HLA and Ménière's disease Susceptibility: A Meta-analysis of Worldwide Studies

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Abstract

Introduction: Ménière's disease (MD) is an inner ear disorder characterized by dysfunctional endolymph resorption that results in a triad of peripheral vertigo, variable unilateral sensorineural hearing loss and unilateral tinnitus. Multiple etiologies have been proposed including an acquired endolymph resorption defect, vascular predisposition, allergies, viral infections, and an autoimmune component. The goal of this systematic review is to further elucidate the association between MD and HLA alleles in characterizing the autoimmune component.

Methods: This meta-analysis utilized PubMed, Google Scholar, ScienceDirect, and Cochrane Library over a period of 8 weeks. To be included in this review, specific HLA serovars required a minimum of three studies presenting HLA alleles of MD and control subgroups. Exclusion was due to insufficient data or non-feasible control groups. Forest plots were created for HLA subtypes' association with MD. The NIH Bias assessment tool and LFK index assessed bias of individual articles utilized in the review.

Results: 11 studies were included in the meta-analysis. Data that met inclusion and exclusion criteria included HLA-A, HLA-B, HLA-C, and HLA-DR serotypes. Odds of MD was increased in patients with HLA-DR11 (OR=1.81, 95% CI [1.27, 2.59], I2=20%, $p<0.05$) as compared to normal controls. Odds of MD was decreased in patients with HLA-DR13 (OR=0.62, 95% CI [0.44, 0.88], I2=21%, $p<0.05$) as compared to normal controls. The remaining 34 assessed alleles distributed between HLA-A, HLA-B, HLA-C and HLA-DRB1 subtypes were not significantly associated with higher or lower frequencies of MD.

Conclusion: The autoimmune component of MD offers the possibility for earlier diagnosis and intervention. HLA-DR11 was a risk factor and HLA-DR11 was a protective factor in the development of MD. The limitations of this analysis included the finite number of studies that published usable data. Future studies of HLA incidence in MD will allow for additional conclusions, specifically investigating haplotypes including the HLA A1-B8-DR3 ancestral haplotype as well as the HPSA1 Heat Shock Protein gene.