Reversible Sudden Sensory Neural Hearing Loss – A Case Report

[1]Sundara Raju H. & [2]Rajeshwari G.

Abstract

Idiopathic sudden sensorineural hearing loss is a clinical diagnosis characterized by a sudden deafness of cochlear or retro cochlear origin in the absence of clear precipitating factor. Most often it is taught irreversible. If it is identified early and medical intervention is done it shows a good prognosis. Factors affecting prognosis include age, presence of vertigo, unilateral or bilateral pathology, associated systemic diseases and time duration between the onset of symptoms and treatment. The main stay of treatment includes corticosteroids, anti-inflammatory drugs, neurovitamins, antioxidants, carbogen therapy and adequate control of systemic illness. Sudden Sensori Neural Hearing Loss through rare it is one of the medical emergency in otologists practice. Intra tympanic injection of steroids is one of the common accepted methods of management. I am a reporting a case of sudden sensori hearing loss where oral steroid therapy is also equally effective in certain cases if the hearing loss is unilateral and if the patient is of younger age group and if the patient is without any systemic illness.

Key words: Sudden sensory neural hearing loss, Reversible sensory neural hearing loss, Calorie test, Steroids.

Idiopathic sudden sensorineural hearing loss (ISSHL), characterized by new-onset unilateral or bilateral hearing loss that develops rapidly within 24 to 72 hours, remains a diagnostic and therapeutic challenge for the clinician. The cause and pathogenesis of ISSHL remain unknown. Proposed theories of the pathogenesis of ISSHL include viral cochleitis (1), vascular occlusion (2), and membrane breaks.

Definitions of sudden hearing loss have been based on severity, time course, audiometric criteria, and frequency spectrum of the loss. A commonly used criterion to qualify for the diagnosis is a sensorineural hearing loss of greater than 30 dB over 3 contiguous pure – tone frequencies. The vast majority of cases of sudden hearing loss are unilateral, and the prognosis for some recovery of hearing is good. Usually sudden sensory neural hearing loss presents as unilateral loss of hearing, bilateral involvement is rare and simultaneous bilateral involvement is very rare.

This case is reported to stress the importance of oral steroid therapy in certain cases of unilateral sensori neural hearing loss in younger age group without any systemic illness.

Methods and Results

A 35 year old male presented with a history of sudden hearing loss in the right side 2 days duration. He had associated symptoms of Tinnitus, Vomiting, Headache, Numbness in the right side of the face.

Hearing loss sudden onset and static in nature Patient did not have any prior history of ear discharge, ear pain. Patient had tinnitus which was intermittent and low pitched.

- There is no history of acoustic trauma, hypertension, diabetes, drug intake for the past one week.
- No history of upper respiratory infection.

On examination patient is anxious about the problem of sudden hearing loss.

- Pulse 82/minute
- Blood pressure 130/86 mm of hg
- Systemic examination – NAD

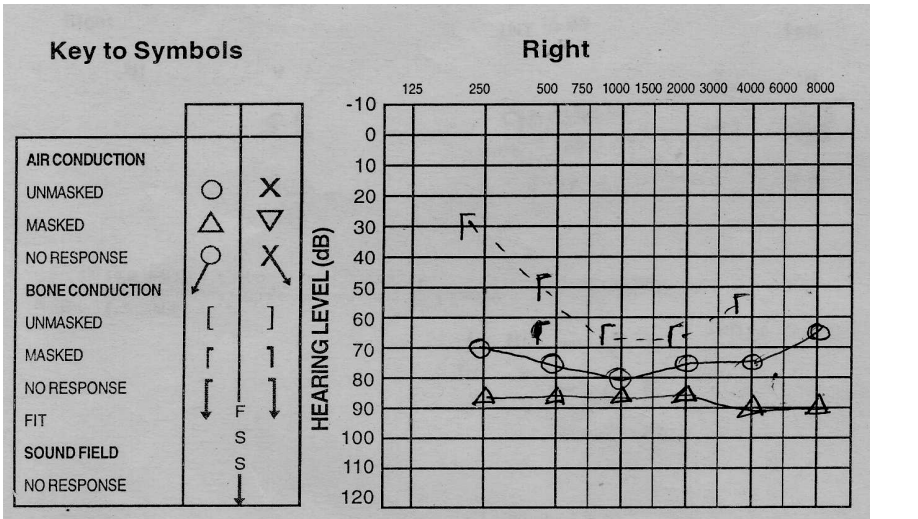
ENT examination reveals both the tympanic membranes are normal with all the normal land marks.

[1]Reader, Dept. of Otorhinolaryngology, All India Institute of Speech and Hearing, Manasagangothri, Mysore-570006, [2]Reader, Dept. of ENT, All India Institute of Speech and Hearing, Manasagangothri, Mysore-570006, email: drrajg@yahoo.com.

- Pre aural and post aural region normal.
- Mastoid region normal.
- Facial nerve intact and normal.
- A tuning fork test reveals right sided sensory neural hearing loss.
- Caloric test were normal.

Hematological investigations - HB %, Blood total count, Differential count, RBS, Serum cretin, Blood urea, were within normal limits.

- x-ray of the both mastoids were well pneumatised and appears normal Audiological evaluations
- PTA reveals moderate to severe sensory neural hearing loss right side with maximum affections in the mid frequencies
- SIS less than 60%
- Impedance was normal with a type tympanograph with absent of acoustic reflex(table 1)
- ABR normal way morphology with normal interpeak latency.
- Recruitment



SPEECH AUDIOMETRY

	PTA (dB HL)	SRT (dB HL)	SI (%)
RIGHT EAR	85dB*	85dB*	95%*60%
LEFT EAR	10dB.	10dB	95%.

SPECIAL TESTS Weber: Centralised at 250Hz & lateralised

Table 1

In office setting patient was treated on tablet – Methyl Prednisolone 1 mg/kg body weight in 3 divided doses for a period of 2 weeks.

- Peripheral vasodilators like cinnarizine 25 mg was also given for 4 weeks.
- A non steroidal antiinflammtory was also given.
- Vitamine B complex and alongwith anti oxidents were prescribed.
- Patient was advised on low salt diet.

Neurological opinion reveals no neurological deficits. 2 weeks later patient felt 70% improvement in the symptoms of hearing loss and tinnitus. Methyl Prednisolone was given on tapered dose for another 2 weeks. All the other drugs were continued for 2 more weeks.

After one month patient felt completely normal in his symptoms.

Audiological evaluations were done again after one month and was revealed normal hearing. (Table 3)

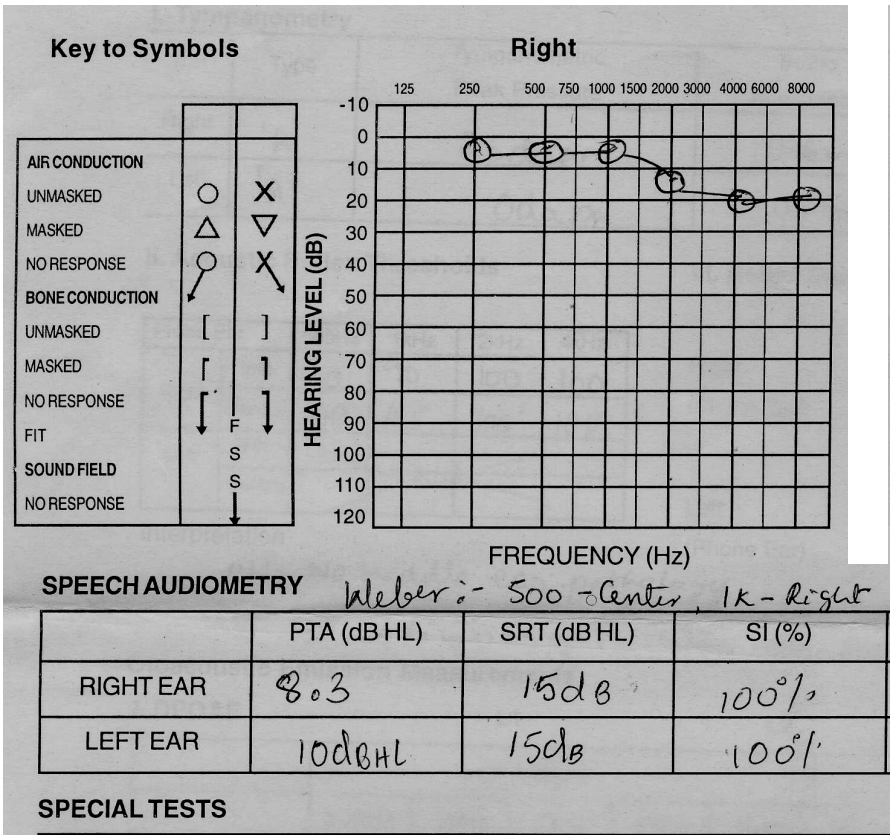


Table 3

Discussion

Pathophysiology

The postulated pathophysiology for idiopathic sudden sensory hearing loss (ISSHL) has 4 theoretical pathways. These are labyrinthine viral infection, labyrinthine vascular compromise, intracochlar membrane ruptures, and immunemediated inner ear disease. A disease process involving any of these theoretical possibilities could have sudden hearing loss as a symptom. Each theory may explain a fraction an episodes of sudden sensory hearing loss, but none of the existing theories individually could account for all episodes.

Viral infection

The evidence to implicate viral infection as one of sudden idiopathic sensory hearing loss is circumstantial. Studies of patients with ISSHL show a moderate prevalence of recent viral – type illness. Sometimes, evidence of recent viral seroconversion inner ear histopathology consistent with viral infection is present.

Vascular compromise

The cochlea is an end organ with respect to its blood supply, with no collateral vasculature.

Cochlear function is exquisitely sensitive to changes in blood supply. Vascular compromise of the cochlea due to thrombosis, embolus, reduced blood flow, or vasospasm seems to be a likely etiology for ISSHL. The time course correlates well with a vascular event, a sudden or abrupt loss. A reduction in oxygenation of the cochlea is the likely consequence of alterations in cochlear blood flow. Alterations in perilymph oxygen tension have measured in response to changes in systemic blood pressure or intravascular carbon dioxide partial pressure (pCO2).

Conclusions

Young patients with no systemic illness and unilateral sensory neural hearing loss will have better prognosis. This case is reported because of the treatment protocol was taken up at office base

setup without any admission of the patient and without any administration of the injections.

We know that parentral use of steroids is the established protocol for the sudden sensory neural hearing loss. In this study we are reporting a case of oral steroid therapy is also equally effective in certain cases if the hearing loss is unilateral, and if the patient is without any systemic illness and younger age group patients.

References

Wilson, W.R., Byl, F.M., & Laird, N.(1980). The efficacy of steroids in the treatment of idiopathic sudden hearing loss. A double blind clinical study. *Arch Otolaryngol,*12, 772-776.

Moskowitz, D., Lee, K.J., & Smith, H.W. (1984). Steroid use in idiopathic sudden sensiorineural hearing loss. *Laryngoscope*, 94(5 Pt 1), 664-666.

Kitajiri, S., Tabuchi, K., & Hiraumi, H. (2002). Is corticosteroid therapy effective for sudden – onset sensorineural hearing loss at lower frequencies. *Arch Otolaryngol Head NeckSurg* , 128, 365-367.

Chen, C.Y., Halpin, C., & Rauch, S.D.(2003). Oral steroid treatment of sudden onset sensorineural hearing loss: a ten year retrospective analysis. *Otol Neurotol*, 24, 728-733.

Van Dishoeck, H., & Bierman, T. (1957). Sudden perceptive deafness and viral infection (report of the first one hundred patients).*Ann Otol Rhinol Laryngol* , 66, 963-980.

Rasmussen, H. (1949).Sudden deafness. *Acta Otolaryngol*, 37, 65-70

Schuknecht, H.F., & Donovan, E.D (1986).The pathology of sudden deafness. *Arch Otolaryngol*, 243, 1-15

Yoon, T. H., Papirella, M.M., Schachern, P.A., & Alleva, M. (1990). Histopathology of sudden hearing loss. *Laryngoscope,* 100, 707-715.

Pitkaranta, A., Vasama, J.P., & Julkunen, I. (1999). Sudden deafness and viral infections. *Otorhinolaryngol Nova,* 9, 190-197.

Tucei, D.L., Farmar, J.C., Kitch, R.D., & Witsell, D.L. (2002). Treatment of sudden sensorineural hearing loss with systemic steroids and Valacyclovir. *Otol Neurotol,* 23, 301-308.

Scheinman, R.I., Cogswell, P.C., Lofquist, A.K., & Baldwin, A.S. (1995). Role of transcriptional activation of I kappa B alpha in mediation of immunosuppression by glucocorticoids, *Science,* 270, 283-286.

Scheinman, R.I., Gualberto, A., Jewell, C.M., Cidlowski, J.A., & Baldwin, A.s.(1995). Characterization of Mechanisms involved in transrepression of NF – kappa B by activated glucocorticoid receptors. *Mol Cell Biol*, 15, 943-953.