INTRODUCTION

- Idiopathic sudden sensorineural hearing loss (SNHL) is defined as a decline in hearing over 3 days or less affecting 3 or more frequencies by 30 dB or greater, with no identifiable etiology
- Dexamethasone is known to reduce the end target effects of the inflammatory cascade by mediating the effects of hydroperoxide byproduct and blocks the initiation of multiple cell death pathways

BACKGROUND

- Itoh 1991 was the first to report on the use of intratympanic steroids for inner ear disease (Meniere’s)
- Silverstein et al, 1996 first reported IT Dexamethasone improved cochlear function in certain patients with Memiere’s disease, autoimmune inner ear disease and sudden sensorineural deafness
- Haynes et al, 2006 showed IT dexamethasone to be effective in many cases of SSNHL after failed systemic steroids
- Mannitol has been shown to have cytoprotective properties in the cochlea both in vitro and in vivo.
- Mannitol acts as a free radical scavenger. The action of its hydroxyl groups prevents the formation of reactive oxygen species and therefore, the initiation of mitochondrial damage and subsequent activation of a cell death program
- Wood et al, 2014 showed manitnol demonstrated otoprotection of IHCs and outer hair cells when exposed to gentamycin
- No studies using IT manitol in humans as salvage therapy in patients who have been treated with PO and IT steroids

METHODS

Retrospective single institution case series.
Patients were previously injected with IT mannitol between January 2013 and March 2014.
37 reviewed - 24 patients met criteria
This portion was a comparison between previously performed studies of IT dexamethasone for SSNHL, including hearing recovery and complication rate.
Inclusion criteria
- Adult patient, 18 years and older
- Sudden SNHL documented on audiogram
- Failed prior therapy with oral and IT steroids

Statistical analysis:
Patients previously injected with IT manitol were divided into two groups:
- Idiopathic SNHL
- SSNHL due to Meniere’s

We secondarily intend to determine if there is any difference in hearing recovery (measured in change in SDS) between purely idiopathic cases versus cases with known Meniere’s

RESULTS

Comparison of Hearing Recovery and Complications among Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Percent improved</th>
<th>Criteria for improvement</th>
<th>Complication rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silverstein et al., 1996</td>
<td>25%</td>
<td>10-dB PTA (No SDS)</td>
<td>NA NA 42%</td>
</tr>
<tr>
<td>Jackson, 2002</td>
<td>31%</td>
<td>NA</td>
<td>NA NA NA</td>
</tr>
<tr>
<td>Slattery et al., 2005</td>
<td>55%</td>
<td>10-dB PTA (No SDS)</td>
<td>NA 20% 10%</td>
</tr>
<tr>
<td>Haynes et al., 2006</td>
<td>26.7%</td>
<td>20% SDS</td>
<td>0% 2.5% NA</td>
</tr>
<tr>
<td>Lisi et al, 2012</td>
<td>29%</td>
<td>15% SDS</td>
<td>8.3% 8.3% 8.3%</td>
</tr>
</tbody>
</table>

Hearing recovery between groups:
- 50% (n=12) reported subjective improvement in hearing
  - Idiopathic group 57.14% reported subjective improvement
  - Non-idiopathic group 40% reported subjective improvement
  - P value: 0.4076 (Chi-square)
- Overall 33% (n=8) showed improvement in SDS by “10% criteria”
- 63% (n=15) showed insignificant or no change in SDS
- Only 4% (n=1) showed worse SDS
- Using the criteria 10% improvement in SDS for success
  - Overall 33% (n=8) showed improvement in SDS

CONCLUSIONS

- Our reported complication rate of 8.3% is similar to what has been previously reported in the literature when looking at IT dex.
- There is no statistical difference between SDS in patients salvaged with IT Mannitol when comparing idiopathic to non-idiopathic SSNHL.
- IT mannitol may be considered for salvage in patients with non-idiopathic cause of SSNHL as a potential treatment option.

Limitations and further study:
- Small sample size (only 24 patients met criteria)
- Pilot study with preliminary data
- Plan to use subjects as their own controls and obtain formal data for hearing recovery and complications for IT dexamethasone versus IT manitol
- Retrospective analysis
  - Lacks formal control
  - Clinical experience from a single institution
- We can consider standard protocol for mannitol injection likely in a prospective study
- Clinical use of systemic and intratympanic steroids will continue

CONTACT

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