universal newborn hearing Screening
In various Countries

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The local and international experience

Methods: is compared by review of the literature up to 2007 and some valuable suggestions are sought, to start and improve the local programs.
In 1994, the Joint Committee on Infant Hearing (JCIH) stated that all infants with hearing loss should be identified before 3 months of age and receives intervention by 6 months [5]. Profound bilateral hearing loss Prevalence is 0.1% i.e. more than the sum of all screenable diseases.

**ABSTRACT**

50% not discovered if the screening is limited to the high risk group. Therefore universal screening (i.e. of all newborns) is recommended by the National Institute of Health and the Joint Committee on Infant Hearing in USA and the consensus statement of the audiologists in Europe. WHO 2000: guidelines
1. Delayed speech and language development.

2. Emotional, social, academic difficulties.

Incidence of severe congenital HL

0.1% of live-born infants

1-2% in neonatal ICU’s: -4/-5%
TEOAEs was conducted in a quiet room without sound isolation by audiology technicians or by trained nurses 7 days a week.

II Stage screening was done in 6 weeks ENT examination to rule out CD.

III AABRA at 5 months.

Normal TEOAEs
DISCUSSION

HL of 35-40dB — 50% conversation Loss

^ early D and TT

Screening high risk neonates:
50% detection only

<table>
<thead>
<tr>
<th>AABR</th>
<th>TEOAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>97% (Near) 90%</td>
</tr>
<tr>
<td>Function Reflection</td>
<td>VIII- Cochlea mid brain</td>
</tr>
<tr>
<td>Objective</td>
<td>+ +</td>
</tr>
<tr>
<td>Time</td>
<td>10-13 min. 7-10 min.</td>
</tr>
<tr>
<td>Done by</td>
<td>Trained Personnel</td>
</tr>
<tr>
<td>Cost</td>
<td>Increased Decreased</td>
</tr>
</tbody>
</table>
A survey of childhood hearing impairment in Saudi Arabia: 13.9% *

Prevalence in provinces:

<table>
<thead>
<tr>
<th>Province</th>
<th>HL</th>
<th>First cousins</th>
<th>Relative parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>14.7%</td>
<td>16.5%</td>
<td>12.42%</td>
</tr>
<tr>
<td>Southern</td>
<td>20.7%</td>
<td>39.5%</td>
<td></td>
</tr>
</tbody>
</table>

Statistical data from Ministry of Health in 1966: 412,819 deliveries.


**Incidence:** Increased in geographical areas of increased consanguinity

**Cost:** The cost of not identifying hearing impairment in one person may reach one million dollars in the U.S.A.
Comparison of universal newborn hearing screening programs in Illinois hospitals (IJP-ORL, 07)

Lia M. Ferro a, Dhar .

59 of the 140 hospitals with UNHS programs responded to the Web-based ...

**Staff:**

- 1. Nurses, 2. technicians, usu.
  performed initial hearing screenings in both the well-baby nursery (WBN) & NICU).
- Audiologists usu. for re-screenings, usu.
How?:

1. Automated ABR (80%),
2. Distortion Product OAEs (32%),
3. Transient Evoked OAEs (5%).

86% reported referral rates > 5%, with 32% reporting a referral rate less than 1%.

Illinois - Conclusions:

At the beginning of 2004, 99% of all infants born in Illinois were being screened for hearing loss. Personnel involvement and screening measures were comparable to other states. The audiologist’s role was found to be fairly limited in screening, re-screening, or managing UNHS programs.
Referral rates were consistent with national standards (1%). Management of UNHS programs in small, rural facilities, tracking/monitoring high-risk infants, and other services provided to families emerged as areas with room for improvement.

Brainstem auditory evoked response in neonatal neurology, (Seminars in Fetal & Neonatal Medicine, 06, 11).

andrew R. Wilkinson*, ze d. jiang, UK
- The maximum length sequence (MLS) technique: recently incorporated into neonatal BAER (BERA) studies.
- can improve the diagnostic value of BAER in some clinical situations,
- (wider utility remains to be further explored).

- BAER is very suitable in very young or sick infants.
- It is the major tool to detect hearing impairment in high-risk infants, also
- a valuable DD to detect neurological impairment and diseases.
Early hearing detection at immunization clinics in developing countries
Bolajoko O. Olusanya, Nigeria. IJP ORL:4,06

Here births occur usu. outside hospitals:
* we need practical and culturally appropriate options for early hearing detection: (eg. South Africa, ..) UNHS is feasible if integrated into early childhood immunization programs:

BCG: the highest uptake of all the vaccinations (data from UNICEF and the WHO) given at birth (/at 3W12 months) in 157 countries in 2002; coverage: above 90% in 101 countries (below 60% in 9 countries).
Our Job: coordin.multi-stage screening protocol, how to minimize default rates for follow-up till diagnosis.

Solutions: systematic by parental education and appropriate support at various stages of the program.

Neonatal hearing screening with transient evoked otoacoustic emissions in Western Saudi Arabia
H.S. Habib a,*, H. Abdelgaffar

12000 newborn well babies are screened by transient Evoked Otoacoustic Emissions (TEOAE) before discharge in 1-2/5 days. Exclusions: NICU. Screening is done in 3 stages by transit TEOAE’s in 6 weeks intervals and confirmed by Automated ABR at 5 months.
41.4% male, 58.6% female (7000).

I A: of 11986 screened
Failed age Passed

1-2 days 1043 10943 (91.3%) (8.7%)

300 (29%) 5 days B: 1043
5 months 22 II: 278

4: from 12000:20 (bilateral sensorineural hearing loss) BPHL: 0.16%
2 bilateral mild HL
2 unilat. SNHL

sex specific incidence: M = F
All Saudi with parental consanguinity
Table 1 The degree of hearing loss in the 22 neonates that was picked by the screening program.

<table>
<thead>
<tr>
<th>Total number</th>
<th>M</th>
<th>F</th>
<th>Degree of HL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>1 Mild loss</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>1</td>
<td>3 Moderate loss</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>3</td>
<td>4 Severe loss</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>4</td>
<td>5 Profound loss</td>
</tr>
</tbody>
</table>

CONCLUSIONS

incidence of congenital HL in the western of Saudi Arabia: \( 0.17\% \) (> international figures: \( 0.1\% \))
CONCLUSIONS

Results

Saudi Arabia must apply universal newborn hearing Screening in all hospitals & primary care centers by using Evoked Oto-Acoustic Emissions 7 days a week.

- BERA: alone/ for the final screening-stage by an audiologist.
- Screen to SAVE thousands: prevent the disastrous consequences (personal, social, educational, emotional and financial) to thousands added annually,
  - Immunisation program- Birth certificate: include Hearing Screening to avoid drop-downs beside,
  - follow-up officers in tertiary care hospitals
THANKS & for UR ROLE