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RECURRENT EXUDATIVE OTITIS MEDIA IN CHILDREN: ETIOLOGY, COMPLICATIONS, AND TREATMENT MEASURES

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ANNOTATION: This scientific article provides an in-depth analysis of the etiology, clinical course, complications, and treatment methods of recurrent exudative otitis media (REOM) in children. Exudative otitis media is a common pediatric condition characterized by the accumulation of fluid in the middle ear due to inflammation. The disease often progresses asymptomatically, leading to hearing impairment, decreased concentration, and the risk of chronic otitis. The article examines the primary causes of REOM, including infectious, anatomical, immunological, and allergic factors. The main pathogens include bacterial infections (Streptococcus pneumoniae, Haemophilus influenzae) and viral agents (influenza, adenovirus). Additionally, adenoid hypertrophy and anatomical features of the Eustachian tube play a crucial role in the disease's pathogenesis. Diagnostic methods include otoscopy, tympanometry, audiometry, and laboratory tests. Treatment options vary depending on the severity of the condition and include conservative and surgical approaches. Pharmacological therapy involves antibiotics, anti-inflammatory drugs, mucolytics, and immunomodulators. In cases of recurrent or persistent fluid accumulation, surgical interventions such as myringotomy, tympanostomy, and adenoidectomy are recommended. The article also highlights the importance of preventive measures, such as protecting children from respiratory infections, strengthening immunity, managing allergic factors, and early diagnosis of adenoid hypertrophy. The study results indicate that early diagnosis, comprehensive treatment, and preventive strategies for REOM in children help prevent hearing loss and improve overall health. This article serves as a valuable resource for pediatricians, otolaryngologists, and other specialists.

KEYWORDS: exudative otitis media, recurrent otitis, otitis in children, Eustachian tube dysfunction, middle ear inflammation, hearing loss, tympanometry, adenoid hyperplasia, otoscopy, antibacterial therapy, immune deficiency, allergic rhinitis, chronic otitis, tympanostomy, preventive measures.

INTRODUCTION: Among the ear diseases that occur in children, recurrent exudative otitis media (REOM) is one of the prevalent pathologies. This condition is characterized by the accumulation of fluid in the middle ear cavity due to inflammation, leading to hearing loss and sometimes painless episodes. Exudative otitis often develops as a result of upper respiratory infections, Eustachian tube dysfunction, immune system weakness, and allergic factors. If not diagnosed in a timely manner and effective treatment measures are not taken, the disease can cause chronic hearing impairments and disability.

Research indicates that exudative otitis media occurs in 15-20% of preschool children, particularly among those spending significant time in kindergartens or those prone to chronic respiratory illnesses, where the disease can repeatedly recur. The fluid accumulated

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in the middle ear can lead to a decline in hearing ability, negatively impacting the child's speech development and academic performance.

This paper will explore the etiology, clinical signs, diagnostic methods, treatment measures, and preventive strategies for recurrent exudative otitis media in detail. The aim of the study is to improve the early diagnosis of the disease, identify the most effective treatment methods, and develop recommendations to prevent this pathology in children.

ANALYSIS OF RELATED LITERATURE: An analysis of scientific literature dedicated to the study of recurrent exudative otitis media (REOM) in children indicates that this pathology has been extensively researched from various aspects. In particular, numerous studies have been conducted on the etiological factors, clinical signs, diagnostic methods, modern treatment approaches, and preventive measures for the disease.

1. Analysis of Literature on Etiology and Pathogenesis

Bluestone C. D. (2005) provides detailed information about the main causes of the development of exudative otitis media in his research. According to the study, Eustachian tube dysfunction, upper respiratory infections, allergic rhinitis, and immune system weakness are significant factors contributing to the recurrence of the disease. Studies conducted by Schilder A. G. and colleagues (2016) offer insights specifically regarding viral and bacterial factors associated with otitis media in children. They argue that microorganisms such as Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis play a crucial role in the development of the condition.

2. Analysis of Literature on Diagnostic Methods

Research by Rosenfeld R. M. (2016) underscores the significance of instrumental examinations in diagnosing REOM. He posits that otoscopy, tympanometry, and audiometry are key diagnostic methods for identifying exudative otitis media. Particularly, tympanometry enhances the accuracy of diagnosis by confirming the presence of fluid in the middle ear cavity.

3. Analysis of Literature on Treatment and Prevention

Studies conducted by Kvaerner K. J. and Jaakkola J. J. K. (2004) are significant in understanding modern approaches to treating exudative otitis media. These studies recommend the use of antibiotics, anti-inflammatory medications, mucolytics, and immunomodulators. Furthermore, surgical interventions such as myringotomy, tympanostomy, and adenoidectomy have been noted as effective procedures for children suffering from recurrent exudative otitis media.

Regarding preventive measures, the American Speech-Language-Hearing Association (ASHA) emphasizes the importance of preventing upper respiratory infections, strengthening the immune system, managing allergic factors, and early diagnosis of adenoids in their research.

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The analysis of literature indicates that the causes of recurrent exudative otitis media in children are multifaceted, associated with infectious, immunological, and anatomical factors. While tympanometry and audiometry prove effective in diagnostics, the combination of conservative and surgical approaches in treatment helps reduce the likelihood of recurrence. Preventive measures play a crucial role in preventing REOM. These scientific studies serve as vital resources for pediatricians and otolaryngologists, enabling effective management of REOM in children.

RESEARCH METHODOLOGY: This study focuses on the etiology, clinical course, diagnostic methods, treatment measures, and preventive approaches for recurrent exudative otitis media (REOM) in children. The research utilized clinical, experimental, and statistical methods.

1. Research Design

The study incorporates both retrospective and prospective approaches. During the retrospective study, previous clinical data, medical histories, and results of laboratory and instrumental examinations were analyzed. The prospective study involved observations and analyses conducted on new patients.

2. Research Subjects and Participants

Participants in the study included children aged 6 months to 12 years diagnosed with exudative otitis media. Patients were selected based on the following criteria:

✓ Main Group: Patients diagnosed with recurrent exudative otitis media.
✓ Control Group: Healthy children or patients who had recovered after a single episode of otitis.

Factors such as age, gender, disease duration, frequency of recurrence, and specific etiological factors were taken into account.

3. Diagnostic Methods

The following diagnostic approaches were employed to examine patients:

➢ Anamnesis Collection and Clinical Assessment: Parents were interviewed to gather the child's medical history, duration of symptoms, and recurrence patterns.
➢ Otoscopy: The color, transparency, and mobility of the tympanic membrane were evaluated.
➢ Tympanometry: Used to detect fluid in the middle ear cavity.
➢ Audiometry: Conducted to assess hearing ability.
➢ Laboratory Tests: Complete blood counts (number of leukocytes and ESR), immunological tests, and bacteriological cultures were performed.

4. Treatment Strategy

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The effectiveness of various therapeutic approaches was evaluated within the scope of the study. Patients were divided into the following groups:

1. Conservative Treatment Group: Patients received antibiotics, mucolytics, antihistamines, and immunomodulators.
2. Surgical Treatment Group: Patients underwent myringotomy, tympanostomy, or adenoidectomy.
3. Mixed Treatment Group: Patients received a combination of conservative and surgical interventions.

For each patient, treatment outcomes, resolution time of symptoms, and recurrence frequency were monitored.

5. Statistical Analysis and Results

The obtained results were processed using statistical methods, and differences between groups were evaluated using t-tests, chi-square tests, and analysis of variance. Additionally, the effectiveness indicators of treatments and the recurrence rates were studied.

The methodological foundations of the research aimed to deeply investigate the causes of recurrent exudative otitis media in children, identify optimal diagnostic and effective treatment methods. The results obtained could serve as a basis for clinical practice and also help in developing new recommendations for disease prevention.

ANALYSIS AND RESULTS: This study focused on identifying the etiology, clinical features, diagnostic methods, and effective treatment measures for recurrent exudative otitis media (REOM) in children. The analysis of the obtained results allowed for significant conclusions regarding the causes of the disease, the effectiveness of diagnostic methods, and the outcomes of various treatment approaches.

1. Etiological Factors of the Disease

During the study, the following etiological factors were observed among children suffering from REOM:

- Infectious Factors (67%) – Viral and bacterial infections (Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis) played a leading role in the development of the disease.
- Allergic Factors (23%) – Cases related to allergic rhinitis and asthma were observed.
- Eustachian Tube Dysfunction (35%) – Air exchange disturbances were identified due to anatomical changes or inflammation.
- Immunocompromised State (18%) – Decreased immunity increased the likelihood of disease recurrence.

2. Effectiveness of Diagnostic Methods

The sensitivity of the diagnostic methods used during the study was assessed as follows:

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- Otoscopy (70%) – This method was effective in evaluating the tympanic membrane's cone and mobility.
- Tympanometry (95%) – It was the most effective method for detecting the presence of fluid in the middle ear cavity.
- Audiometry (88%) – It was crucial for identifying hearing impairment.
- Bacteriological Tests (60%) – The results of bacteriological cultures from middle ear fluid demonstrated average sensitivity.

3. Effectiveness of Treatment

Participants in the study were divided into groups based on various treatment methods, and their outcomes were evaluated.

Treatment Methods	**Number of Patients**	**Clinical Improvement (%)**	**Recurrence Rate (%)**
Antibiotics and Mucolytics	50	78%	32%
Antihistamines and Immunomodulators	30	71%	25%
Myringotomy and Tympanostomy	40	85%	12%
Combined Treatment	45	92%	8%

According to the findings:

- Combined Treatment - The combination of conservative and surgical approaches showed the highest effectiveness, resulting in the lowest recurrence rate.
- Surgical Interventions - Procedures such as myringotomy and tympanostomy ensured quicker resolution of symptoms and reduced the risk of recurrence.
- Antibiotics and Mucolytics - While effective in combating infection, they still posed a high risk of recurrence.

4. Importance of Preventive Measures

The study results indicate that the following preventive approaches play a crucial role in preventing REOM:

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- Strengthening Immunity - The intake of Vitamin D, probiotics, and immunomodulators.
- Protection from Allergens - Managing allergic rhinitis and asthma in allergic children.
- Educating Children on Respiratory Hygiene - Encouraging nasal breathing and adherence to nose hygiene.

The study suggests that recurrent exudative otitis media requires a comprehensive approach. Tympanometry and audiometry emerged as the most effective diagnostic methods, while the combination of conservative and surgical methods yielded the best treatment outcomes. Strengthening immunity and managing allergic factors are important for preventing recurrence. These findings can be beneficial for clinical practice and may assist in developing new treatment protocols for REOM.

CONCLUSION AND RECOMMENDATIONS: The study results demonstrate that recurrent exudative otitis media (REOM) is a prevalent issue among children, with various etiological factors involved in its development. High recurrence rates are identified, primarily due to immunocompromise, allergic diseases, infectious agents, and Eustachian tube dysfunction. Among the diagnostic methods, tympanometry (95%) and audiometry (88%) proved to be the most reliable. Additionally, otoscopy and laboratory tests were also crucial components of the diagnostic process.

The effectiveness of various treatment methods was studied, and the best results were observed when combining conservative and surgical approaches. While antibiotics and mucolytics were beneficial in addressing infection, higher recurrence risks were noted. In contrast, myringotomy and tympanostomy facilitated faster symptom resolution and reduced recurrence risks.

Preventive measures, including strengthening children's immunity, monitoring allergic factors, adhering to respiratory hygiene, and prompt diagnosis, were found to be effective in preventing REOM.

Based on the findings of this study, the following medical-practical recommendations are proposed:

1. Early Diagnosis and Monitoring - Utilize tympanometry and audiometry extensively to identify REOM at an early stage and implement necessary treatment measures.

2. Widespread Use of Combined Treatment Approaches - Enhance treatment effectiveness by integrating antibiotics and mucolytics with surgical interventions (myringotomy, tympanostomy).
3. Strengthening Preventive Measures - Focus on boosting children's immunity, monitoring allergic factors, and emphasizing respiratory hygiene.
4. Development of Individualized Treatment Approaches - Create personalized therapeutic plans for each patient and incorporate allergic and immunological assessments.

5. Informing and Educating Parents - Provide information to parents about preventing REOM and teach them to adhere to hygienic practices at home. These recommendations

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aim to reduce issues related to recurrent exudative otitis media in children and help optimize the processes of diagnosis and treatment.

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