Cost Analysis of Asymmetrical Sensorineural Hearing Loss Investigations

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ABSTRACT

The purpose of this study is to critically evaluate the typical cost of asymmetrical sensorineural hearing loss (ASNHL) workup, and to compare the positive predictive values from this common presenting symptom.

Demographic information:
- Total patients: NYEE = 127 Minn = 120
- Sex: Male = 115 Female = 132
- Side affected: Left = 124 Right = 123
- Mean age (range): NYEE = 55 (20-91) Minn = 51 (18-85)

METHODS AND MATERIALS

Charts were reviewed using the following ICD-9 codes:
- 386.3, 388.2, 389.1, 389.11, 389.12, 389.14, 389.15, 389.16, 389.18

Inclusion criteria:
- Age ≥ 18 years
- ASNHL defined as > 30 dB difference at ≥3 continuous frequencies

247 patients met inclusion criteria

Table 1. Definition of Positive Test

<table>
<thead>
<tr>
<th>TEST</th>
<th>POSITIVE VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antinuclear antibody (ANA)</td>
<td>&gt; 1:40 dilution</td>
</tr>
<tr>
<td>Erythrocyte Sedimentation Rate (ESR)</td>
<td>&gt; 20 mm/hr</td>
</tr>
<tr>
<td>Lyme Titer</td>
<td>&gt; 1:1600 (lgM)</td>
</tr>
<tr>
<td>Syphilis/Rapid Plasmin Reagin (RPR)</td>
<td>reactive</td>
</tr>
<tr>
<td>Thyroid stimulating hormone (TSH)</td>
<td>&lt; 0.2 uU/mL or &gt; 5 uU/mL</td>
</tr>
<tr>
<td>MRI IAC/CPA</td>
<td>Enhancing lesion, vascular abnormality</td>
</tr>
</tbody>
</table>

RESULTS

Table 2. Positive Detection Rate and Cost

<table>
<thead>
<tr>
<th>Number Performed</th>
<th>Number Positive</th>
<th>Positive Rate</th>
<th>Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Exam</td>
<td>345</td>
<td>16</td>
<td>4.62</td>
</tr>
<tr>
<td>Image Exam</td>
<td>137</td>
<td>4</td>
<td>2.92</td>
</tr>
</tbody>
</table>

*For identifying patient with positive result

DISCUSSION

The increasing cost of medical care, and growing government pressure to contain cost prompted us to examine the cost and diagnostic yield of screening patients presenting with ASNHL by means of serologic and imaging tests at two major geographically separate academic centers. Our study shows that MRI is the most cost-effective test at both institutions. While yielding a very low cost-effective result, 247 patients underwent a total of 462 diagnostic tests. When comparing the average cost of identifying a “positive” patient, MRI is thirty times more expensive than laboratory tests. Despite this, MRI study was the single most ordered test at both centers, with only one case of newly diagnosed acoustic neuroma identified. Based on our findings, we believe that MRI tests should be obtained only after a thorough neurotologic history and examination has been obtained, and clinical suspicion for central pathology high.

CONCLUSIONS

Diagnostic evaluation of asymmetrical sensorineural hearing loss must be directed by patient history and risk factors. We believe that not all patients with ASNHL should get an MRI; however, great caution should be used when deciding not to image. One must not discount the atypical patient harboring an occult tumor. Undeniably, when in doubt whether the presenting symptoms warrant imaging, the risk of missing a tumor may outweigh decreasing cost of the diagnostic workup. In addition, serology proved to yield higher positive findings while costing only 2% compared to imaging. This highlights the importance of getting these simple laboratory tests in patients presenting with ASNHL. Five patients had treatable pathology, two with syphilis and three with Lyme disease.

REFERENCES