Sudden Sensorineural Hearing Loss - Prognostic Factors

Waseem Ahmad Shah, Fouzia Nazir

INTRODUCTION
Sudden sensorineural hearing loss (SSNHL) is defined as an acute onset, within a 72-hour period, with loss over 30 dB, in at least three consecutive frequencies in one or both ears (1-2). However, in clinical practice, the definition is expanded to cases with less than 30 dB loss or in 2 consecutive frequencies (1,3). SSNHL is usually unilateral in 98-99% of cases (4-5). Many hypotheses have been advanced to explain its etiology: vascular diseases, viral inflammation, trauma, or other lesions. In most cases, the cause of SSNHL cannot be identified. Approximately 85-90% of SSNHL cases are considered idiopathic. The lack of understanding of the etiological mechanism of SSNHL has rendered the development of a specific treatment very difficult and, currently, empirical therapies are used. The prognosis of SSNHL is variously reported as ranging from cured to no change. The incidence of SSNHL is reported as 5-20/100,000 per year (5). Spontaneous recovery rates are reported to range from 32-70% by different authors (6-7). Steroids, rheological agents, vasodilators, antiviral, vitamin-electrolyte complexes, anticoagulants and hyperbaric oxygen therapy are being used for SSNHL in form of “gun-shot” therapy (2,7,8,10).

None of the treatment options have superiority on the others in randomized clinical trials (5,9,10). Certain prognostic factors have been defined for SSNHL. Increased age of the patient, presence of vestibular symptoms, accompanying systemic diseases, such as diabetes, hypertension, and hypercholesterolemia, severity of initial hearing loss, longer period between the onset of symptoms and initial therapy are known as poor prognostic factors (10). The aim of this study is to analyze various prognostic factors in Sudden sensorineural hearing loss outcome.

MATERIAL AND METHODS
A retrospective study was performed involving patients diagnosed with SSNHL between February 2016 and April 2018 in an otolaryngology department of SKIMS-MCH. All subjects with SSNHL who completed full course treatment and attended follow-up examinations were included in the study. The age of the patients was not an exclusion criteria; both adults and children were enrolled in the study group. Patients without radiological and follow-up audiological evaluations were not included. When these assessments were not available from the files, those patients were also excluded. Patients were reviewed in terms of demographic features, side of hearing loss, previous history of SSNHL and/or ear surgery, recent history of upper respiratory tract infection, season at admission, duration of symptoms before admission, radiological evaluation and results, exploration surgery with suspicion of perilymphatic fistula and results, presence of co-morbid diseases (such as diabetes mellitus, hypertension and other systemic diseases), initial pattern of audiogram, and audiological evaluation at initiation and at the end of the treatment. From the day of presentation, we provided treatment with steroids (prednisolone, 60-mg taper); 24 mg peroral betahistine with 200 mg oral acyclovir 5 times daily. The patients who had uncontrolled diabetes mellitus, coronary heart disease, hypothyroidism, hyperlipidemia, chronic kidney disease and schizophrenia were regarded as contraindications to systemic steroid administration according to internal medicine consultation. Recovery of hearing level to 20 dB HL or less for all frequencies (0.25 kHz, 0.5 kHz, 1 kHz, 2 kHz, and 4 kHz) or an improvement to a level similar to that of the healthy side was designated as cured (full recovery). Improvement of 10 dB HL or more (mean hearing level at five frequencies) was evaluated as recovered (partial recovery). Other responses to treatment were assessed as no change. Time elapsed between onset and treatment initiation was also derived from the records. Treatment initiation ≤5 days was regarded as “early” and >5 days as “delayed”, arbitrarily. The audiograms were performed on initial admission and at the end of treatment on the 10th day. Pure tone audiogram (PTA) from 250 Hz to 4000 Hz was taken into consideration for the comparison of groups. The types of initial audiograms were classified as: upward-sloping type (hearing loss more severe in low
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The outcome of SSNHL was related to the number of days until presentation and age. A long interval between presentation and advanced age were associated with lower rates of recovery. We found no significant relation to outcome for other factors. The vestibular symptom and initial mean hearing level were most strongly related to outcome. A longer period until presentation, subjective vestibular symptom, advanced age, and profound hearing loss were associated with lower rates of cure. No other factor was significantly related to the outcome. Furthermore, we considered hearing level at five frequencies separately (0.25,0.5,1,2, and 4 kHz). In patients in the no-change and cured groups, hearing levels at 2 and 4 kHz were significantly related to the outcome. Profound hearing loss at 2 kHz and mild hearing loss at 4 kHz were associated with high rates of cure.

RESULTS
The outcome of SSNHL was cured in 34 ears (28%), recovered in 62 (51%), and no change in 26 (21%). The factors most strongly related to outcome were the number of days until presentation age. A longer period until presentation and advanced age were associated with lower rates of recovery. We found no significant relation to outcome for other factors. The vestibular symptom and initial mean hearing level were most strongly related to outcome. A longer period until presentation, subjective vestibular symptom, advanced age, and profound hearing loss were associated with lower rates of cure. No other factor was significantly related to the outcome. Furthermore, we considered hearing level at five frequencies separately (0.25,0.5,1,2, and 4 kHz). In patients in the no-change and cured groups, hearing levels at 2 and 4 kHz were significantly related to the outcome. Profound hearing loss at 2 kHz and mild hearing loss at 4 kHz were associated with high rates of cure.

DISCUSSION
Sudden sensorineural hearing loss is a sophisticated process with multiple possible etiologies and treatment modalities. Approximately 85-90% are considered idiopathic. Similarly, in this study, 94.5% of the cases were found to be idiopathic (1,2).

CONCLUSION
SSNHL is a common complaint in audiologic and otolaryngologic practice. SSNHL is usually an idiopathic disease and both its treatment and outcome parameters remain controversial. We found the prognosis for SSNHL to be better in patients who present early are young and who have mild hearing loss and to be worse in those with vertigo. Although SSNHL treatment is controversial, directed therapy against discernable causes of SSNHL and corticosteroid therapy for idiopathic SSNHL are mainstays of the care of these patients.

REFERENCES
5. Piccirillo JF. Steroids for idiopathic sudden sensorineural hearing loss: some questions answered, others remain. *JAMA* 2011;305:2114-5. [CrossRef]


