



ROLE OF ORAL STEROIDS IN SUDDEN SENSORINEURAL HEARING LOSS

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ABSTRACT

OBJECTIVE

To determine hearing recovery in patients with idiopathic sudden sensorineural hearing loss treated with oral steroids.

STUDY DESIGN AND SETTING

A prospective study was done on 80 sudden hearing loss patients, treated with 60-mg prednisone tapered over 15 days at tertiary care hospital.

RESULTS:

35% of the patients recovered a clinically significant amount of hearing. Better Recovery was associated with immediate treatment and better hearing at the onset of treatment.

CONCLUSION:

Immediate treatment of patients with idiopathic sudden hearing loss with a 14-day course of 60 mg prednisone (with taper) is recommended.

Keywords:

INTRODUCTION:

Sudden sensorineural hearing loss (SSNHL) has wide age distribution, but occurs most commonly in people aged 50-60 years, usually affects one ear only, and can be associated with tinnitus and vertigo. Idiopathic sudden sensorineural hearing loss affects between 5 to 20 persons per 100,000 annually¹ and was first described in 1944.² SSNHL can be associated with rapidly progressive hearing loss, developing over weeks and months after an initial acute SSNHL event. The severity of hearing loss is divided roughly equally into mild, moderate, and severe/profound. The configuration of the hearing loss varies and can affect high, low, or all frequencies. Tinnitus occurs in about 80% of patients, and vertigo, indicating an associated peripheral vestibular dysfunction, in about 30%. Up to 80% of patients report a feeling of ear fullness. Various infections, and vascular and immune causes, have been proposed as causes of SSNHL. Mumps can be a cause, accounting for 7% of adult cases. Rubella, varicella zoster virus, cytomegalovirus, and Epstein-Barr virus have all been implicated, though evidence is incomplete. Proposed vascular causes include a variety of conditions affecting the cochlea (the 'hearing' part of the inner ear). Abnormal blood cholesterol levels and low blood pressure have also been suggested. Some evidence suggests SSNHL is linked to stroke, with SSNHL preceding stroke in 8% of 364 patients in one prospective series study. Abrupt, severe,

and irreversible SSNHL has also been described in patients with migraine. Generally, patients with sudden loss present to primary care or emergency room physicians. Ninety-eight percent of these physicians prescribe steroids,³ in addition to the amount of steroid associated with recovery, the length of time the medication should be given has not been well established. It appears that patients may experience some hearing recovery after drug treatment has ended, in some cases up to 1 month after treatment.⁴ Most investigators agree that idiopathic sudden hearing loss is a multifaceted disease entity, with a number of suggested causes.^{5,6} This prospective study was done (n = 80) in GMC Srinagar from February 2016 to February 2017, examined sudden hearing loss patients treated with 60-mg prednisone taper.

METHODS

A total of 80 adult patients of sudden sensorineural hearing loss were studied from February 2015 to February 2017 in govt medical college Srinagar among which 37(46.25%) were male and 43(53.75%) were females. The left ear was the affected ear in 41 (51.25%) cases. Patients were grouped according to the time of presentation. 3 groups were made. Patients who presented in 1 to 3 days (group A), patients who presented from day 4 to day 7 (group B), patients who presented from day 8 to day 10 (group C). Group A comprised of 25(31.25%) of patients, group B comprised of 25 patients (31.25%) and group C

consisted of 30(37.5%) patients. All patients received a course of 60-mg prednisone tapered over 14 days (see Table 1). Pre and post treatment PTA was done in all patients to detect sensorineural hearing loss. Post treatment PTA was done in all patients on completion of treatment at 2nd week. All patients in which the duration was less than 10 days were put on oral steroids.

Inclusion Criteria:

- sensorineural Hearing loss of at least 30 dB across 3 contiguous frequencies within 72 hours.
- Presented to our department within 10 days of hearing loss onset.

Table 1; oral steroid dosage schedule

Dosage schedule	Prednisone
Day 1-9	60mg
Day 10	40mg
Day 11	30mg
Day 12	20mg
Day 13	10mg
Day 14	5mg

Results:

There were no adverse events as a result of steroid treatment in the 80 patients included in the study. Treatment with oral steroids significantly improved hearing, as assessed by PTA (table 2). Better pretreatment hearing was associated with better post treatment hearing.

Table 2 ; pre and post treatment hearing loss in various groups

Groups	Pre treatment hearing loss (avg)	Post treatment hearing loss (avg)
Group A	65 dB	25 dB
Group B	65 dB	33 dB
Group C	70 dB	55 dB

Out of 80 patients 28 patients (35%) had clinically successful treatment that is recovery of at least 50%.

In group A among 25 patients , 17 patients(68%) had clinically successful treatment ,6 patients(24%) among 25 patients in group B , and 5 patients(16.6%) among 30 patients in group C had clinically successful treatment.

Table3 ; percentage of patients treated successfully in various groups

Group	Total no. of patients	Percentage	No. of patients with clinically successful treatment	Percentage
Group A	25	31.25%	17	68%
Group B	25	31.25%	6	24%
Group C	30	37.5%	5	16.6%
Total	80	100%	28	35%

According to the results of our study it was seen that maximum benefit achieved was time dependent , and earlier the patient presented to otolaryngologist more was the benefit.68% of the patients who came within 1-3 days achieved clinically successful treatment while it was decreased in patients to 24% who presented between 4 – 7 days while minimum benefit (16.6%) was seen in patients who came after 7 days of hearing loss.

DISCUSSION:

Definitions of sudden hearing loss have been based on severity, time course, audiometric criteria, and frequency spectrum of the loss. Abrupt as well as rapidly progressive losses have been included under a single definition of sudden hearing loss. A commonly used criterion to qualify for this diagnosis is a sensorineural hearing loss of greater than 30 dB over 3 contiguous pure-tone frequencies occurring within 3 days' period.

The postulated pathophysiology for idiopathic sudden sensory hearing loss (ISSHL) has 4 theoretical pathways, as follows:

- Labyrinthine viral infection
- Labyrinthine vascular compromise

- Intracochlear membrane ruptures
- Immune-mediated inner ear disease.

In one study of ISSHL, subclinical mumps infections were documented in 9 of 130 patients by positive immunoglobulin M (IgM) mumps antibodies.^[7]

Historical prospective cohort study by Chang et al indicated that hypercholesterolemia is associated with an increased risk for idiopathic sudden sensorineural hearing loss (ISSNHL). Comparing nearly 74,000 patients with hypercholesterolemia with the same number of age-matched controls, the investigators found the incidence of ISSNHL to be 1.62 times greater in the hypercholesterolemia group.^[8] The theory of intracochlear membrane rupture was favored by Simmons and Goodhill, and histologic evidence has been documented by Gussen.^[9,10,11]

A recent prospective study on 51 patients with ISSNHL supported the existence of multiple immune-mediated disorders in these patients.^[12] The link between hearing loss and anemia seemed to be strongest in persons aged 44 years or younger.^[13]

This study was performed in department of Otorhinolaryngology and HNS in GMC Srinagar. 80 patients were studied. All patients received a course of 60-mg prednisone tapered over 14 days. Pre and post treatment PTA was done in all patients to detect sensorineural hearing loss. All patients in which the duration was less than 10 days were put on oral steroids. It was seen out of 80 patients 28 patients (35%) had clinically successful treatment, that is recovery of at least 50%. According to our study it was seen that maximum benefit achieved was time dependent, and earlier the patient presented to physician more was the benefit. 68% of the patients who came within 1-3 days achieved clinically successful treatment while it was decreased in patients to 24% who presented between 4 - 7 days while minimum benefit (16.6%) was seen in patients who came after 7 days of hearing loss.

CONCLUSION:

All patients presenting with sudden sensorineural hearing loss should be treated with oral steroids. In our study 35 % of patient showed clinically successful improvement and it was seen that earlier the patient presented to the otolaryngologist more is the benefit.

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