IMPLEMENTING TARGETED HEARING SCREENING FOR AT RISK INFANTS AND CHILDREN IN SIERRA LEONE

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Universal screening now exists in many developed countries:
- Aurelio and Tochetto (2009) reported 55 newborn hearing screenings in existence.
- Very few screening programmes in developing countries however.

Evidence recommends:
- Universal Screening if possible
- Targeted Screening if there are resource constraints

**India**
- First to try screening at risk neonates in 1986

**Oman**
- First to try universal screening in 2002

**Brazil**
- Most sites offering hearing screening (267)
SOUND SEEKERS

• To improve access to education, lessen the impact of hearing loss and raise awareness of deaf people’s abilities and needs

- Based in Makeni, Sierra Leone
- 100k grant from Jersey Overseas Aid Commission
- Budget covered equipment, resources, training and a salary for one screener for a year+
Population is approx. 6 million

Makeni is the 4th largest city
Population is approx. 110,000
### SIERRA LEONE IN NUMBERS

<table>
<thead>
<tr>
<th>Category</th>
<th>UK</th>
<th>SL</th>
<th>Uganda</th>
<th>Somalia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population using improved drinking water</td>
<td>100%</td>
<td>60%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>resources:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Population using improved sanitation</td>
<td>100%</td>
<td>13%</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>Nurses/midwives per 10 000 population:</td>
<td>88.3</td>
<td>1.7</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>Male: 79</td>
<td>Male: 45</td>
<td>Male: 50</td>
<td>Male: 50</td>
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<tr>
<td></td>
<td>Female: 83</td>
<td>Female: 46</td>
<td>Female: 55</td>
<td>Female: 55</td>
</tr>
<tr>
<td>Under 5 mortality rate:</td>
<td>5</td>
<td>182</td>
<td>147</td>
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</table>
Established school for the hearing impaired; “St Joseph’s” in Makeni, run by Sister Mary

Ongoing support from retired British Educational audiologist

3 locals already trained in basic audiological procedures and an earmould lab on site

Estimated high prevalence of hearing loss

“No screening should be implemented until appropriate follow-up services are available”. (Gell et al, 1992)
To improve access to education, lessen the impact of hearing loss and raise awareness of deaf people’s abilities and needs.

- Introduce ear care clinics
- Instil safe ear priorities for adults and children
- To improve access to education, lessen the impact of hearing loss and raise awareness of deaf people’s abilities and needs
- Introduce paediatric targeted screen
- Acquire statistics
How can we take care of our ears?

Personal hygiene

DO NOT put dirty fingers in ears, wash hands before working with food and do not eat with dirty hands. ALWAYS wash your hands after going to the toilet.

DO NOT swim or wash in dirty water.

DO NOT put anything in your ears: • hot or cold oil • herbal remedies • liquids such as kerosene

NOTE: ONLY use medicine given by the nurse or doctor at the clinic/hospital and take the correct dosage.
REMEmBER

* Ear Canals need wax to lubricate the skin & prevent dust entering.
* Ear Canals normally clean themselves unless you have had ear canal surgery.
* If you have ear problems keep all water out of your ears. Bacteria are not so happy in a dry environment.
* Poking the ear can damage the skin lining and lead to infections.
* Using a cotton bud in the ear canal may push the wax further into the ear canal and make it difficult to remove.
* Wax in the wrong place in your ear canal can cause itchiness.
* Ears blocked with wax can cause tinnitus, discomfort, pain, whistling and poor performance of hearing aids and hearing loss.
* An olive oil spray will provide a measured dose easily without the risk of ear discomfort to aid in removal of ear wax.
* If you wear ear plugs/defenders at work keep them clean. Every time you remove ear plugs replace them with clean ones.
* Have a regular ear wax check and prevent a major problem.

DON'T IGNORe YOUR EAr PRoBLEM.

The longer you leave it the longer the treatment will take.
The ear problems will only improve with safe treatment.

CArING FOR EArS

Understanding Ear Wax

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EAR CARE

- Visited schools to check children’s ears and do safe practice talks
  - 11 schools visited
  - 1316 pupils attended talks
TARGETED SCREENING: PATHWAY

Government Hospital

Holy Spirit Hospital

Loreto Clinic

St Joseph’s School
GETTING STARTED

- **Equipment:**
  - St Joseph’s already owned:
    - Audiometer
    - Tympanometer
    - Otoscope
    - Sound Level Meter
  - Project funded:
    - 2nd Audiometer/ Tympanometer
    - VRA speakers and reward system
    - Video otoscope
    - 2x Senteiro OAE and AABR machines

- **Rooms:**
  - One “sound-proofed” room already in use at St Joseph’s school
    - VRA equipment set up and calibrated here
  - Further room set up for screening at Loreto Community Centre
    - Acquired furniture including cot, correct equipment and consumables
## JCIH’S RISK FACTORS

<table>
<thead>
<tr>
<th>Year</th>
<th>Risk Factors</th>
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</table>
| 1972 | Family history of childhood hearing impairment  
      | Congenital or perinatal infection  
      | Congenital malformations of the head of neck  
      | Birth weight <1.5kg  
      | Severe hyperbilirubineamia |
| 1982 | Bacterial Meningitis  
      | Severe Asphyxia |
| 1992 | Ototoxic medication  
      | Low Apgar score (poor condition after birth)  
      | Ventilated >5 days  
      | Syndromic features |
| 2000 | Head trauma  
      | Neurodegenerative disorders  
      | ≤48 hours in NICU  
      | Parental concern |
MAKENI’S RISK FACTORS

- JCIH’s risk factors have been widely criticised - evidence suggests around only 50% hearing loss will have a risk factor.
- All based on evidence from UK and USA.
- Nigeria’s hearing screen found consanguinity, maternal hypertension and lack of a skilled attendant at birth as common risk factors.
- More research is needed to put forward risk factors for developing countries.

<table>
<thead>
<tr>
<th>Referral Criteria</th>
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<tbody>
<tr>
<td>Concern re hearing</td>
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<tr>
<td>Family History of hearing loss</td>
</tr>
<tr>
<td>Meningitis</td>
</tr>
<tr>
<td>Cranio-facial abnormalities</td>
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<tr>
<td>Cerebral malaria</td>
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<tr>
<td>Received intravenous quinine/ gentamycin</td>
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TEST BATTERY

- **PTA**: test of choice - screened at 40dBHL at 500Hz - 4kHz
- **TEOAEs**: performed if PTA not appropriate
- **AABR (and tymps)**: carried out at 40 and 70 dB if failed OAE testing

**Pass Criteria:**
- **OAEs**: Present at 3 frequencies at 6dB SNR
- **PTA**: Responses at all 4 freqs in at least one ear
- **AABR**: Response present at 70 and 40dB in one ear, or 40dB in both
Unilateral losses offered follow-up at screening clinic.

Bilateral fails were offered follow-up in 2 weeks at St Josephs for further screening.

2 experienced audiologists available to carry out:

- VRA
- PTA
- AABR
- OAEs

Encouraged to use both subjective and objective measures to reach a diagnosis.
187 children screened so far

15 children failed screen (8%)

13 diagnosed with significant hearing loss (7%)

(2 cases were temporary)
PRESUMED CAUSES

- Perforations
- Mumps
- Cerebral Malaria
- IV Quinine
- Unknown

Reasons for referral:
- Hearing concerns = 11
- Recurrent infections = 1

Average age = 9.3
- Ranged from 2-18 yrs
Results suggest that referrals are only being made when hearing loss is suspected from behavioural observations – risk factors are not being used as indicators for referral.
Or are the risk factors inappropriate?
Difficult to know without looking at all 187 children’s reasons for referral/ risk factors.
7 % is high – but not for a targeted screen.

Recommendations:
- Publicise project to referring health professions to increase numbers.
- Hold training days to educate on the importance of early identification, risk factors and how to refer.
- Start recording the reason for referral for all children.
- Target more rural areas to educate on ear care and hearing loss prevention.
AFTERCARE

- 12 diagnosed with hearing loss:
  - 2 fitted with hearing aids
  - 5 admitted to St Joseph’s school/ nursery
  - 4 due retests
  - 1 did not attend follow-up care

- Difficulties faced:
  - Stigma attached to disability – many decline hearing aids
  - £££££££
  - Staff
  - Level of understanding required to maintain hearing aids
  - Social implications of hearing aids may put infants at risk

- Consequently hearing aids rarely fitted before 3-4 years old.
- Counselling and support groups offered as an alternative to amplification.
Prevalence of hearing loss will have increased as a consequence of Ebola.

Plans for Sajeesh to return when it is safe.

Local nurse to also carry out screening.

More data is needed in order to assess whether the risk factors are appropriate for Sierra Leone.

Best treatment plan for infants must be worked out–hopefully hearing aids can be fitted at a younger age as the service grows and attitudes towards disability change.
POINTS TO TAKE AWAY

- **SUSTAINABILITY**- Will the project survive once your input is removed?

- **GIVE THEM WHAT THEY WANT** – Meetings/ focus groups with local people might reveal different priorities.

- **ONE SIZE DOESN’T FIT ALL**- Every country is different. Apply evidence based practice, but within context.

- **APPROPRIATE INTERVENTION** – Choose the right outcome for that child, in their country and their culture.
REFERENCES


