Sudden Sensorineural Hearing Loss (SSNHL)
Management Protocol
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Dr. Walid Karrar
Definition

Sudden Sensorineural Hearing Loss (SSNHL) is defined as

1. Sudden onset, occurring over 3 days period.
2. Sensorineural hearing loss in one or both ears.
   • Audiometric decrease in hearing of ≥30 decibels (dB), affecting at least 3 consecutive frequencies.
   • Indicates an abnormality of the cochlea, auditory nerve, or higher aspects of central auditory perception or processing.

• This definition assumes that the premorbid hearing level in each ear was either normal just prior to the episode of SSNHL or that premorbid hearing loss was symmetrical in each ear. Clinicians must decide that the hearing loss in the poorer ear is “new.”
SNHL indicates an abnormality of the cochlea, auditory nerve, or higher aspects of central auditory perception or processing.

Idiopathic SSNHL is defined as SSNHL with no identifiable cause despite adequate investigation.

Acquired SSNHL if the cause is identifiable.
Background

• First described in 1944 by DeKleyn but its etiology is still unclear.

• Represents an **Otologic emergency** and early therapy is critical to recovery.

• **Spontaneous recovery**
  1. **Partial** has been documented from 32% - 79%, usually within two weeks of onset.
  2. **Complete** documented in 36%
Incidence

• The incidence estimated to be \((5 - 20 \text{ per } 100,000)\), with \(4,000\) new cases reported per year in the U.S. and \(15,000\) annually worldwide, accounting for approximately \(1\%\) of all cases of SNHL.

• The incidence increased with age, ranging from
  1. \(11\) per \(100,000\) for patients \(18\) years and younger.
  2. \(77\) per \(100,000\) for patients \(65\) years and older.

• There was an overall slight male preponderance with a male-to-female ratio of \(1.07:1\).

• Prevalence studies do not necessarily distinguish between idiopathic and acquired SNHL, most cases of spontaneous SNHL have no identifiable cause.
Incidence

- A cause for SSNHL is identified in only 10% to 15% of patients at the time of presentation.\(^7,9\)

- In up to a third of cases, the cause may be identified only after long term follow-up evaluations.\(^10\)

- Emergency intervention may be needed for rare, life-threatening conditions of which SSNHL is a part.
Potential Causes of SSNHL

- Viral infection
- Bacterial infections
- Autoimmune disorders
- Neurologic disorders
- Neoplasms
- Ototoxic drugs
- Psychogenic causes
Suggested Aetiologies ISSNHL

- Labyrinthine viral infection
- Labyrinthine vascular compromise
- Intracochlear membrane ruptures
- Immune-mediated inner ear disease.

NB: Each theory may explain a fraction of the episodes of sudden sensory hearing loss, but none of the existing theories individually could account for all episodes
Viral infection

Most widely accepted:

- 25% to 63% of patients have viral URTI prior to onset of hearing loss.
- Similar histological findings in patients who experienced ISSHL to those cases of hearing loss secondary to mumps, measles, and maternal rubella, which include:
  1. Loss of hair cells and supporting cells.
  2. Atrophy of the tectorial membrane.
  3. Atrophy of the stria vascularis, and neuronal loss were observed.

- Animal experiments have confirmed that the inner ear may be penetrated by viral agents.
Viral infection

Non Specific :-
• 1. Viral cochlear labyrinthitis
• 2. Viral vestibular labyrinthitis
• 3. Viral vestibulocochlear labyrinthitis
• 4. Viral neuritis, auditory nerve
• 5. Viral polyneuropathy (including Ramsay-Hunt syndrome)
• 6. Viral-induced meningoencephalitis

Specific viruses: Mumps, CMV, rubella, rubeola, varicella zoster, HSV I, HSV II, parainfluenza A, B, and C, Lassa fever (arena virus), EB virus, HIV.
Labyrinthine vascular compromise

• Impairment of the blood supply to the cochlea which is an end organ with respect to its blood supply:

• With:
  - Presentation similar to cerebral infarcts.
  - Association of SSNHL with various vascular disorders.
    - In 1959, Perlman demonstrated the loss of cochlear microphonic 60 seconds after occlusion of the labyrinthine artery in guinea pigs.
    - In one study, a partial overlap was found between classical coronary risk factors and risk factors for sudden hearing loss.

• Against:
  - Controversy around the histopathological features associated with SSNHL and vascular insults of the cochlea.

• NB: Histopathology cochlear (perilymph) duct fibrosis.
Vascular Compromise

1. Partial Obstruction
   • a. High-viscosity syndromes: macroglobulinemia, polycythemia vera, decreased blood filterability
   • b. Small vessel obstruction: sickle cell anemia, microemboli, bubble (caisson disease)
   • c. Small vessel narrowing: diabetes mellitus, atherosclerosis, Buerger's disease (thrombangitis obliterans)
   • d. Hypercoagulability states
   • e. Vasospasm.

2. Complete Obstruction: thrombus or embolus of labyrinthine or cochlear artery; microemboli secondary to routine or pump bypass surgery.

Idiopathic SSNHL vascular or viral?
Linthicum et al. House Research California, Los Angeles, California, USA

• The histopathologic morphology in 7 temporal bones with known vascular impairment due to surgical interventions was compared with that of 11 bones with a history of idiopathic sudden sensorineural hearing loss (ISSNHL), showed no perilymph fibrosis (vascular) and no loss of ganglion cells (neuronitis)

• Conclusion: SSNHL is most probably from viral cochleitis.
Intracochlear membrane ruptures

1. Intracochlear breaks: Reissner's membrane tear, with and without hydrops (theoretic) would allow mixing of perilymph and endolymph, effectively altering the endocochlear potential.

2. Oval window and round window membrane tears or rupture of either or both sets of membranes theoretically could produce a sensory hearing loss.
   • a. Secondary to head injury
   • b. Compression or decompression of ear
   • c. Post-stapedectomy
   • d. Secondary to congenital malformation
Immune-mediated inner ear disease

• Sensorineural hearing loss induced by an immune process has gained interest since the concept was introduced in 1979 as:
  1. Progressive sensorineural loss is observed with this condition.
  2. Cross-reaction of antibodies (usually virally induced) with native antigens of the inner ear similar to autoimmune inner ear disease.
  3. The association of hearing loss and autoimmune diseases, has been well documented. In one prospective study on 51 patients with ISSNHL supported the existence of multiple immune-mediated disorders such as inner ear autoimmune disease, ulcerative colitis, relapsing polychondritis, lupus erythematosus and Polyarteritis nodosa.

• Whether or not sudden hearing loss occurs with immune-mediated inner ear disease is still unclear.
Acquired SSNHL (Bacterial infections)

1. Meningitis, labyrinthitis secondary to chronic ear infection or surgery.

2. Syphilis, primary through tertiary stages.
Neurologic disorders

1. Multiple sclerosis.

Neoplasms

1. Vestibular schwannoma (acoustic neuroma)

2. Metastatic cancer

3. Paraneoplastic disorders.
Psychogenic causes

1. Malingering

2. Converse reaction.
Presentation

- Acute onset hearing loss of **nonspecific** symptom of a full or blocked ear or a “pop” in the affected ear when awakening from sleep just prior to hearing loss.

- May be accompanied by tinnitus.

- Mostly unilateral, bilateral 2% (systemic disease must be ruled out).

- Left side has been documented as having a slightly higher incidence (55%).

- The median age of onset is from 40 to 54 years.
Prognosis

Prognosis for recovery is dependent on a number of factors, including

1. Patient age.
2. Presence of vertigo at onset.
3. Degree of hearing loss.
4. Audiometric configuration.
5. Time between onset of hearing loss and treatment.7-9

*Nb:* There is no definite conclusion for these variables from published papers
Prognosis

Sudden SNHL

Natural History:

The natural history of untreated patients with sudden SNHL ranges from recovery rates of 31% to 65%, (1) (3) (4) (8)

Treatment

The range of hearing recovery reported in the literature in treated patients ranges from 35% to 89%.


Challenge of finding out the benefit of a given treatment
Treatment

The comparative efficacy of these treatments is not known and

Regimens Include

• **Anti inflammatory agents** (Systemic and local steroids).
• Antiviral agents.
• Vasodilators
• Hyperbaric oxygen therapy.
• **Rheological agents** (altering blood viscosity like dextran and other anticoagulants).
• **Diuretics** ( ? Hydrops)
• **Middle ear surgery for fistula repair** (if associated with positive fistula test).
• Observation alone.
• Stem Cell.
Anti inflammatory (Corticosteroids)

• Clinicians may offer corticosteroids as initial therapy to patients with ISSNHL.

• Offer the greatest recovery if given in the first 2 weeks, but benefit has been reported till 6 weeks.

• Evidence quality: Grade B (systematic reviews of RCT methodological limitations)
Actions of Steroids on the Cochlea

- Both glucocorticoid and mineralocorticoid receptors are found in the inner ear.
- Decrease inflammation from labyrinthitis
- Improve cochlear blood flow

References:

Actions of Steroids on the Cochlea

- protect against cochlear ischemia,
- protect against noise induced hearing loss
- improve stria vascularis function and morphology

References:
Actions of Steroids on the Cochlea

- Reduce hearing loss in Meningitis (cochrane)
- Prevent loss of spiral ganglion neurons
- Modulate Na+/K+ in Endolymph
- Regulate transcriptional factors (AP-1)
- Ototoxicity


### Table 9. General Guidelines for Corticosteroid Therapy for Idiopathic Sudden Sensorineural Hearing Loss (ISSNHL)³

<table>
<thead>
<tr>
<th></th>
<th>Oral Corticosteroids</th>
<th>Intratympanic Corticosteroids</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timing of treatment</strong></td>
<td>Immediate, ideally within first 14 days. Benefit has been reported up to 6 weeks following onset of sudden sensorineural hearing loss (SSNHL)</td>
<td>Immediate Salvage (rescue) after systemic treatment fails</td>
</tr>
<tr>
<td><strong>Dose</strong></td>
<td>Prednisone 1 mg/kg/d (usual maximal dose is 60 mg/d) or Methylprednisolone 48 mg/d or Dexamethasone 10 mg/d</td>
<td>Dexamethasone 24 mg/mL or 16 mg/mL (compounded), or 10 mg/mL (stock) Methylprednisolone 40 mg/mL or 30 mg/mL</td>
</tr>
<tr>
<td><strong>Duration/frequency</strong></td>
<td>Full dose for 7 to 14 days, then taper over similar time period</td>
<td>Inject 0.4 to 0.8 mL into middle ear space every 3 to 7 days for a total of 3 to 4 sessions</td>
</tr>
<tr>
<td>Technique</td>
<td>Do not divide doses</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td>Audiogram at completion of treatment course and at delayed intervals</td>
<td></td>
</tr>
<tr>
<td>Modifications</td>
<td>Medically treat significant adverse drug reactions, such as insomnia. Monitor for hyperglycemia, hypertension in susceptible patients</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anterosuperior myringotomy after topical anesthetic. Inject solution into the posterior inferior quadrant via narrow-gauge spinal needle to fill middle ear space. Keep head in otologic position (one side down, affected ear up) for 15 to 30 minutes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Audiogram before each subsequent injection, at completion of treatment course, and at delayed intervals. Inspect tympanic membrane (TM) to ensure healing at completion of treatment course and at a delayed interval.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>May insert pressure-equalizing tube if planning multiple injections, but this increases risk of TM perforation. May consider adding round window transport facilitator.</td>
<td></td>
</tr>
</tbody>
</table>
Which steroid??

<table>
<thead>
<tr>
<th>Steroid type</th>
<th>Equivalent dose (mg)</th>
<th>Relative anti-inflammatory</th>
<th>Duration of action (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endogenous cortisol</td>
<td>20</td>
<td>1</td>
<td>8 - 12</td>
</tr>
<tr>
<td>Hydrocortisone</td>
<td>20</td>
<td>1</td>
<td>8 - 12</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>5</td>
<td>4</td>
<td>12 - 36</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>4</td>
<td>5</td>
<td>12 - 36</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>0.75</td>
<td>30</td>
<td>36 - 72</td>
</tr>
</tbody>
</table>

Highest perilymph concentration and half life
IT Corticosteroids

• Higher perilymph concentration, lesser systemic side effects

• Equally effective as systemic steroid

• Adverse effects:
  – Transient pain at the injection site
  – Caloric vertigo
  – Persistent TM perforation
Challenges for IT steroids

– Not well established as primary treatment strategy

– Dosing?

– Best delivery technique?

– Long term effects?

• In a guinea pig model, the concentrations of hydrocortisone, dexamethasone, and methylprednisone in plasma, endolymph, perilymph, and CSF were compared when administered orally, intravenous, and IT.

  – Dexamethasone 26.7 times more potent than hydrocortisone.

  – Methylprednisone 5.3 times more potent than hydrocortisone.
Parnes (1999) Potency corrected levels in perilymph and endolymph (respectively) after IT administration
What about using both together?

Battaglia \(^{16}\) did a placebo controlled, prospective trial looking at this question.
## IT Methylprednisolone

<table>
<thead>
<tr>
<th>Group</th>
<th>Study</th>
<th>Delivery</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xenelis (2006)</td>
<td>Prospective, controlled</td>
<td>Injection</td>
<td>47% (PTA)</td>
</tr>
<tr>
<td>Slattery (2005)</td>
<td>Prospective</td>
<td>Injection</td>
<td>55% (PTA/SDS)</td>
</tr>
<tr>
<td>Banerjee (2005)</td>
<td><em>Retrospective review</em></td>
<td>Via PET</td>
<td>69%, ≤10 days (PTA)</td>
</tr>
<tr>
<td>Kopke (2001)</td>
<td>Prospective</td>
<td>Microcatheter</td>
<td>100%, ≤6wk (PTA/SDS) 0% &gt;6wk</td>
</tr>
</tbody>
</table>
## IT Dexamethasone

<table>
<thead>
<tr>
<th>Group</th>
<th>Study</th>
<th>Delivery</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banerjee (2005)</td>
<td><em>Retrospective review</em></td>
<td>Via PET</td>
<td>31%, &gt;10 days</td>
</tr>
<tr>
<td>Batista (2005)</td>
<td>Prospective, PSSNHL</td>
<td>Injection</td>
<td>20% (PTA)</td>
</tr>
<tr>
<td>Guan-Min (2004)</td>
<td>Prospective, randomized, controlled</td>
<td>Injection</td>
<td>53% Treatment (PTA) 7% Control</td>
</tr>
<tr>
<td>Silverstein (2002)</td>
<td>Academy Presentation</td>
<td>MicroWick</td>
<td>23% (PTA) 35% (SDS)</td>
</tr>
<tr>
<td>Gianoli (2001)</td>
<td>Prospective</td>
<td>Via PET</td>
<td>44% (PTA)</td>
</tr>
</tbody>
</table>
Antiviral

• **Cochrane review 2012**, 4 RCT (257 participants)

• There is currently no evidence to support the use of antiviral drugs in the treatment of ISSHL.

PMID: 22895957 [PubMed - indexed for MEDLINE]
Vasodilators and vasoactive substances

- Theoretically improve blood supply to cochlea and reversing hypoxia and include histamine, carbogenic (5% CO2) treatment.

- Cochrane Database Syst Rev. 2009, 3 RCTs (189 participants) of vasodilators/vasoactive sub. vs placebo.

- The effectiveness of vasodilators in the treatment of ISSHL remains unproven.
Hyperbaric Oxygen Therapy (HBO)

• Clinicians may offer HBOT within 3 month of diagnosis of ISSNHL.

• HBOT improves oxygen supply to the inner ear and result in an improvement in hearing.

Results are better if HBOT was performed within 2 weeks of acute onset with potentially more benefit noted in cases of severe to profound loss.
HBO


- For patients with acute ISSHL, the application of HBOT significantly improved hearing.

- There is no evidence of a beneficial effect of HBOT on chronic ISSHL.
Other Treatment Options

• Rheologic agents: Altering blood viscosity like dextran and other anticoagulants (?) efficacy.

• Diuretics: once Hydrops is suspected as a cause.

• Middle ear surgery (fistula repair), suspected in barotrauma and head injuries with positive fistula test.
Observation alone.

- **Spontaneous recovery**

1. **Partial** has been documented from 32% - 79%, usually within two weeks of onset.

2. **Complete** documented in 36%
Stem Cell

• Hair cell regeneration using stem cell and gene therapy is years or decades away from being clinically feasible.\[^4\]

• However, studies are currently underway on the subject, with the first FDA-approved trial beginning in February 2012.\[^5\]
Why the Protocol for Sudden Hearing Loss?
Key points

1. Early Prompt and accurate diagnosis.
2. Unnecessary tests and treatments should be avoided.
3. Retrocochlear workup should be performed in all patients with ISSNHL (MRI, CT, ABR), regardless of hearing recovery.
4. Initial therapy for ISSNHL may include corticosteroids.
   a. Corticosteroids systemically or via intratympanic application.
   b. Hyperbaric oxygen, currently not FDA-approved for this indication, may be offered.
5. Doctors should offer intratympanic steroid perfusion when patients have incomplete recovery from ISSNHL after failure of initial management.
6. Follow-up and counseling is important
Protocol

• Confirmation of the diagnosis.

• Treatment

• Outcome assessment and Hearing rehabilitation.
Diagnosis of ISSNHL

• SNHL (exclude CHL)

• Sudden (within 3 days of onset, no prior history of hearing loss)

• Idiopathic by exclusion of other specific causes of SNHL.
History & Examination

• **History**
  
  History of trauma, external ear and canal pain, ear drainage, fever, or other systemic symptoms (CHL).
  History of tinnitus, ear fullness or pressure, and vertigo (SSNHL) however, may also be present in CHL.

• **Physical exam** (including tuning fork)
  
  Patients with SNHL will almost always have a normal otoscopic examination, whereas examination of patients with CHL will often show abnormalities (e.g. impacted wax, perforated tympanic membrane)
• History

• Examination
Features Often Associated with Specific Disorders Underlying Hearing Loss

- Sudden onset of bilateral hearing loss
- Antecedent fluctuating hearing loss on one or both sides
- Isolated low-frequency hearing trough suggesting Meniere disease
- Concurrent onset of severe bilateral vestibular loss with oscillopsia
- Accompanying focal weakness, dysarthria, hemiataxia, encephalopathy, severe headaches, diplopia
- Downbeating or gaze-evoked nystagmus
- Brain imaging indicating stroke or structural lesion likely to explain the hearing loss
- Severe head trauma coincident with the hearing loss on one or both sides
- Recent acoustic trauma
- A history of concurrent or recent eye pain, redness, lacrimation, and photophobia
Exclusion of Specific Disorders Underlying Hearing Loss

• Assess patients with presumptive sudden sensorineural hearing loss for:
  1. Focal neurologic findings
  2. Bilateral sudden hearing loss
  3. Recurrent episodes of sudden hearing loss
SHL with Focal Neurological Findings

• AICA occlusion
  – Commonest SHL cause with stroke
  – HL+ vertigo
  – Horner syndrome
  – Diplopia
  – Ataxia
  – Facial palsy
• Multiple sclerosis
Conditions Associated with Bilateral Sudden Hearing Loss

- **Meningitis**  Headache, fever, CN pasies.
- **Autoimmune inner ear disease**  Fluctuation of hearing.
- **Syphilis**  Tabes dorsalis, multiorgan involvement.
- **Ototoxic medications**  Vestibular loss, oscillopsia.
- **Trauma**  Head trauma, barotrauma.
- **Herpes zoster oticus**  Otalgia, pinna and/or ear canal vesicles.
- **Genetic disorders**  May be syndromic or nonsyndromic
Recurrent episodes of sudden hearing loss

- Meniere disease  (commonest 22).
- Autoimmune inner ear disease
- Cogan syndrome
- Hyperviscosity syndromes
AUDIOMETRIC CONFIRMATION of ISSNHL

• Confirmation of the diagnosis of ISSNHL:
  When audiometry confirms a 30-dB hearing loss at 3 consecutive frequencies within 3 days AND an underlying condition cannot be identified by history and physical examination, then the diagnosis of ISSNHL is confirmed.
Laboratory investigation

• Routine laboratory tests in patients with ISSNHL are not recommended as they do not improve management of patients but nonetheless have associated cost and potential harms related to false-positive results, false-negative results, or both.

• NB:- Lab tests should be ordered once an underlying cause is suspected as directed by history and physical exam.
Radiological investigation

• Aim to identify retrocochlear or other CNS pathology by obtaining an MRI or ABR.

• CT has potential adverse events, which include radiation exposure and side effects of iv contrast, while offering no useful information that would improve initial management.

• It should be considered when MRI or ABR is not possible.
MRI

- 10-20% of patients with VS reports a SSNHL

- The rate of VS in patients who present with SHL is somewhat about 3%
Initial treatment

Salvage treatment

Hearing Rehabilitation
SSNHL is an Otological emergency thus should be managed promptly and as soon as possible
Salvage treatment

- Clinicians should offer IT steroid perfusion when patients have incomplete recovery from ISSNHL after failure of initial management.

- Majority of studies: Hearing improvement occurred in 50% to 90% of patients
Outcome assessment

- Clinicians should obtain follow-up audiometric evaluation within 6 months for final hearing level.
Siegel’s criteria for hearing improvement

• Complete recovery was defined as more than 30 dB hearing gain and as final hearing better than 25 dB.

• Partial recovery as more than 15 dB hearing gain and as final hearing between 25 and 45 dB.

• Slight improvement as more than 15 dB hearing gain but with a final hearing poorer than 45 dB.

• No improvement as less than 15 dB hearing gain and final hearing poorer than 75 dB.
Wilson’s criteria for hearing improvement

- **Complete**: PTA (dB HL) within 10 dB HL of initial HL or within 10 dB HL of the HL of the unaffected ear.

- **Partial**: PTA (dB HL) within 50% of initial HL or >10-dB HL improvement of the HL.

- **No recovery**: <10-dB HL improvement in HL relative to the initial HL.
Hearing Rehabilitation
Hearing impairment management options

• **Air conduction devices**
  A-Traditionally recommendations are the CROS, in case of normal hearing in better ear.
  B-Bilateral contralateral routing of signals (BICROS) if there is a preexisting hearing loss in better ear.

• **Bone conductive devices**
  A-Osseointegrated devices (surgery)
  B-Head band placement is available, if surgery is not an a desired option.
  C-Cochlear implantation.
Rehabilitation

- Clinicians should counsel patients with incomplete recovery of hearing about the possible benefits of amplification and hearing-assistive technology (HAT).

- Tinnitus Counseling
The Protocol
Hearing loss
With in 3 days

yes

History of ear pain, discharge, fever

yes

CHL- Proceed with examination and manage accordingly

No
Hearing loss

With in 7 days

NO

CHL
Wax, porforated TM

Proceed with examination and triage accordingly

Yes

Physical Examination - (Normal Otoscopy)

Audiogram confirmed SNHL
NO

Hearing loss
With in
7
days

History of
ear pain,
discharge,
fever

CHL
- Proceed with
examination and
triage accordingly

NO

CHL

PTA>
30

Over
3
consicutive
frequency

SNHL

yes

EXCLUDED SNHL

#COMPLETE HISTORY+ADEQUATE EXAMINATION

-Focal neurologic defect
-Bilateral or fluctuating HL
-Reccurent episodes of HL
-H/O Bacotrauma or Head trauma
-Ototoxic Medication
-Downbeating nystagmus
-Ataxia,dysarther
-Diplopia,severe headache,
-Cranial nerve palsies

POSITIVE

IDENTIFIABLE CAUSE
IS LIKELY PRESENT
(NOT IDIOPATHIC)
MANAGE
ACCORDINGLY

NEGATIVE
Investigations are targeted by history and physical examination. It includes:

- CBC, LFT (General)
- VDRL, FTA, RPR (Syphilis)
- ESR, RF, ANA, Immunoglobulin profile (autoimmune)
- ELISA (HIV)
- Western blot 68kd inner ear protein (autoimmune inner ear disease)
- TFT (Hypothyroidsm)

**MRI to rule out CPA tumour,** if N/A ABR, If N/A then CT scan
TREATMENT

• **IN CASE**
  - No contraindication for systemic steroids
  - No Uncontrolled systemic illness (eg, HTN, DM)
  - Pt counselled about systemic steroids (benefits and risks) and informed consent taken.

**yes**
Prednisolone 1mg/kg/day for 14 days then tapering over 5 days (Total 19 days), PTA done every 3 days and at end of treatment (Day 19).

- Partial or no recovery OR
- Pt agreed for combination therapy initially

Intratympanic injection, dexamethasone 4mg/1ml (use higher if available), 1ml injected into anteroinferior quadrant TM 3 times over 1 week.

Complete Recovery

Incomplete Recovery

Hearing Rehabilitation (After 3 month)
Messages

- SSNHL is an Otologic emergency
- R/O retro cochlear pathology, MRI
- Systemic steroids are mainstay of therapy
- IT steroids may be an alternative for initial treatment
- HBO is beneficial if started early for severe deafness
- IT steroids is useful for salvage treatment
- Hearing rehabilitation after 3 months improves QOL
• 9-Inner Ear, Sudden Hearing Loss - Emedicine Medscape SHL, Neeraj N Mathur, Mar 2012.


THANK YOU