ADENOIDITIS AND OTITIS MEDIA WITH EFFUSION: RECENT PHYSIO-PATHOLOGICAL AND TERAPEUTIC ACQUISITION

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[Adenoidite e otite media effusiva: recenti acquisizioni fisio-patologiche e terapeutiche]

SUMMARY

Otitis media with effusion (OME) deserves special attention because of its diffusion, the anatomical and functional abnormalities and the complications which may result.

The literature has been widely supported for a long time the role of hypertrophy and/or adenoid inflammation in the development of OME.

Although several clinical studies have established the effectiveness of adenoidectomy in the treatment of OME, there are discordant opinions about.

The fundamental hypothesis that motivates this study is that the OME in children is demonstration of subacute or chronic inflammation of the upper airway that has its epicenter in the rhinopharynx.

Because of these reasons we effectuated a critical review of issues related to the adenoid inflammation in the pathogenesis of the OME and the indication of adenoidectomy surgery in order to define the relationship between OME and adenoiditis.

RIASSUNTO

L'otite media effusiva (OME) merita particolare attenzione per la diffusione, le alterazioni anatomo-funzionali e le complicanze cui può dare luogo.

In letteratura è stato ampiamente sostenuto da tempo il ruolo della ipertrofia e/o delle flogosi adenoidee nell'insorgenza di OME.

Anche se diversi lavori clinici hanno constatato l'efficacia dell'adenoidectomia nel trattamento dell'OME, le opinioni sono discordi.

L'ipotesi fondamentale che motiva questo studio è che l'OME in età pediatrica è una manifestazione di flogosi subacuta o cronica delle vie aeree superiori che ha il suo epicentro nel rinofaringe. Per tali ragioni abbiamo effettuato una revisione critica delle problematiche collegate alle flogosi adenoidee nella patogenesi dell'OME e all'indicazione dell'intervento di adenoidectomia nell'intento di tracciare un quadro il più completo possibile della relazione tra adenoidite e OME.

Key words: Otitis media with effusion, adenoiditis, therapy

Parole chiave: Otite media secretiva, adenoidite, terapia

Otitis media with effusion (OME)

OME, middle ear disease with many denominations, is a subacute or chronic inflammation by multifactorial etiology, characterized by the presence of serous, mucous, or mixed, non-infected secretion, persistent for more than three months in the middle ear⁽¹⁾.

The incidence is higher in children (ratio children / adults = 10/1), particularly pre-school (61%) than school age (22%), occurs mainly in winter and spring coinciding with infectious and/or allergic inflammation of Upper Airway and Digestive Tract (U.A.D.T.)⁽²⁾.

The incidence of OME after acute otitis media (AOM) is high, with a percentage between 6-10% for some authors or even 42%-60% for others

authors⁽³⁾; the persistence of secretion in the tympanic chest after AOM is almost considered normal and is attributed mainly to the presence of immunecomplexes⁽⁴⁾.

Inflammation of the middle ear and tubal dysfunctionare the most important etiopathogenic factors: were identified a number of established risk factors (infection of upper airway-UA, adenoid hypertrophy, seasonality, inadequate antibiotic therapy, genetic and racial factors) and risk factors accessories (familiarity allergic, mild immunodeficiency, sex, geographical and environmental factors).

The role of upper airway inflammation in the onset of middle ear inflammation is documented in the most recent data highlight the importance of bacterial and viral infection, allergy, immuneinflammation and tubal dysfunction. The bacterial infection is brought to the attention by the finding, in patients with SOM, of a previous acute episode of bacterial or viral infections of the UA (65-78%) and relief in endotympanic secretion microcolture of infectious agents including Haemophilus influentiae, Staphylococcus aureus and Streptococcus pneumoniae, and less frequently, Branhamella catarrhalis Enterococci, anaerobes absent⁽⁵⁾.

Viral infections, which etiological diagnosis is not easy for the presence of inhibitory substances and antibodies in the endotympanic secretion, will be borne mainly by Respiratory Syncytial Virus, Influentia Virus A and B, Parainfluentia Viruses 1-2-3, Adenovirus, Rhinovirus, Herpes simplex, Coxsachie B4⁽⁶⁾.

The role of allergy, considered relevant in 10%, has been emphasized by some authors 48%-74% and reduced by others.

In the tympanic mucosa was documented the possibility of allergic-iperergic reaction, even if there is a discrepancy of data: finding in the endo-tympanic versement of the amount of IgE higher than those found in serum according to some authors⁽⁷⁾ and lower for other authors⁽⁸⁾.

OME caused by adenoids does not differ much from the usual clinical appearance of OME: it should however be noted that this complication of the adenoids has a more frequent incidence in the seasons most favorable to the onset of events inflammatory nasopharyngeal a greater predilection toward pediatric age, a common connection with nasal symptom, which sometimes precedes the onset.

Diagnosis of OME caused by adenoiditis must consider both ear images, both nasopharyngeal among which are particularly important nasopharyngeal endoscopy and allergy investigations.

Otoscopy shows the usual clinical appearence: the effusion can be either serous, mucous or mixed^(1,9). Endoscopy allows us to observe the conditions of the nasal cavity and nasopharynx mucosa, particularly tubal region⁽¹⁰⁾; endoscopic study here shows swollen mucosa, translucent appearance, with features of allergic and bacterial inflammation.

Adenoiditis

Adenoiditis, acute and chronic inflammatory processes of the adenoids usually affecting child under 10-12 years old, have among the most common complications otitis media with effusion. An assumption that the adenoids correlated with middle ear disease in patients with OME requires that the adenoids tend to be larger (adenoidal hypertrophy) and so tend to close the Eustachian tube.

In normal children the size and appearence of the adenoids varies from year to year. Particularly the adenoids are rapidly increased from three to five years of age, with a consequent increase in mouth breathing, and thereafter remain relatively constant, while the size of the nasopharynx and airway gradually enlarge.

Some authors assert that there is no correlation between adenoid volume and frequency of OME, in particular, there was no difference in weight of adenoids among a group of patients with OME and a normal⁽¹¹⁾.

Recent study show the role of inflammation in the onset of OME, highlight the importance of the role of bacterial infection and immunological changes.

The nasopharynx of many newborns are colonized by potential respiratory pathogens: Streptococcus pneumoniae and Haemophilus influenzae. These bacteria were considered to be implicated in the pathogenesis of the OME⁽¹²⁾.

Bacteriological studies on adenoids of children predisposed and not predisposed to inflammation of the middle ear suggests that there may be an important relationship between the normal flora, which is represented mainly by Streptococcus viridans, and potential pathogens that frequently coexist in the adenoid tissue⁽¹³⁾.

In particular, they showed that the S. Viridans (alpha-hemolytic Streptococcus) is predominant in the microbial flora of the nasopharynx in normal subjects, whereas in susceptible otitis percentage of S. Viridans decreases and, simultaneously, increase the percentage of S. Pneumoniae and Haemophilus influentiae untyped and Moraxella catarrhalis.

The mechanisms responsible for this alteration of the bacterial microenvironment of the nasopharynx may be related in part to factors that alter the muco-ciliary function. Factors that may be associated with increased colonization in the nasopharynx and perhaps the increase of adhesion to the mucosa of the nasopharynx, are viral infections, allergy, local and systemic immune deficiency and indiscriminate use of antibiotics⁽¹³⁾.

From these studies results a positive response with regard to the influence of adenoids on etiophatogenesis of OME. Knowledge of immunological reactions of the adenoids of patients with OME are limited to a few studies⁽¹⁴⁾.

A study to identify differences in immune responses of adenoids in children with OME showed a significantly higher number of PCA-1 positive cells (presumably plasma-cells) compared with a normal control group, while no differences were found concerning the distribution of T and B cells.

Some authors support the hypothesis that the OME was associated with an immune response that influences the production of Immunoglobulin in the adenoid tissue⁽¹⁵⁾.

Secretory otitis media treatment

The treatment of OME, complication of adenoiditis, should be directed to the resolution of otologic and nasopharyngeal disease.

The treatment consist of medical and/or surgical procedures. The different therapeutic choices are derived from knowledge of the clinical data.

Medical therapy of OME approach, fundamental to the treatment, was not easy for many aspects including the multi-factor of the condition resulting in multi-directional direction drug, its incidence in children, the moment of intervention, the therapeutic management.

Used alone or integrated with other aids, is irreplaceable and used at different times of the OME treatment: the elimination and correction of several factors, improving hearing, prevention of unwanted anatomical and functional sequele.

The medical treatment of secretory otitis media, directed not only to the many etiopathogenetic factors but also with regard to the effects, using various therapeutic measures that aim to:

• Combat the infectious agent (antibiotics);

• Promote the drainage or the reabsorption of endotympanic effusion (steroidal and non-steroidal anti-inflammatory drugs, mucolytics, antihistamines and decongestants);

• Correct the constitutional grounds (specific immunotherapy, catarrh vaccines, gamma globulin, thermal water, vitamins and trace elements).

Surgical treatment consists of surgical drainage of the nasopharynx (adenotomy or adenoidectomy), which itself often leads to healing of otologic disease. Sometimes is needed other surgical procedures: the ablation of the palatine tonsils (tonsillectomy) when there is sharing of immune and inflammatory processes in the nasopharyngeal district; the insertion of a ventilation tube and antrum-attic-mastoidectomy when the otological disease remains unchanged despite various treatments.

Therapeutic protocol of the Institute of Otolaryngology, University of Catania

The therapeutic approach of OME of our school is to carry out at least two cycles of medical treatment before to consider any other types of treatments.

The first cycle contemplates the therapeutic association of targeted antibiotic therapy after bacterial culture and antimicrobial susceptibility test of nasopharyngeal or tubal secretions, corticosteroids, mucolytic, antihistamines, decongestants realized at the time of diagnostic clarification.

The possible use of other therapy comes from clinical or laboratory findings (gamma globulin, in cases of poor conditions or finding of any deficiency, vitamins, trace elements, particularly in the case of iron deficiency).

The next cycle use, with mucolytics, decongestants, etc.., vaccine therapy, in particular autovaccine therapy.

Depending on the results obtained can be considered useful additional cycles with added use of general or local vaccines, thymus extracts, crenotherapy, otherwise can be considered useful to associate surgery (adenoidectomy or adenotonsillectomy, ventilation tube, Antrum-attic-mastoidectomy).

The different therapeutic choices are derived from otoscopic and endoscopic observations and functional investigations (audiometric and impedenzometric examination).

Endoscopic examination of the nose and nasopharynx, particularly the ostium of the Eustachian tube, it is particularly important because it allows the knowledge of the factors involved in inflammatory disease, and because it allows you to cytological and bacteriological search.

The endoscopic study allows to observe the presence of inflammation, the mechanical barrier caused by adenoid hypertrophy, the functional obstacle caused by malformation as cleft palate.

Otoscopic study, conducted for an appropriate period of time, allows to know the "natural history" of the OME patological cycle that the appearences are different depending on the period of observation. Knowledge of clinical data allows the use of different therapeutic approaches based on rational choices. For example, the possibility of using antibiotic therapy alone is reasonable in recurrent otitis in which an acute episode is a complication. Conversely, the presence of middle ear secretion, especially between acute episodes, or the presence of maxillofacial malformation disease requires the choice of surgery therapy (ventilation tube). Surgical approach (ventilation tube, adenoidectomy, antrotomy) has an exact indication dependent on clinical data or the possible presence of complications.

Particular attention is given to other treatments such as iron, immunostimulants, immunomodulators, and especially for us, autovaccine: these treatments are designed to modify known or supposed weaknesses such as low serum iron or deficiency of the immune system.

Rehabilitation therapy to the Eustachian tube, speech therapy or physiotherapy, has been designed considering the age, when you can practice it has an important role in the resolution of pharyngeal dysfunction paraphysiological.

In addition to the different treatment options should be considered the prevention of risk factors.

Conclusions

The documentation of the association with an increased bacterial count of potential pathogens in the nasopharynx and the data suggest that adenoidectomy is a valid and effective therapeutic approach in the treatment of OME regardless of the size of the adenoids, lead to the hypothesis that the OME is caused by a chronic bacterial infection of the adenoids or a weakened capacity of the adenoids to neutralize the bacteria⁽¹⁶⁾.

Children with chronic adenoids and OME should be carefully evaluated in order to highlight environmental, immunological, infective and nutritional causes. In many cases medical treatment, nutritional support and improved nasal hygiene can resolve OME.

Medical treatment is directed primarily towards the eradication of bacterial infection with the use of appropriate antibiotic therapy.

The long-term use of antibiotics may lead to a reduction of colonies of streptococci and the possibility to remove an important mechanism for the prevention of colonization and replication of potential pathogens, as well as Untyped Haemophilus Influenzae (UHI) and Streptococcus Pneumoniae.

Therefore the last decade the research interest was directed towards the development of antibacterial vaccines.

Studies on the bacteriology of adenoids in children predisposed to OME have showed the protective role of normal microbial flora. The surgery performed at an early stage can prevent the establishment of a OME, which in a late stage inflammation and tubal dysfunction is maintained by a focus of infection in the mastoid site; this explains the ineffectiveness of the adenoidectomy in a late stage.

It can be assumed that if patients with OME are symptomatic for adenoiditis or adenoid hypertrophy, adenoidectomy in the treatment will have beneficial consequences for the OME resolution. The placement of a ventilation tube, surgical procedure which has been abused in recent years, is a surgical procedure that must be properly weighted and that must be considered with specific behavioral history, that is only after an appropriate period of medical treatment and/or drainage of nasopharyngeal cable.

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