MANAGEMENT OF IDIOPATHIC SUDDEN SENSORINEURAL HEARING LOSS: OUR EXPERIENCE

Surya Prakash D. R[1], E. Konappa Reddy[2], Altaf Hussain[3], Raghavendra M[4]

[1]Assistant Professor, Department of ENT, M. S. Ramaiah Medical College, Bangalore.
[2]Professor, Department of ENT, M. S. Ramaiah Medical College, Bangalore.
[3]Post Graduate, Department of ENT, M. S. Ramaiah Medical College, Bangalore.
[4]Post Graduate, Department of ENT, M. S. Ramaiah Medical College, Bangalore.

ABSTRACT

Sudden Sensorineural Hearing Loss (SSHL) is dreaded condition affecting many individuals around the world due to its sudden appearance and inconspicuous nature of disease. More than 50% recover spontaneously, but timely identification of cause and treatment can help the patient immensely.

METHODS

In our study, we prospectively analyzed twenty patients presenting with idiopathic sudden hearing loss of 30 db or more between 2010 and 2015.

RESULTS

Two out of 20 patients (60%) showed complete improvement and 10 patients out of 13 (77%) who presented with 7 days showed complete recovery. Hence, time of presentation and drugs used directly affect the outcome of the patient.

CONCLUSION

It can be safely concluded that early diagnosis and management is key in treatment of SSHL. Intratympanic dexamethasone with intravenous dexamethasone or oral deflazacort is used in all patients with supportive measures has helped most of our patients. Oral acyclovir was used in only one patient.

KEYWORDS

Sudden Sensorineural Hearing Loss, Methylcobalamin Betahistine, Ginkgo Biloba, Vinpocetine, Xanthinol, Intravenous Hetastarch, Methylprednisolone, Intratympanic Dexamethasone.

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INTRODUCTION

Sudden Sensorineural Hearing Loss (SSHL) is a loss that is greater than 30 dB in three contiguous frequencies and that occurs in less than 3 days.[1] most sudden hearing loss occur within minutes to several hours. The majority of cases elude precise etiologic determination and are termed Idiopathic Sudden Sensorineural Hearing Loss (ISHL). ISHL remains a diagnosis of exclusion and an appropriately focused diagnostic evaluation; 15,000 new cases are reported annually worldwide accounting for approximately 1% of all cases of sensorineural hearing loss.[2] Hearing loss is usually unilateral and frequently is accompanied by tinnitus (70%), vertigo or milder sensation of spatial disorientation.

Many theories have been put forward to explain the cause of SSHL, but none have been conclusively proven in all of the patients. Many viruses have been identified to cause SSHL like CMV, rubella, rubeola, varicella zoster, HSV I, HSV II, parainfluenza A, B, and C, Lassa fever (Arenavirus), EB virus, HIV with mumps virus accounting for about 7% of adult cases.[2] Thus, many viruses have been postulated as possible causes of sudden sensorineural hearing loss, but serological, epidemiological and histopathological data are not conclusive.[3]

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Corresponding Author:
Dr. Surya Prakash D. R,
Assistant Professor,
Department of ENT,
M. S. Ramaiah Medical College,
Bangalore-560054.
E-mail: drdrsuryaprakash@gmail.com
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Studies have investigated several possible, mechanisms including atherosclerosis, hypotension, thrombophilia vasospasm, hyperviscosity and paradoxical embolism. However, there is no hard histological evidence for vascular occlusion being a common cause of this disorder.[4,5] Sudden sensorineural hearing loss has also been described as a presenting feature of fungal meningitis, otosyphilis, HIV, and rarely Creutzfeldt-Jakob disease.[6] Systemic immune-mediated diseases have shown evidence of T-cell antibody and recognition of inner-ear antigens.[7] The most common neoplastic disease associated with sudden sensorineural hearing loss is vestibular schwannoma, which usually presents with unilateral tinnitus and progressive sensorineural hearing loss, although it can present with sudden loss in a few cases.[8] Nonetheless, sudden sensorineural hearing loss is rarely associated with pregnancy.[9]

Management of SSHL include a history and review of symptoms, otologic and neuro-otologic examination, audiological testing and laboratory studies. A decision regarding the method of treatment should be made promptly when the patient is first examined and after the immediately available laboratory work is reviewed, that is at most within 1 day.

Many studies have stressed on importance of using MRI with gadolinium enhancement as TIA and strokes are missed during initial assessment.[10] MRI with gadolinium is also able to demonstrate presumed viral inflammation of the cochlear or vestibular membranous labyrinth in patients with ISHL on T-1 weighted images.[11] as well as seventh cranial nerve inflammation in Bell's palsy.[12]

A maximum of 32% to 65% of cases of SSNHL may recover spontaneously.[13,14] Recovery is dependent on a number of factors including patient age, presence of vertigo at onset, degree of hearing loss, audiometric configuration and

time between onset of hearing loss and treatment.[15,16,17] Treatment options include systemic and topical steroids, antiviral agents, diuretics, hyperbaric oxygen treatment, middle ear surgery for fistula repair, etc. and sometimes observation alone. The comparative efficacy of these treatments, however, is not known considering that the definitive etiology is also commonly not known. Long term followup is required to know the pathogenesis of the cause and treat the relapse at earliest, but it seldom possible.

In 85% to 90% of cases, despite thorough evaluation the underlying cause is unknown or uncertain at the time of presentation and treatment decisions are generally made without knowledge of the etiology.[15,16,17] Patients present with fullness or ear block sensation that the clinician fails to evaluate further. On the contrary, a frightened patient with sudden SNHL might be inclined for a higher investigation like MRI in the initial setting. Thus clinical suspicion and through examination has to be done in a systematic manner to all patients with sudden sensorineural hearing loss.

As the etiology is usually unknown, treatments have been empiric. The most commonly used treatment has been corticosteroids (Systemic and/or intratympanic). A large array of other treatments such as antivirals, antibiotics, diuretics, vasodilators, osmotic agents, plasma expanders, anticoagulants, mineral supplements and hyperbaric oxygen or carbon dioxide–rich gases among others has been used.[18] but the efficacy of the above mentioned drugs is inconclusive at present and physician should be meticulous in his approach.

MATERIAL AND METHODS

Patients were included in the study who came to tertiary referral center with complaints of sudden hearing loss. They were evaluated with otorhinolaryngology examination, audiometry initially and occasionally MRI scan. Audiologist were blinded in the study. A PTA of 500, 1000, 2000, 4000 and 8000 Hz was used to categorize the losses as mild (26–40 dB), moderate (41–60 dB), severe (61–80 dB), profound or total (80 dB). Audiometry was repeated at 0 and 7 days of starting the treatment. The therapeutic effect was evaluated basing on the change in hearing threshold from the first audiogram (Tested before treatment) to 7 days post treatment.

It was considered as total recovery that the PTA, calculated based on thresholds of 500, 1000, 2000 and 4000 Hz or the three frequencies considered for evaluation before treatment, recovered to normal hearing threshold (<25 dB). It was considered as excellent recovery that the PTA improved 30 dB or more, partial recovery the PTA value improved between 15 and 30 dB and lack of recovery below 15 dB. All the patients were idiopathic sudden sensorineural type of hearing loss. All the patients could not be followed up after 7 days and none came back with recurrence of symptoms.

Inclusion Criteria

1. Sudden onset of hearing loss in one or both ears.
2. Audiometry showing >30 db loss in at least 3 frequencies or abrupt loss of hearing over few hours.
3. All the investigations done were within normal limits (Idiopathic in nature).

Exclusion Criteria

1. History of trauma.
2. History of failed treatment before.
3. Use of ototoxic drugs.
4. History of ear discharge or otosclerosis.
5. History of pre-existing illness – local or systemic.
6. History of documented pre-existing profound hearing loss.

Standard Operating Protocol Used

Patient was diagnosed to have sudden sensorineural type of hearing loss, option was given about admission and intravenous methylprednisolone (1mg/kg/day) for 10 days with intratympanic injection of dexamethasone (1-2mg/day) for three days. If patient refused admission, oral deflazacort (30mg/day) was given for 10 days with intratympanic injection of dexamethasone. Supportive treatment included methylcobalamin (1500mcg/day), betahistine (24mg TID), Ginkgo biloba, vinpocetine, xanthinol, intravenous hetastarch (1mg/kg/day). No patient was suspected as viral etiology except one where acyclovir was given.

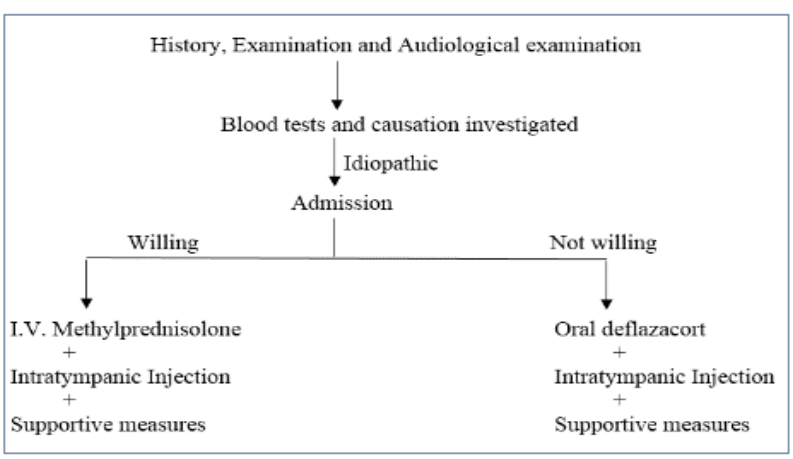

Figure 1: Shows the Standard Operating Protocol followed by us

RESULTS

Twenty patients were retrospectively analyzed after inclusion criteria; 15 were males and 5 were females. Out of 20 patients, 12 patients (60%) had complete recovery from hearing loss when compared to pre-treatment audiometry; 4 patients (20%) had partial recovery and 4 patients (20%) had no recovery; 3 out of 4 patients (75%) who showed no improvement presented late with at least 7 days past the episode of sudden hearing loss. Among the 13 patients who presented early, 1 had no recovery, 2 had partial recovery and 10 had complete recovery (77%); 7 patients presented at least 7 days after the first episode of sudden hearing loss, 3 had no improvement, 2 had partial and 2 had complete recovery. All patients (12) who showed complete recovery had received intratympanic dexamethasone with intravenous methylprednisolone, Ginkgo biloba and methylcobalamin. Intravenous hetastarch was used in 5 patients and 4 of them showed excellent improvement and 1 had partial improvement. Acyclovir was used only in one patient and its

on-usage did not adversely affect the pathophysiology of disease.

Sl. No.	TIME TO PRESENTATION (IN DAYS)
1	7
2	1
3	3
4	3
5	30
6	3
7	3
8	15
9	15
10	3
11	2
12	3
13	90
14	15
15	3
16	7
17	3
18	1
19	5
20	5

Table 1: Shows the Time of Presentation of Patient to the OPD After Sudden Onset Hearing Loss

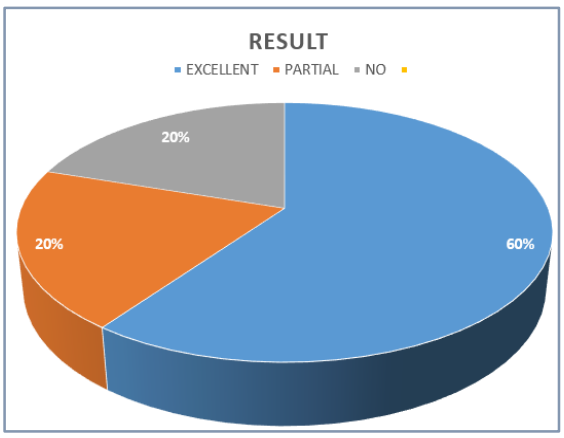

Fig. 2: Shows the Result Distribution in Excellent Recovery, Partial Recovery and No Recovery

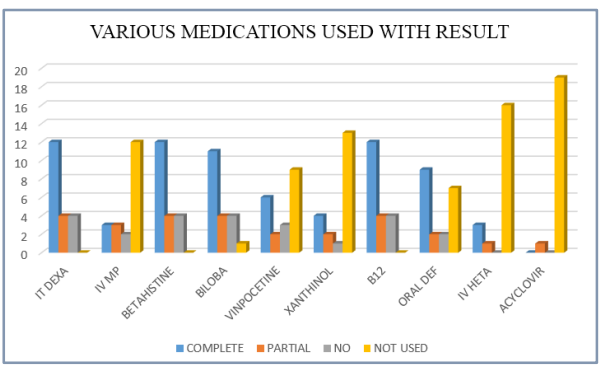

Figure 3: Shows Usage of all the Medications with Improvements Seen and Number of Patients in Whom the Drug was Not Used

Sl. No.	AGE	SEX	CO-MORBIDITIES	INTRA TYMPANIC DEXA	I.V. METHYL PRED	BETA HISTINE	GINKGO BILOBA	VINPO CETINE	XANTHINOL	METHYLCOBALAMIN	ORAL DEFLAZACORT	I.V. HETA STARCH	ACYCLOVIR	RESULT
1	60	M	NIL	YES	NO	YES	YES	YES	NO	YES	YES	NO	NO	NO
2	56	M	IHD	YES	NO	YES	YES	NO	YES	YES	YES	NO	NO	EXCELLENT
3	40	M	NIL	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO	PARTIAL
4	20	M	DEXTROCARDIA	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO
5	33	F	NIL	YES	YES	YES	YES	NO	YES	YES	YES	NO	NO	PARTIAL
6	62	F	IHD, DM	YES	NO	YES	YES	YES	NO	YES	NO	NO	YES	PARTIAL
7	22	M	NIL	YES	YES	YES	YES	YES	NO	YES	YES	YES	NO	EXCELLENT
8	22	M	HYPERHOMOCYSTEMENIA	YES	YES	YES	YES	YES	NO	YES	YES	YES	NO	EXCELLENT
9	32	F	NIL	YES	YES	YES	YES	YES	NO	YES	YES	YES	NO	PARTIAL
10	65	M	IHD	YES	NO	YES	NO	NO	NO	YES	NO	NO	NO	EXCELLENT
11	45	F	NIL	YES	YES	YES	YES	NO	YES	YES	NO	YES	NO	EXCELLENT
12	56	M	DM	YES	NO	YES	YES	NO	YES	YES	YES	NO	NO	EXCELLENT
13	42	M	NIL	YES	NO	YES	YES	YES	NO	YES	NO	NO	NO	NO
14	19	M	MULTIPLE SCLEROSIS	YES	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO
15	54	M	NIL	YES	NO	YES	YES	YES	NO	YES	YES	NO	NO	EXCELLENT
16	73	M	NIL	YES	NO	YES	YES	YES	NO	YES	YES	NO	NO	EXCELLENT
17	77	M	NIL	YES	NO	YES	YES	YES	NO	YES	YES	NO	NO	EXCELLENT
18	40	F	NIL	YES	NO	YES	YES	NO	NO	YES	NO	NO	NO	EXCELLENT
19	34	M	NIL	YES	NO	YES	YES	YES	NO	YES	YES	NO	NO	EXCELLENT
20	37	M	NIL	YES	NO	YES	YES	NO	YES	YES	YES	NO	NO	EXCELLENT

Table 2: Shows the Number of Patients with their Comorbidities with Different Medications Used and Type of Recovery Seen

CONCLUSION

The natural course of ISSHL is characterized by spontaneous recovery among approximately 50% of patients. As the etiology and pathophysiology of hearing loss are unknown, possible causes include infections (Especially viruses), autoimmune disease, circulatory problems and neurological disease including multiple sclerosis. Hearing loss can improve even if the treatment is started in less than a month since onset.[19,20,21] and it is found that history of >3 months has very poor recovery. As we have noted in our present study, 77% patients who presented to OPD within 7 days showed complete recovery. All the patients did not receive all drugs, but it was found that more the supportive measures given better was the result. Also earlier the presentation, better was the outcomes.

We conclude that supplementary medications, intratympanic dexamethasone with intravenous prednisolone or oral deflazacort are necessary for better improvements for patients with idiopathic sensorineural hearing loss. Patients have to be counselled about the medications available, protocols followed and results before treatment is started.

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