

# Idiopathic sudden sensorineural hearing loss – A 12-month review



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## ABSTRACT

**Background:** Idiopathic sudden sensorineural hearing loss (ISSNHL) is a condition which is difficult to define and treat. Sensorineural hearing loss being a situation where rehabilitation therapy with hearing aids is the only treatment option, ISSNHL is an exception which can be treated medically if identified early enough. **Aims and Objectives:** The aim of the study was (i) to calculate the recovery of hearing and other symptoms in patients diagnosed of ISSNHL treated with medical management as per institutional protocol and (ii) to determine the association between recovery with medical management and factors such as time of presentation and comorbidities in patients with ISSNHL. **Materials and Methods:** In the Department of ENT, MCH, Kottayam, a protocol for the management of ISSNHL was worked out as per guidelines from standard otology textbooks. All patients with suspected ISSNHL were admitted. Hearing assessment was done using pure tone audiometry during inpatient care and on discharge of the patient. Patients were discharged after completion of the treatment and followed up for a period of at least 6 months. **Results:** The inference of our study is that cases who presented early in the first 24–48 h of onset of symptoms have maximum chance of recovery irrespective of associated comorbidities. **Conclusion:** The study highlights the fact that ISSNHL is and should be considered as a medical emergency.

**Key words:** Sudden; Sensorineural; Hearing loss; Idiopathic sudden sensorineural hearing loss

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## INTRODUCTION

Idiopathic sudden sensorineural hearing loss (ISSNHL), though a well-known entity, is always an enigma, as no one is exactly sure about the etiology. It lacks a proper diagnostic definition and the treatment is vague. A lot of theories have been postulated for explaining the pathology as well as for treatment. This study is about our experience in the treatment of ISSNHL according to the protocol that was followed in the Department of ENT, MCH, Kottayam.

Various theories have been proposed to explain the etiology of ISSNHL as listed below:<sup>1</sup>

- Idiopathic – Viral infection – Vascular disruption – Autoimmune process
- Toxic

- Infection
- Immune mediated
- Neoplastic
- Neurologic
- Circulatory
- Traumatic.

Among these varying theories, the most important postulates are viral infections, vascular occlusion, membrane breaks, immune mediated, and activation of cochlear nuclear factor Kappa.<sup>2</sup>

The most accepted available definition for ISSNHL is provided by National Institute on Deafness and other Communication Disorders<sup>3</sup> which states that ISSNHL can be defined as follows:

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- Rapid loss of hearing over a period of up to 3 days
- At least 30 dB in three contiguous frequencies
- Should be considered a medical emergency.

Regarding the definition for improvement, as per literature, a prior pure tone audiometry (PTA) taken before the hearing loss occurred is necessary. However, almost always this is unavailable. Furthermore, an improvement of at least 10 dB in PTA after treatment has been described as recovery, this is impractical since a patient with 80 dB hearing loss won't appreciate any change if his hearing improved to 70 dB. As such an arbitrary definition for improvement taking into account, the recovery experienced by the patient has to be considered on a pragmatic basis.

Volumes of literature are available describing the merits and demerits of differing modalities of treatment which are proposed for ISSNHL. Most of them are vasodilators, anti-edema measures, and multivitamin supplements.<sup>4</sup> There are hordes of unexplained therapeutic options too. The best option will be to formulate a protocol rationally and treat patients accordingly.

#### Aims and objectives

The objectives of the study were as follows: (i) To calculate the recovery of hearing and other symptoms in patients diagnosed of ISSNHL treated with medical management as per institutional protocol and (ii) to determine the association between recovery with medical management and factors such as time of presentation and comorbidities in patients with ISSNHL.

## MATERIALS AND METHODS

#### Type of study

Descriptive study – Case series.

#### Inclusion criteria

All patients admitted with ISSNHL during the time period of the study.

#### Exclusion criteria

Patients lost in follow-up within 6 months of discharge.

#### Data collection

Through questionnaire of symptoms given to patients at the time of admission, at the time of discharge and subsequent follow-ups.

#### Statistical analysis

Microsoft Excel and Statistical Package for the Social Sciences software were used for data entry and analysis.

Clearance for the study was obtained from the Institutional Ethics Committee of Government Medical College, Kottayam, after due procedure. Protocol for treatment was finalized in the department verifying the findings in various standard ENT textbooks and journal publications.<sup>4,6</sup>

Patients who presented in the ENT outpatient department (OPD)/casualty with complaints of sudden loss of hearing were admitted. Consent for the study was taken from patients. Treatment was given according to the protocol formulated in the Department of ENT, MCH, Kottayam. Hearing assessment of the patient was done on admission, at the time of discharge, and during subsequent review. During the time period from July 2011 to June 2012, there were 21 cases. The main complaints of the patients were hearing loss, tinnitus, and vertigo. Patients were evaluated by tuning fork tests, PTA, routine blood examination, thyroid function tests, venereal disease research laboratory (VDRL), fasting lipid profile, and MRI brain. The treatment protocol was the following:<sup>7</sup>

Low-molecular-weight dextran (LMW dextran)<sup>8</sup> – 500 ml over first 6 h, 1000 ml over next 24 h, 1000 ml over the next 24 h, and the past 500 ml over another 24 h.

- Inj. Dexona<sup>9</sup> 8 mg iv tid given during IP care if there was no contraindication
- Tab. Acyclovir<sup>10,11</sup> 800 mg 5 times daily given for 5 days
- Tab. Betahistine 16 mg bd given
- Tab. Repavarine 60 mg twice daily
- Inj. Neurobion 3 doses.

Patients were discharged after the completion of LMW dextran infusion. Hearing assessment by PTA was performed on discharge and patients were reviewed after 14 days. After discharge, they were advised multivitamins and supportive measures. Subsequent PTA was performed 1 month and 6 months post-discharge. Steroids were not prescribed for diabetics, all the other treatment modalities remained the same.

## RESULTS

Distribution of the patients according to age and gender is presented in Figure 1. The complaints with which patients presented to ENT OPD/casualty are presented in Table 1. The varying degrees of hearing loss which patients had on assessment are shown in Figure 2. Associated comorbidities of the patients are presented in Figure 3. Period of presentation of the cases is shown in Table 2. At the end of 6 months, out of the total 21 cases who presented with hearing loss, 12 of them had significant recovery from a mean hearing loss of 79.2 dB to 26.3 dB hence achieving 57% improvement. All five patients who presented in the

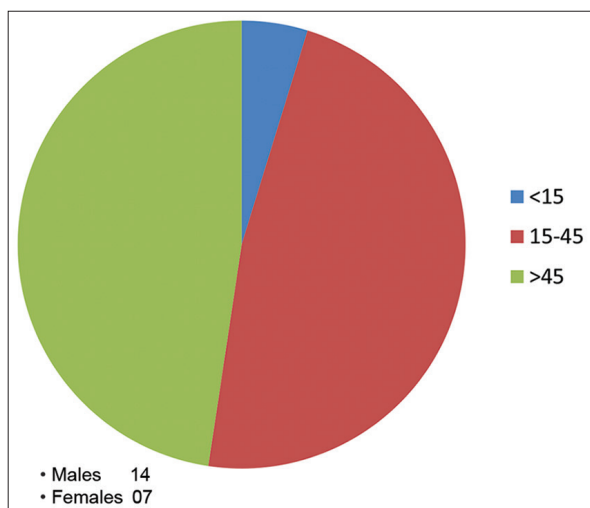


Figure 1: Age distribution of the study group

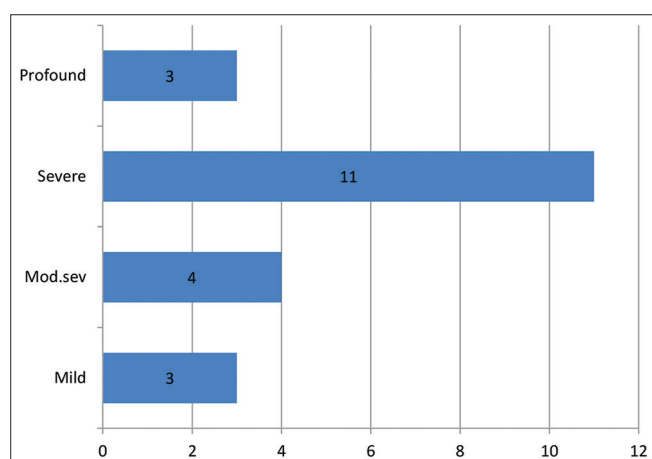


Figure 2: Varying degrees of hearing loss which patients had on assessment

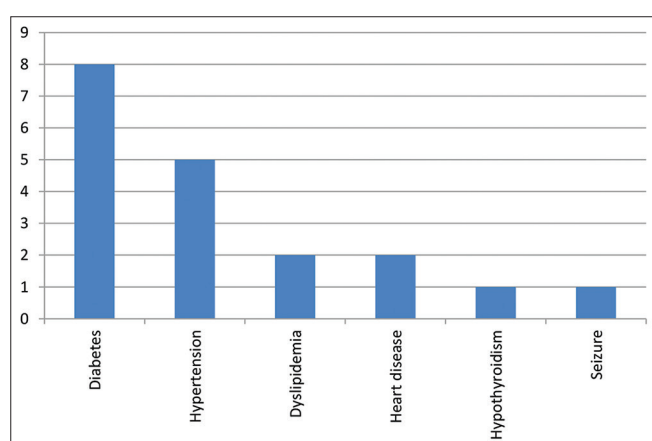


Figure 3: Comorbidities associated

initial 48 h had excellent recovery of hearing. Varying degrees of hearing improvement were noticed as the time period increases. Of the 15 cases of tinnitus, 11 of them improved completely during the IP care period itself, achieving 73%

Table 1: Complaints with which patients presented to ENT OPD/Casualty

Complaints	No. of patients
Hearing loss	21
Tinnitus	15
Vertigo	5

Table 2: Period of presentation of the cases

Period of presentation	No. of patients
<48 h	5
2-10 days	7
>10 days	9

recovery rate which is highly significant, tinnitus being one of the most difficult symptoms to treat. Five cases had vertigo recovered completely during the IP management period. No new comorbidities or pathology was diagnosed in the patients during routine blood examination, thyroid function tests, VDRL, fasting lipid profile, and MRI brain.

## DISCUSSION

ISSNHL is a well-known clinical condition characterized by a sudden occurrence in one or both ears of sensorineural hearing loss of more than 30 dB in at least three contiguous audiometric frequencies over a time course of no more than 72 h. Its etiology is rather obscure and may involve a vascular, viral, or autoimmune cause. Treatment for the condition is not uniform throughout the world.

We treated 21 patients diagnosed of ISSNHL with the protocol formulated in the department and achieved hearing recovery in 57% of cases and almost complete recovery of tinnitus and recovery. The most important lesson that we got from the study is about the time of presentation, patients who presented in the initial 48 h period of hearing loss improved significantly, all five of them from a mean of 79.2 dB hearing loss to 26.3 dB loss irrespective of the age, sex, and comorbidity factors. All those who presented later than 10 days of hearing loss had a poor outcome, none of the nine patients showed any improvement. Tinnitus which is a very difficult to treat symptom resolved in 73% of the cases during the IP management itself even in those who did not show any improvement in hearing, thereby implying that the management has some merit even in late presenters and hence needs more studies. Association of the treatment results with diabetes mellitus also needs special mention. Of the eight cases of diabetes mellitus whom we withheld steroids, which is widely recognized as one of the major treatment plans in ISSNHL, six of them had significant improvement, thereby questioning whether steroids are the mainstay of treatment. It also signifies the

need for giving blanket treatment using vasodilators and supportive measures in all cases of ISSNHL. The battery of investigations which we did for the cases did not yield any new pathology identification, thereby confirming the fact that all cases were indeed idiopathic.

A wide search of literature provided research papers from all over the globe and they were unanimous in calling the condition as an enigma and difficult to treat. Representative papers from around the globe, Haberkamp and Tanyeri<sup>12</sup> from the US, Schweinfurth et al.,<sup>13</sup> Mosnier et al.,<sup>14</sup> from Europe, and Foden et al.,<sup>15</sup> from Australia, advocate steroids as the only treatment option available for idiopathic hearing loss. Moreover, all these papers raise the question of long-term effectiveness of steroids too, further adding that most cases undergo spontaneous resolution over a period of time. Kuhn et al.,<sup>16</sup> provided a very detailed paper on the subject enumerating a lot of agents used for the treatment of ISSNHL around the world including steroids, antivirals, anti-inflammatory agents, antimicrobials, calcium antagonists, vitamins, essential minerals, vasodilators, volume expanders, defibrinogenators, diuretics, hyperbaric oxygen, and bed rest, although the actual efficacy of many modalities is questioned. Few papers published in India<sup>17-19</sup> have used treatment agents similar to our study, namely, steroids, vasodilators, and supportive therapy with multivitamins. Current literature suggests intratympanic steroids are equivalent to oral steroid therapy, primary combined therapy is superior to either alone and intratympanic steroids should be offered for salvage therapy in ISSNHL.<sup>20</sup> The results of our study are comparable to global papers in number of patients, with slightly better recovery rates compared to other countries which may be attributed to the short duration of the study and perhaps also to the number of different agents used in therapy.

ISSNHL being a medical emergency, the short-term results are of great importance in giving confidence to the patients and they can get back to their personal and professional life without much psychological effects of decreased hearing. Hence, the duration of this study was sufficient in assessing the immediate effects of management. Short in patient period, regular follow-up of hearing was also appreciated well by the patients.

#### Limitations of the study

The major limitation of this study was the inability in assessing the long-term effects of management. We are unsure whether the short-term gains of hearing and tinnitus resolution were maintained over a period of time. Hence, it is imperative that follow-up of few years should also be done to ascertain the long-term relief.

## CONCLUSION

We can safely conclude from the study that time is the most important determinant in the ultimate outcome of ISSNHL, recovery rates of up to 100% can be achieved in early presenters. Although we have lots of surgical emergencies, ISSNHL should be rightly considered as a medical emergency<sup>1</sup> and they should be immediately admitted and provided with all the necessary drugs without any withholding as this is a salvage treatment. This is all the more important in diabetic cases where apart from steroids, all the other drugs should be given in the appropriate doses. Even with late presenters, we could achieve a recovery rate of 50% which we can guarantee them. This treatment protocol also addresses the associated symptoms of ISSNHL like tinnitus which is usually very difficult to treat and vertigo which can be very troublesome. As long as there are no clear reports regarding the etiology, diagnosis, and management of ISSNHL, this is the best treatment option we can offer to such patients.

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**Authors' Contributions:**

**AM** - Concept, coordination, statistical analysis and interpretation, preparation of manuscript, and revision of the manuscript; **JJK** - Concept and design of the study, prepared first draft of manuscript; **JM** - Interpreted the results; reviewed the literature, and manuscript preparation.

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