OTOTOXICITY: A REMINDER TO THE MENACE OF SILENT DISASTER.

By

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INTRODUCTION

• Ototoxicity, damage to the cochlea or vestibular apparatus from exposure to a chemical source.¹

• syphilitic mercury
  • vertigo, deafness, tremors, and “madness”.²

• Waksman's discovery 1944
  • Streptomycin
  • Irreversible cochlear and vestibular toxicity.³

• Classification.
  • Aminoglycosides, Antimalarials etc
  • Cochleotoxic, Vestibulotoxic and both⁴

• Tinnitus, Hearing loss, Vertigo, Hyperacusis, Oscillopsias.⁶,⁵,⁶
FIG 1. HAIR CELL
Aminoglycosides
INTRODUCTION

• Days, weeks, or months later
  – features of ototoxicity.

• Physician may feel fulfilled
  – care of primary diseases.

• This review aims to highlight the pattern of Ototoxicity seen in Aminu Kano Teaching Hospital, Kano.
MATERIALS AND METHODOLOGY

• Clinical notes, hearing abnormalities subjected to audiology were reviewed

• January, 2007 - December, 2011 at Otorhinolaryngology Department of AKTH.

• Bio-data, causes of deafness, vertigo and other risk factors

• Those with conductive loss were excluded.

• Data analysed - Epi info version 3.5.1 software
RESULTS

- 1,175 patients with Deafness who had audiological assessment reviewed

- Out of which, $683(58\%)$ had Sensorineural hearing loss (SNHL).
  - consisting of 441 (64.7%) males and 241 (35.3%) females
  - Over 5 year period (2007 – 2011)

- Their ages range from 1.0 - 90.0 years
  - with mean of 26.85 years $\pm$ 19.75
TABLE 1: YEARLY DISTRIBUTION CHARACTERISTICS OF PATIENTS EVALUATED.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HEARING IMPAIRED</th>
<th>CHL</th>
<th>SNHL</th>
<th>DRUG INDUCED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>213</td>
<td>30</td>
<td>183</td>
<td>71</td>
</tr>
<tr>
<td>2008</td>
<td>197</td>
<td>95</td>
<td>102</td>
<td>16</td>
</tr>
<tr>
<td>2009</td>
<td>189</td>
<td>90</td>
<td>99</td>
<td>22</td>
</tr>
<tr>
<td>2010</td>
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<tr>
<td>2011</td>
<td>275</td>
<td>140</td>
<td>135</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>1175</td>
<td>492</td>
<td>683</td>
<td>305</td>
</tr>
</tbody>
</table>
RESULTS cont.

- 682 (58%) had Sensorineural Hearing loss

- 305 (44.72%) suspected drug induced

- 16 (5.25%) clear ototoxicity while

- 289 (94.75%)- associated/additional risk factors
FIG. 2: ASSOCIATED RISK FACTORS

- Meningitis
- Febrile illness
- Hypertension
- Children
- Elderly
- Renal disease
- Traditional concoction

 Frequencies: 40.00%, 35.00%, 30.00%, 25.00%, 20.00%, 15.00%, 10.00%, 5.00%, 0.00%
FIG. 3: DISTRIBUTION OF PATIENTS BY RELIGION

- Christianity: 86.00%
- Islam: 12.70%
- Others: 0.80%
- Traditional: 0.40%

Legend:
- Christianity
- Islam
- Others
- Traditional
FIG. 4: DRUGS INVOLVED

- Chloroquine: 31%
- Furusemide: 25%
- Gentamicin: 14%
- Streptomycin: 13%
- Tryptizol: 19%


DISCUSSION

• Epidemiological data

  – ototoxic deafness / HI

  – magnitude not known.$^7$

➢ Hence, extensive analysis and comparison of findings will be limited.
DISCUSSION

• Studies

• ototoxicity
  – 2-20% of hearing loss in children. \(^8,^9\)

• In Tanzania,
  – ototoxicity was noted to be the
  – 2\(^{nd}\) cause of deafnessn.\(^10\)
DISCUSSION cont.

- A National Survey
  - Italy and China
  - Ototoxicity of 1.9% and 3.7% respectively. ⁹

- This study found 5.25%
  - sensorineural hearing loss to be
  - due to ototoxicity.
DISCUSSION cont.

• The higher figure
  – hospital based
  – A referral tertiary centre
  – considered sensorineural hearing loss cases.
DISCUSSION cont.

• We found the
  • commonest ototoxic - chloroquine

• other studies found
  – injectable aminoglycosides
    • Commonest.\textsuperscript{11,12}
  – Chloroquine
    • OTC drug for treatment of malaria
    • majorly referred
    • Low cost
DISCUSSION cont.

• Furthermore,
  – high prevalence of malaria,

  – widespread resistant malaria,

  – repeated doses and

  – higher does of chloroquine
Nevertheless,

- this study found 12.5% streptomycin.
- low cost,
- Availability without prescription and
- effectiveness against gram negative bacteria and mycobacterium.
DISCUSSION cont.

• *HIV/AIDS*,
• *Tuberculosis and*
• *streptomycin regimes*
• *more cases of ototoxicity.*
• *TB are treated at IDH Hospital,*
  – *ototoxicity might be higher.*
DISCUSSION cont.

• **SNHL - commonest presentation of ototoxicity in this study.**

• **common finding worldwide.**¹³

• **hearing loss may be permanent**
  – irreversible destruction of the outer hair cells of the organ of corti
DISCUSSION cont.

• risk of occurrence of ototoxicity\textsuperscript{14}.

• This found 94.75\% of cases of ototoxicity
  
  – The commonest- preceding history of CSM in
  
  – 34.4\% of cases.
DISCUSSION cont.

• *The leading role of meningitis*
  
  – *the high prevalence*
  
  – *lies in the meningitis belt*
  
  – *Although, it is not clear SNHL seen in post meningitis patients and febrile illness cases*
  
  – *primary disease or drug therapy.*
CONCLUSION

• High prevalence
  – 5.25% of ototoxicity amongst patients attending AKTH.

• The commonest ototoxic agent
  – chloroquine (31.25%).

• Most (94.75%) cases of ototoxicity in AKTH
  – associated risk factors such as meningitis.
RECOMMENDATIONS

• Health education: create awareness – prescribers/patients

• Visiting certified professional before use of medication

• Use of alternative drugs - proven ototoxic potentials.
• And if ototoxics – monitore serum levels,
  - audiometric assessment before, during and after treatment advised.
• Cautious use or outright avoidance in patients with proven risk factors
REFERENCES


REFERENCES contd


THANK YOU FOR LISTENING