicrobial prescription to be filled if the child does not improve.
3. Children with a bulging TM who are febrile (≥39°C) and moderately to severely systemically ill, or who have severe otalgia, or who have already been significantly ill for 48 h should be treated with antimicrobials.
4. If a decision is made to treat with antimicrobials, amoxicillin either divided twice per day at a dose of 75 mg/kg/day to 90 mg/kg/day or amoxicillin divided three times per day at a dose of 45 mg/kg/day to 60 mg/kg/day are the first choices for AOM therapy.

A five-day course of an appropriately dosed antimicrobial is recommended for most children ≥2 years of age with uncomplicated AOM, with a 10-day course being reserved for younger children (six to 23 months) and cases with a perforated TM or recurrent AOM.

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