Autoimmune Hearing Loss

ImmcoStripe™ Hsp-70 assay enables detection of 68kD (Hsp-70) antibodies associated with autoimmune hearing loss.

Sensorineural hearing loss (SNHL) is a debilitating condition that affects approximately 15,000 individuals per year, with ~4000 cases reported annually in the United States. SNHL may be caused by a variety of factors. Only 10-15% of cases are linked to a specific cause and the majority of cases elude definitive diagnosis.

Cases with no defined cause are referred to as idiopathic SNHL. Suggested causes of idiopathic SNHL include viral infections, vascular compromise, and intracochlear membrane breaks as well as autoimmunity. Autoimmune hearing loss is a subset of SNHL in which there is a sudden onset, rapidly progressing or fluctuating hearing loss that can be unilateral and often progresses to become bilateral.

Autoimmunity is one of the few causes of hearing loss in which prompt detection of autoantibodies and early intervention may prevent progression of the hearing loss. There are number of disorders associated with hearing loss with symptoms similar to autoimmune hearing loss. This makes the diagnosis of autoimmune hearing loss difficult based on clinical presentation alone. Autoimmune hearing loss may occur as the primary or only manifestation of disease it may be associated with other systemic autoimmune disorders such as rheumatoid arthritis, systemic lupus erythematosus, Granulomatosis with polyangiitis and others.

Autoantibodies have been identified in patients with idiopathic hearing loss include:
- Anti-68kD (Hsp-70) Antibody
- Anti-P0 Antibody
- Anti-phospholipid Antibody
- Anti-Nuclear Antibody (ANA)

68 kD (Hsp-70) Antibody Incidence in SNHL

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moscicki et al 1994</td>
<td>58%</td>
<td>96%</td>
</tr>
<tr>
<td>Hirose et al 1999</td>
<td>42%</td>
<td>91%</td>
</tr>
<tr>
<td>Munari et al 2003</td>
<td>84%</td>
<td>93%</td>
</tr>
<tr>
<td>Park et al 2006</td>
<td>76%</td>
<td>91%</td>
</tr>
<tr>
<td>Bonaguri et al 2007</td>
<td>60%</td>
<td>92%</td>
</tr>
</tbody>
</table>

Anti-68 kD (Hsp-70) Antibody

Harris and Sharp in 1990 demonstrated by blot that approximately 58% serum samples of patients with sudden SNHL recognized a 68 kD protein in bovine inner ear extract. This 68 kD protein was later identified as Hsp-70. Since then, Hsp-70 antibodies have been recognized as markers supporting diagnosis of autoimmune hearing loss. As levels of anti-Hsp-70 antibody fluctuate with disease activity, the test may also be useful to follow patient response to treatment. Immco Diagnostics, in collaboration with the University of California, San Diego, has standardized this assay to aid in diagnosis of autoimmune hearing loss (Patent No. US005422282).

ImmcoStripe™ Hsp-70 has proven to be valuable laboratory tool for the detection Hsp-70 antibodies associated with autoimmune hearing loss. A recent study reevaluated the accuracy of Hsp-70 IgG as a serology marker for diagnosis of SNHL with strict clinical diagnostic criteria and in comparison with healthy controls (Bonguri et al 2007). The results showed that 52% of disease patients with SNHL have antibodies to Hsp-70 compared to 4% of controls. Immco's assay is superior to other immunoassays for detecting anti-68 kD (Hsp-70) antibodies (Tebo 2007).
What the experts have to say about anti-68kD (hsp-70) antibodies

Hirose 1999: “In patients with a positive blot, a trial of corticosteroid therapy can be given with good conviction because the test is quite specific.” Laryngoscope. 1999.


Prof. Nicola Quaranta: “…correlation between presence of anti-hsp and hearing recovery are novel and interesting findings.” ENT News 2008.

Selected References


