

Role of Steroids and Anti - Viral Therapy in Sudden Sensorineural Hearing Loss

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ABSTRACT

OBJECTIVE: The objective of this study was to know the effects of steroids and antivirals in the management of idiopathic sudden sensorineural hearing loss.

METHODS: In this prospective study, 42 patients presenting with idiopathic sudden hearing loss of 30 db or more were enrolled in study group between 2003 and 2008. Hydrocortisone and dextran given by IV route, followed by anti-viral agent orally. Before and after treatment pure tone average was analyzed.

RESULTS: Results showed overall improvement in hearing observed in 34 patients (80.9%) by giving combine therapy. It also showed there is affiliation between the patients presentation in hospital for treatment and hearing improvement, the patient who got treatment earlier before 72 hours was more beneficial.

CONCLUSION: Early diagnosis and treatment with volume expanders, steroids and antivirals agent improves the chances of recovery.

KEYWORDS: Sudden sensorineural hearing loss, Steroids/anti-viral therapy loss.

INTRODUCTION

"Idiopathic sudden sensory neural hearing loss (SSNHL) has been defined as 30 dB or more sensorineural hearing loss over at least three contiguous audiometric frequencies occurring within three days or less." 15,000 new cases are documented per year world wide noted for on average 1% of all cases of sensorineural deafness [1]. Hearing loss is usually one sided and more often is associated with tinnitus (70%), vertigo or milder sensation of spatial disorientation is noted in 50% of cases. Deafness may be of low degree in a restricted frequency range or it may be complete [2].

The etiology of SSNHL is unknown but associated with viral infection, vascular compromise, distortion of cochlear membrane; immunological illness and otological tumors of the ears [2]. Approximately one-third of cases have upper respiratory prodrome preceding SSNHL indicating the role of viruses in the **causes** of this disease [3]. The changes in microcirculation of cochlea have long been thought to be a cause of SSNHL[3]. The blood supply to cochlea is supplied by labyrinthine artery, which has no collateral connection. Vascular diseases may cause SSNHL due to cochlear trauma and dysfunction due to anoxia or hypoxia [4].

Management of SSNHL should be started earlier, should be aggressive and should cover those diseases that are most likely to improve [1]. Management is not fruitful once 30 days have elapsed because active problem may have cured and injury may be per-

manent. High dose systemic steroid causation is now a day important for SSNHL as a result of its high anti-inflammatory effect [5]. They also decreases toxic immune response, raise the micro vascular blood flow in the cochlea and reduces the onset of endolymphatic hydrops. Low molecular weight dextrans causes increase of plasma volume and raise the cardiac output, increase in vascular perfusion and microcirculation, decrease the blood viscosity; platelet adhesiveness and rouleau formation [2]. Antiviral agents like acyclovir or valacyclovir must be suggested for SSNHL considering the viral infection being the probable etiology. In this study we evaluated our research with combined regime of low molecular weight dextrans, steroid therapy, vasodilators and antiviral.

Oral Acyclovir 600 mcg t.i.d was given for 10 days to those cases who presented within 10 days.

Neurovitamins were administered.

Aspirin 75 mg b.i.d daily is given to prevent thrombus formation.

In diabetics, dextrans were administered along with normal saline in place of 5% dextrose and oral steroids not given.

MATERIALS AND METHODS

The present prospective study was carried out in the department of ENT, Liaquat University Hospital Hyderabad & ENT department Civil Hospital Karachi, on 42 patients presenting with idiopathic SSNHL between 2003 and 2008. A careful history regarding trauma and sudden intense noise exposure was noted. Most of the patients complain of sudden loss of hearing on

exposure to cold and drinking ice-cold water. More than 57% complain of blocked sensation in the ear. General physical examination is done. Otoscopy, fistula testing, neurotological examination including cranial nerves, cerebellar function is performed. Hearing loss was measured with tuning fork test and pure tone audiogram (PTA). For all 42 patients standard treatment protocol was observed.

1. Intravenous dextrans in 5% dextrose 500 ml was administered slowly over 4–6 h. This is followed 2 hours later by another 500 ml if the cases had subjective progress. Majority of the cases have improvement of tinnitus after initial dose of dextrans. Patient is kept under continuous monitoring while giving dextrans as they may induce cardiac problem. Audiometry is repeated on the next day. If the patient has improvement another two doses of 500 ml of 5% dextrose with dextrans are administered over 6–8 h. From third day onwards patient is kept on oral xanthinol nicotinate 150 mg twice daily for 1 month.
2. Intravenous hydrocortisone 100 mg was given twice daily for 2 days. This is followed by oral steroids (either prednisolone 1 mg/kg or methylprednisolone 0.8 mg/kg) for 5 days. Dose is tapered over the next 10 days.

Severity of SSNHL [7] is classified as
 "Mild: (41–55 dB)
 Moderate: (56–70 dB)
 Severe: (71–90 dB) and
 Profound 90 dB HL"

The prognosis of SSNHL is difficult to define as most cases did not have audiograms before the SSNHL episode, the hearing in normal ear as measured at the time of diagnosis was used as standard. We adopted following definition for improvement considering normal hearing contra-lateral ear as indicator of status of affected ear prior to hearing loss.

1. Total (Type 1) improvement: The hearing improved 10 dB of contra-lateral ear hearing pure tone average.
2. Incomplete (Type 2) improvement: The hearing improved within 50% or more of contra-lateral ear hearing loss pure tone average.
3. No (Type 3) Response: Less than 50% recovery of hearing.

RESULTS

A total of 42 patients with unilateral sudden onset nerve deafness were enrolled in the study. We divided the patients in four types such as Moderate hearing loss, moderate to severe hearing loss, severe hearing loss and profound hearing loss.

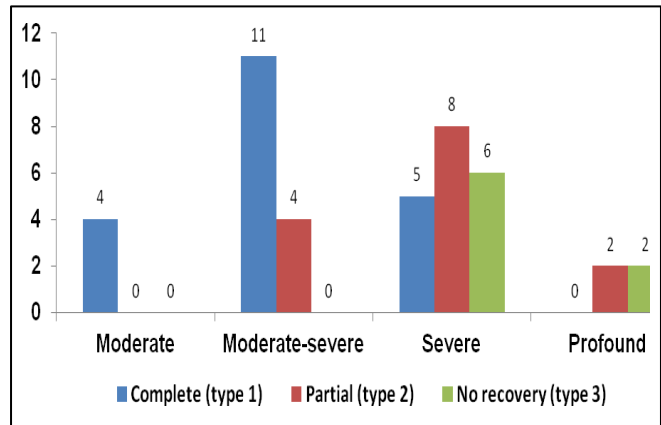
The average age was 44.3 years (range 25–65 years). There were 31 males and 11 females. Majority

of the patients having deafness associated with tinnitus while 32 patients also complained vertigo (76.1%). As per classification for extent of improvement, total recovery (Type 1) was seen in 20 (47.6%), incomplete recovery (Type 2) was seen in 14 (33.3%) and no recovery (Type 3) was seen in 8 (19.02%) (Graph I).

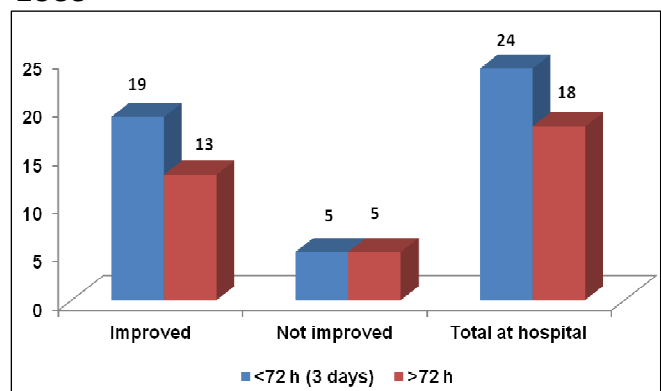
Types of deafness pattern in pure tone audiogram were seen as ascending in 10 (23.8%), descending in 6 (14.2%), flat in 23 (54.4%) and total in 5 (11.9%).

In this study, total recovery and partial groups are gathered in recovery group. 76.1% of the treated patients got betterment. Tinnitus was improved in majority of type 1 and type 2 patients by giving intravenous dextrans. Of the 32 patients with vertigo, 18 got relief (56.25%). Four out of eight patients with type 3 recovery had diabetes. They presented with severe to profound deafness and they did not improve with intravenous dextrans and antivirals. Steroids were avoided in these patients.

GRAPH I: COMPARISON OF EXTENT OF IMPROVEMENT WITH THE SEVERITY OF HEARING LOSS AT THE TIME OF PRESENTATION



GRAPH II: COMPARISON OF EXTENT OF IMPROVEMENT AND THE TIME OF PRESENTATION AFTER SUDDEN SENSORINEURAL HEARING LOSS



Fishers exact test: Two tailed P value = 0.024 (statistically significant)

Cases have been gathered into two groups depending on the time gap between onset of sudden deafness and their visit at the hospital (Graph II). Twenty four patients (57.1%) attended hospital < 72 h had type 1 recovery whereas only eighteen patients (42%) attended hospital > 72 h had type 1 recovery. With mixed treatment the overall betterment in pure tone threshold was observed in 34 patients (80.9%) which were more than prompt recovery. This study showed that the patients who attended the hospital earlier had better improvement in hearing.

DISCUSSION

Evaluation and treatment of sudden sensory neural hearing loss should be seen as a medical emergency, if not an urgency [1]. A large number of patients report that the deafness was observed immediately on awakening suggesting that deafness occurred during sleep [8]. Some cases say that they heard a pop sound in the ear following which they had become deaf. Delicacy of the structures involved makes elucidation of and interference with the pathophysiology difficult [6]. The possible mechanism for vascular cause of SSNHL includes hemorrhage, thrombosis, embolism, vasospasm and hypercoagulability [4].

In this study, history suggested that most of the cases developed deafness following exposure to cool breeze, traveling in air conditioned bus. We suspects vasospasm as the most common cause in these patients. History, simple tuning fork tests and pure tone audiogram help make a diagnosis.

The duration of time from the onset of symptoms until visit at the hospital may be one of the most valuable factors in making a case's prognosis. Most cases do not get advice immediately at the initiation of symptoms and the typical presentation is generally delayed 48 to 96 h [8]. In this study out of the 18 cases who presented within 3 days, 15 (77.8%) had type 1 recovery, 2 (11.1%) had type 2 recovery and 1 (5.5%) had type 3 recovery. 4 (25%) of the cases presenting after 3 days had type 1 recovery, 6 (37.5%) had type 2 recovery and 6 (37.5%) had type 3 recovery.

Conservative treatment should be started immediately after the diagnosis. Recently a retrospective study conducted by Zadeh and Storper et al. [10] demonstrated that antiviral therapy and increased length of steroid treatment has given 73% recovery. combine therapy of vasodilators, steroids and antivirals has given betterment in 79.4% in our case series. Mattox

et al. [11] found that shape of the initial audiogram was related to recovery and patients with low frequency or mid frequency (u-shaped) audiogram contour showed a better recovery. The results of present study showed that more severe hearing loss, delayed presentation and associated diabetes were poor prognostic factors.

CONCLUSION

SSNHL is a medical emergency. The prompt detection and treatment with vasodilators, steroids and antivirals will improve the probability of good recovery.

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