CAUSES OF HEARING IMPAIRMENT IN OUR REGION: A SADAREM PROJECT REPORT
M. Prabhakar¹, S. Ramesh², Ch. Narayana Rao³, H. Ramesh⁴

HOW TO CITE THIS ARTICLE:

ABSTRACT: The Hearing Impairment is one of the common physical disability in our society along with Visual Impairment, Physically challenged and Mental Impairment. The Government of Andhra Pradesh had launched a programme so called A SOFTWARE FOR ASSESSMENT OF DISABLED FOR ACCESS REHABILITATION AND EMPOWARMENT (SADAREM) project for verification of certificates of physical disability including hearing Impairment in Srikakulam district of Andhra Pradesh. This prospective study reveals number of candidates with medical certificates had attended the ENT OPD with hearing impairment. This study tell us the percentage of various causes of deafness in this region and also compares with the statistics of Gallaudet Research Institute for hearing impairment.

KEYWORDS: Society, Physical disability, Hearing impairment, SADAREM project, Medical certificates.

MATERIALS METHODS: Almost all 10000 candidates with medical certificates of hearing impairment were verified over a period of 5 years 6 months from May 2009 to till date. As per SADAREM project each candidate has an application form which contains part A and part B. The part A contains bio-data of individuals to be filled up by the district rural development authority officials and it is common for all disabilities. The form B has to be filled up by an ENT surgeon and partly by an Audiologist after proper evaluation, which contains degree of disability at different frequencies, type of hearing impairment and also condition of disability whether to issue temporary or permanent certificate.

The candidates is thoroughly examined clinically in the ENT department by taking proper personal, family, drug history, and the history of exposure to loud sounds before evaluation by special investigation such as PTA, Impedance Audiometry, Speech Audiometry, Free Field Audiometry, BERA and OAE. On clinical examination one questionnaire will be given which contain questions to repeat words like AMMA (mother), NANNA (father), AKKA (sister), KUKKA (dog) and so on in regional language. This study also assess the alertness of candidate such as blinking of eyes on sudden clapping behind the candidate and also look for swallowing movements in the neck due to anxiety along with tests for malingering)¹,² to rule out malingering.

While performing special investigation like PTA, candidates were assessed by repeated response to same intensity and same frequency at different time and comparing with speech reception threshold. If required, the candidates are referred to higher centers for proper evaluation with sophisticated investigations like BERA, OAE etc.
OBSERVATION:

1. **The age distribution:** In total no. of candidates of 9550 is as follows,

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12yrs</td>
<td>627</td>
</tr>
<tr>
<td>13-40yrs</td>
<td>3286</td>
</tr>
<tr>
<td>41-65yrs</td>
<td>5179</td>
</tr>
<tr>
<td>Above 66</td>
<td>458</td>
</tr>
</tbody>
</table>

Table 1

2. **Sex distribution:**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5600</td>
</tr>
<tr>
<td>Female</td>
<td>3950</td>
</tr>
</tbody>
</table>

Table 2

3. **Degree of hearing loss:**

<table>
<thead>
<tr>
<th>Degree of Hearing Loss</th>
<th>Gallaudet research institution</th>
<th>SADAREM project report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild (≤40dB in better ear)</td>
<td>1684</td>
<td>11.8%</td>
</tr>
<tr>
<td>Moderate (41dB to 60dB)</td>
<td>1579</td>
<td>14.8%</td>
</tr>
<tr>
<td>Severe (61dB to 70dB)</td>
<td>2632</td>
<td>3.2%</td>
</tr>
<tr>
<td>Profound (71Db to 90dB)</td>
<td>1879</td>
<td>35.7%</td>
</tr>
<tr>
<td>Total (≥91dB)</td>
<td>2176</td>
<td>32.9%</td>
</tr>
</tbody>
</table>

Table 3

4. **Comparison with reported etiology for hearing impairment of Gallaudet research institution US (1994).**

Reported Etiology of Hearing Loss in the Adult Population, United States, 1990-91 (N=19,327,000).

<table>
<thead>
<tr>
<th>Cause of Hearing Loss</th>
<th>Gallaudet research institution</th>
<th>SADAREM project report</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>4.4%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Ear infections</td>
<td>12.2%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Ear injury</td>
<td>4.9%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Noise induced</td>
<td>33.7%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Getting older</td>
<td>28.8%</td>
<td>35.7%</td>
</tr>
<tr>
<td>Others</td>
<td>16.8%</td>
<td>32.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4

DISCUSSION: While clinical evaluation of the candidates in the ENT department we could find those who can repeat Amma as Abba and oohaaa instead of kukka are identified as deaf-mutes. These group of candidate development sign language and lip reading and they are genuine deaf mutes. Where as in the other group so called malinger, they did not respond to words or signs of examiner and also observed swallowing movement in the neck may due to fear and anxiety. Sometimes, some candidates who are labeled as malinger clinically may become genuine deaf-mute after proper evaluation and vice versa can also occur. Less than 40% of hearing disability is the cutoff point to get financial benefit by government. The candidate will get pension (financial benefits) if disability in
candidates ≥ 40%. So we carefully evaluate the borderline individuals. We send the patients to higher center for proper evaluation with BERA.

**CONCLUSION:** The hearing impairment is one of the common disability in our region (33.4%) along with other disabilities. The Presbyacusis is the commonest cause of hearing impairment in our region accounting about 35.7%. The post traumatic deafness is being the least cause of hearing loss (1.6%). Almost all percentage of causes are on par with Gallaudet research institution except noise induced hearing loss and hereditary/syndromic causes of deafness. Many of our patients are unaware of hazards of noise pollution and consanguineous marriages which are common in this region.
### Hearing Impairment Assessment Proforma Part-B

<table>
<thead>
<tr>
<th><strong>Venue of the Camp:</strong></th>
<th><strong>ID Number (17 Digits):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Name of the Medical Authority:</strong></th>
<th><strong>Address of the Medical Authority:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Name of the Doctor:</strong></th>
<th><strong>Name of the Doctor:</strong></th>
<th><strong>Name of the Doctor:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Designation:</strong></th>
<th><strong>Designation:</strong></th>
<th><strong>Designation:</strong></th>
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</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th><strong>Reg. No:</strong></th>
<th><strong>Reg. No:</strong></th>
<th><strong>Reg. No:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hearing Impairment:**
- [ ] H can perform work by hearing / speaking
  - **Yes**
  - **No**

**Disability / Impairment is due to:** (Please mention the preliminary screening / diagnosis of the disability in good handwriting CAPITAL LETTERS only):

**I.1 Condition of Disability**
- (Please tick only one in the appropriate box)
  - [ ] Permanent, progressive, not likely to improve
  - [ ] Permanent, non-progressive, not likely to improve
  - [ ] Temporary, non-progressive, likely to improve

If Condition of disability is temporary non-progressive, likely to improve please specify the period of reassessment in years:
- [ ] 1 yr
- [ ] 2 yr
- [ ] 3 yr
- [ ] 4 yr
- [ ] 5 yr

**I.2 Cause of Disability:**
1. Congenital
2. Hereditary
3. Birth Injury
4. Birth Asphyxia
5. Meningitis
6. Epilepsy
7. Disease and Infection
8. Malnutrition
9. Accident
10. Any Other (Specify Below)

**Fields with star * mark are mandatory fields**
### Table of reference:

<table>
<thead>
<tr>
<th>Category</th>
<th>Type of Impairment</th>
<th>Speech discrimination</th>
<th>DB Level</th>
<th>% age of impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Mild hearing Impairment</td>
<td>80 to 100% in better ear</td>
<td>DB 26 to 40 dB in better ear</td>
<td>Less than 40% to 50%</td>
</tr>
<tr>
<td>II (a)</td>
<td>Moderate hearing</td>
<td>50 to 80% in better ear</td>
<td>41 to 60 dB in better ear</td>
<td>40% to 50%</td>
</tr>
<tr>
<td>II (b)</td>
<td>Serve hearing Impairment</td>
<td>40 to 50% in better ear</td>
<td>61 to 70 dB in hearing impairment in better ear</td>
<td>51% to 70%</td>
</tr>
<tr>
<td>III</td>
<td>a) Profound hearing Impairment</td>
<td>Less than 40% in better ear</td>
<td>71 to 90 dB</td>
<td>71% to 100%</td>
</tr>
<tr>
<td></td>
<td>b) Total deafness</td>
<td>Very Poor discrimination</td>
<td>91 dB &amp; above in better ear to hearing discrimination</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Pure Tone Audiometry

* (Please assess the frequencies and write the values in appropriate boxes. DB loss will be calculated by the software)

<table>
<thead>
<tr>
<th>Frequency (HZ)</th>
<th>250</th>
<th>500*</th>
<th>1000*</th>
<th>2000*</th>
<th>4000</th>
<th>8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Ear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left Ear</td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### *Speech Discrimination* (Specify Exact Percentage)

% of speech discrimination in Right Ear  
% of speech discrimination in Left Ear  

**Instructions:**

* Please go through the reference table given above and assess the hearing impaired person. Write the assessed values in the boxes provided above.
* Fields with star * mark are mandatory fields.
### Functional Need Assessment for Hearing Impairment

Please tick in the appropriate box(es) if there is need of any of the following services:

#### Hearing Impairment Specific needs (Tick in the appropriate box(es) if there is need of any of the services)

1. **Early Intervention Services:**
   - (For children below three years)
   - I. Speech Therapy

   Note: For any Assistive Devices or Aids and Appliances please fill in the Section 5 of this part.

2. **Surgery:**
   - Please specify the type of surgery:

3. **Speech Therapy**

4. **Language Development**

5. **Assistive & Augmentative Devices For Hearing Impairment**
   - I. Hearing Aid
     - Low Intensity
     - Modern Intensity
     - High Intensity
     - Ill-Cord
     - Tick(✓) only one V-Cord
   - II. Cochlear Implantation
   - III. Implantable Hearing Aid

6. Any Other Hearing Impairment needs (Please write below)

#### General needs (Tick in the appropriate box(es) if there is need of any of the services)

1. **Early Education Service (For Children Below 5 Years)**
   - I. Home based education
   - II. Special school
   - III. Inclusive education

2. **Education Services (Tick(✓) only one)**
   - I. Home based education
   - II. Special school
   - III. Inclusive education

3. **Vocational training (Tick(✓) only one)**
   - I. For employment in public/pvt. Sector
   - II. For self-employment

4. **Counselling & Guidance (Tick(✓) only one)**
   - I. Individual (Person with disabilities)
   - II. Family
REFERENCES:

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FINANCIAL OR OTHER COMPETING INTERESTS: None

4. Tutor, Department of ENT, RIMS, Srikakulam, Andhra Pradesh.

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