

ALLERGY AND MENIERE'S DISEASE: A REVIEW

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The aim of this review is to offer a comprehensive summary of the role of allergic inflammation in Meniere's disease (MD) in order to provide insights into the current clinical concepts concerning the disease.

The pathological feature associated with MD is endolymphatic hydrops, which seems to be due to a multifactorial inheritance leading to altered endolymphatic homeostasis. The factors associated with hydrops include a functional or anatomical obstruction of endolymphatic flow, endolymph malabsorption, genetic anomalies, vasodilation, allergy, viral infection and autoimmunity. The endolymphatic sac is the only site within the inner ear that contains immunocompetent cells, thus allowing the inner ear to mount an active immune response when appropriately stimulated. These functional and morphological circumstances strongly suggest that an immunological etiology of MD is not theoretically unfounded (1).

Duke first suggested an allergic origin in 1923 and, in the 1970s, the role of allergic inflammation was studied in dizzy patients or in those with MD (2, 3, 4, 5, 6, 7). In particular, in a double-blind crossover study of 14 MD patients evaluated for allergies, a number of patients directly related their symptoms to the ingestion of specific foods, and underwent challenge food tests (8).

It has more recently been reported that the incidence of allergic disorders is higher in patients with MD, and correlations have been found with food intolerance (9) and respiratory allergic disease (10). It has also been suggested that a radioallergosorbent test (RAST) for determining allergen-specific IgE should be used together with a clinical evaluation in neuro-otological practice. It has been found that the incidence of IgE hypersensitivity in patients with neuro-otological symptoms alone is 40%, more than double

that in the general population (11). Anti-allergy therapy has been proposed in patients with MD (12).

There are three mechanisms by means of which allergy may play a role in producing fluid in the endolymphatic sac:

- the sac itself may be a "target organ" of mediators released by systemic inhalant or food reactions;
- the deposition of circulating immune complexes may cause inflammation and interfere with the sac's filtering capability;
- and a predisposing viral infection in childhood leading to mildly impaired endolymphatic sac function may interact with allergies in adulthood and cause the sac to decompensate, thus resulting in endolymphatic hydrops (13).

A previous review published by Derebery in 1997 (14) concluded that there is considerable clinical and immunological evidence in favour of a probable role of allergies in MD symptoms: inhalant and food allergies have both been linked with the symptoms, and many of the clinical characteristics of MD suggest an underlying autoimmune etiology. The endolymphatic sac is the site of immune reactivity in the inner ear: a significant percentage of patients with MD and allergy show an improvement in the symptoms of tinnitus and vertigo when receiving specific allergy therapy.

High levels of circulating immune complexes have been found significantly more frequently in MD patients than in control subjects (15) and histological evidence of immune injury to the endolymphatic sacs of patients with MD has also been reported (16).

It has been suggested that certain cases of MD may have an altered immunological background, which may be attributable to an autoimmune mechanism that depends on humoral and/or cellular responses (17).

Most MD patients have virus-specific IgE in their serum (18).

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A preliminary study of a new method of treating otolaryngeal allergy by means of enzyme-potentiated desensitisation (EPD) included patients with MD (19). Interest in the role of allergy in at least some MD patients has recently increased. In a case-control study, 46 MD patients were compared with 46 healthy subjects in terms of their history of allergy (67.3% vs 34.7%), total IgE (41.3% vs 19.5%), and negative specific IgE panel (17.9% vs 67.3%) (20). The significance of the high levels of heat shock protein 70 (HSP-70) found in patients with MD has yet to be defined. No relationship was found between the presence of HSP-70 antibodies and allergy to milk in 56 MD patients with milk allergy (21).

One hundred and thirteen of 137 patients with MD and allergic diseases were treated by means of allergy immunotherapy and the elimination of suspected food allergens; the results showed a significant improvement in both allergy and MD symptoms (22). The inner ear may be a direct or indirect target of an allergic reaction, and there is also the possibility that some allergic peptides or cytokines act as chemical neuromediators (23).

DISCUSSION

Many of the reported studies are only of historical value despite the fact that they suggest a possible correlation between allergy and MD. The possible etio-pathogenetic role of allergy in MD is currently widely accepted. Intermittent allergic diseases can induce repeated inflammatory reactions that cause minimum persistent inflammation and are often misunderstood by patients. In this case, sac dysfunction produces favourable conditions for MD. Furthermore, allergen exposure itself may trigger an attack of MD.

The role of allergic disease in MD is not easy to prove because of the inadequacy of previous study designs: insufficient double-blind studies have been carried out and differential misclassifications of exposure have frequently been reported in case-crossover studies (15).

Allergies must be diagnosed scientifically using the subcommittee's criteria based on a typical anamnesis for intermittent or occasional allergic symptoms, confirmed by positive allergen skin tests (16). The correlation between symptoms and provocative (inhalant or food) allergens must be clearly proved and reproducible. This is quite easy in the case of inhalant allergens, but more difficult in the case of food as the majority of food skin tests are not very specific or sensitive. The diagnostic work-up of suspected food allergies currently includes skin prick tests, the measurement of food-specific immunoglobulin E (IgE), the atopy patch test, and double-blind, placebo-controlled food challenges (DBPCFC). However, as the

results of all of these methods (even DBPCFC) may sometimes be misleading (17), the diagnostic gold standard remains deprivation and provocative dietary tests. Total and specific IgE levels in serum are useful only in selected patients (second level diagnosis), because it is well known that they are highly variable and generally do not correlate with clinical evidence. The role of allergic disease in MD apparently conflicts with the fact that allergies are more frequent in childhood whereas only approximately 3% of all MD patients are in the pediatric age group (18). Moreover a low percentage of allergic adults suffer from MD. It would therefore appear that MD is not a symptom of allergic disease although it could be a consequence of a chronic allergic inflammation.

The correlation between two multifactorial diseases is very difficult to establish, particularly when the causative effect is not immediate. In this case, it is important to use only objective parameters and carry out studies using the principles of evidence-based medicine.

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