International Journal of Medical and Health Research
ISSN: 2454-9142, Impact Factor: RJIF 5.54
www.medicalsjournals.com
Volume 2; Issue 6; June 2016; Page No. 01-03

Sudden sensorineural hearing dysfunction: A study of prognostic factors

[1] Abhay Kumar Pandey, [2] Deepti Pandey

[1] Department of Physiology, Government Medical College, Banda, Uttar Pradesh, India
[2] Otorhinolaryngology Consultant, SLNM Charitable Trust Hospital, Varanasi-221005, Uttar Pradesh, India

Abstract
Background: Knowledge of prognostic factors is vital in disease management and prevention. Sudden sensorineural hearing loss (SSNHL) is an ontological emergency but in majority of cases hearing recovers spontaneously. Failure of recovery is too costly for the sufferer.
Objective: Present study examines certain prognostic factors of host and disease for influence on recovery from hearing loss.
Method: 29 patients of diagnosed SSNHL, majority in their 50's were studied for their audiogram characteristics Vis a Vis a recovery or no recovery outcome. The prognostic factors examined were: age, systemic diseases (hypertension and diabetes mellitus), dizziness; degree of early stage hearing loss, type of hearing loss and time of initiating treatment. Relationship between hearing recovery rate and selected prognostic factors were observed.
Result and Conclusion Time of initiating treatment after symptoms manifest; degree of initial hearing loss and age of the affected patients, are factors determining prognosis.

Keywords: Sensorineural hearing loss; Prognostic factors; Ear; Hearing

1. Introduction

Sudden sensorineural hearing loss is uncommon but serious ontological emergency afflicting under 1 in 10000 population (1). Infections, blood vessel disease or autoimmune disorder are etiologically implicated. In consequence, antiviral drugs, vasodilators and hyperbaric oxygen therapy, stellate ganglion block, high dose steroid injections and adrenocorticotrophic hormone are variously applied in therapy (2, 3). Half the cases recover spontaneously in 2 weeks' time (4). Prognostic factors as age, degree of early stage hearing loss, timing of initiation of treatment and systemic comorbidities as diabetes, hypertension have been examined. There is however little understanding of temporal relationship between initial clinical course of disease and its recovery. Association studies of prognostic factor, treatment and recovery remain important.

2. Subjects and Method

Study was prospectively carried out in 29 diagnosed cases of sudden sensory hearing loss reporting for treatment over two year period from Jan 2008 to Dec 2009 at MGM hospital, a tertiary care centre at Navi-Mumbai. In all patients physical examination of the ear drum, cranial nerves, hearing tests including Brainstem evoked response audiometry (BERA) test and vestibular function tests were carried out. Middle or inner ear inflammation was ground for exclusion from this study. Sudden sensorineural hearing loss was diagnosed in cases with more than 30 dB hearing loss (dBHL), in three consecutive frequencies within three days of initial complaints.

Following schedule of hearing tests was observed-at admission, during hospitalization and treatment on alternate day. Examination once a week for one month after discharge was demanded and then every month for one year. Degree of hearing loss was measured using the average threshold value dBHL, derived through testing of 0.5; 1; 2 and 3 kHz using pure tone audiometry (5). Hearing loss was classified as mild - 26 to 40 dB; moderate 41-55; moderately severe (56-70 dB; severe 71 to 90; and profound above 91dB (6). Hearing threshold value was used as criterion for classification of pure tone audiometry as:- Rising: Lower threshold values in the high frequency range of 2000Hz -4000Hz, than in low frequency range of 250 to 500 Hz. Flat: Similar threshold across entire frequency ranges. Sloping: High threshold value in high frequency range than in low frequency range. Classification is not possible in cases of profound loss.

Patients were given absolute bed rest and low salt diet for 7 days. Medical therapy included 10 mg dexamethasone injections for 5 days, reduced to 7.5 mg on days 6 and 7. Post discharge, 20 mg oral daily prednisolone on 8th and 9th day, and 10 mg on day 10 was prescribed. Additionally gingko biloba extract 80mg daily was given throughout. Stellate ganglion block was done as well.

Patient's degree of recovery was classified as complete, partial, slight and no recovery (7). Complete recovery group included patients attaining hearing ability under 25dBHL. Partial recovery group had patients recovering above 15dBHL and final hearing abilities 25 to 45 dBHL. Slight recovery meant recovery under 15dBHL and final hearing ability over 45dBHL. No recovery group included patients with under 15dBHL recovery and hearing ability above 75dBHL.

The prognostic factors examined were: age, systemic diseases (hypertension and diabetes mellitus), dizziness; degree of early stage hearing loss, type of hearing loss and time of initiating treatment. Relationship between hearing recovery rate and selected prognostic factors were observed.

3. Observations and Results

Among the 29 patients of sudden sensorineural hearing loss 16 were females and 13 males. Average age was 52 years (range 11-79 years). Most affected was the age group in 6th decade, constituting 13 of 29 cases (44.8%).

Hearing recovery rates: Complete recovery was attained in 11 (37.9%) cases. 5 cases (17.2%) attained partial; 4 cases

(13.8%) attained slight and 9 (31%) cases did not recover. Overall recovery rate including slight recovery was 69% of cases.

Hearing recovery period: Mean days for complete recovery were 7; for partial recovery 13.2; for slight recovery 22.25. Patients not recovering were there without any recovery examined up to 2 months.

Onset of hearing recovery after treatment: Faster the administration of treatment more was the attained degree of recovery. Patients not showing recovery even after 2 weeks were found to fail.

4. Relation of prognostic factors to recovery rate:

Age: Higher rate of hearing recovery was found in patients under 60 year age (14, 77.7%), while cases above 60 year age faired inferior (6, 54.5%)

Systemic diseases: Hypertension, diabetes mellitus and chronic renal failure were existing comorbidities respectively in 5 (17.2%), 5 (17.2%) and 1 (3.4%) patients.

Degree of hearing loss in early stage: Recovery rate depended on degree of hearing loss at presentation. More sever the hearing loss at early stage lower were hearing recovery rates.

Pattern of initial pure tone audiogram: Sloping audiograms were displayed in 6 (20.7%); flat audiograms in 15 (51.7%); rising audiograms in 6 (20.7%) patients. 2 (6.7%) cases had profound hearing loss. Hearing recovery rate was investigated by analyzing initial audiogram patterns. Hearing recovery was observed in 10 (66.7%) subjects displaying the flat type; 4 (66.7%) subjects displaying rising type and 5 (83.3%) subjects displaying sloping type. Rest 2 had profound hearing loss. The pattern differences were statistically significant.

Starting time of treatment: The recovery rate was significantly higher in patients receiving treatment within 7 days of onset of symptom than the late recipients.

Characteristics of non-recovery group: A total of 9 patients showed no recovery. 3 of these had profound hearing loss at early stage. 3 of 5 patients who received treatment late after 7 days of complaints also did not show recovery. Major contribution to no recovery group was 5 patients in age group above 60 years. The degree of recovery was not affected by presence of absence of observed medical comorbidities.

Table: Prognostic factors and recovery profile of patients with sudden sensor neural hearing loss

Prognostic Factor	No. of Cases	Recovering (N)	Not-recovering (N)	P value (Chi^2)
Age group (yrs)				0.05
Under 60	18	14	4	
Above 60	11	6	5	
Comorbidity				
Diabetes mellitus	5	3	2	
Chronic renal failure	1	1	0	
Hypertension	5	3	2	
dizziness	5	3	2	
Initial Hearing level (dB)				0.05
Mild 26-40	4	4	0	
Moderate 41-55	6	4	2	
Mod-Severe 56-70	7	4	3	
Severe 71-90	6	5	1	
Profound ≥90	5	2	3	
Audiogram type				0.05
Sloping	6	4	2	
Flat	15	10	5	
Rising	6	5	1	
Profound loss	2	0	2	
Time of starting treatment				0.05
Within 7 days	24	18	6	
Over 8 days	5	2	3	

5. Discussion

Sudden sensorineural hearing loss is diagnosed in patients with hearing loss over 30 dB in three or more consecutive frequencies, within 3 days. In this study males were outnumbered by females and sixth decade of life was the most vulnerable period. Spontaneous recovery in 2 weeks without treatment is common occurrence in over half the cases (8, 9). In studied patients overall recovery in hearing including slight one is 68.9% and recovery occurred within 2 to 4 weeks, generally in agreement with reports (8, 9). Complete recovery occurred in average 7 days in 11 (37.9%), partial recovery occurred in 5 (17.2%) in average 13.2 days; and slight recovery in hearing function occurred in 4 (13.8%) over average 22.25 days. Such time periods too agree more or less, with other reports. Critical period for recovery suggests that hearing recovery requires hospital treatment for 7 to 14 days. Recovering patients should be monitored in outdoor for 2 months at least.

Establishment of rational treatment strategy providing best outcome is warranted. In the study, six prognostic factors were examined regarding influence on recovery rate. Significantly higher recovery occurred in patients under 60 year of age. Older patients need additional treatment plan. Another study found patients with very severe hearing loss at the outset to exhibit 30% recovery rate. In contrast, 86.3% recovery rate in moderate and less severe initial hearing loss cases was seen (10). Different initial patterns of pure tone audiograms did not influence recovery rates, contrary to such earlier reports (4, 11). Many patients who failed to recover or had received initial medical care after delay over 7 days since complaints.

6. Conclusion

Acute sensorineural hearing loss is an otologic emergency. Time of initiating treatment after symptoms manifest; degree of initial hearing loss and age of the affected patients, are factors determining prognosis.

7. References

1. Byl FM Jr. Sudden hearing loss: eight years' experience and suggested prognostic table. Laryngoscope. 1984; 94(5-1):647-661.
2. Haberkamp TJ, Tanyeri HM. Management of idiopathic sudden sensor neural hearing loss. Am. J Otol. 1999; 20(5):587-592.
3. Wei BP, Mubiru S, O'Leary S. Steroids for idiopathic sudden sensorineural hearing loss. Cochrane Database Syst Rev. 2006; 25(1):CD003998.
4. Mattox DE, Simmons FB. Natural history of sudden sensorineural hearing loss. Ann Otol Rhinol Laryngol, 1977; 86(4-1):463-480.
5. Melnick W. American National Standard specifications for audiometers. ASHA. 1971, 13(4):203-206.
6. Maggie Kuhn, Selena E. Heman-Ackah, Jamil A. Shaikh, Pamela C. Roehm Sudden Sensorineural Hearing Loss: A Review of Diagnosis, Treatment, and Prognos is Trends Amplif. 2011; 15(3):91-105.
7. Liu SC, Kang BH, Lee JC, Lin YS, Huang KL, Liu DW, Comparison of therapeutic results in sudden sensorineural hearing loss with/without additional hyperbaric oxygen therapy: a retrospective review of 465 audio logically controlled cases. Cline Otolaryngol. 2011, 36(2):121-128.
8. Lee MY, Suh MW, Rhee CK, Jung JY. Clinical Characteristics of Sudden Sensorineural Hearing Loss with Aggravation during Treatment. Korean J Otorhinolaryngol-Head Neck Surg. 2008; 51(11):973-978.
9. Lee HS Lee YJ Kang BS Lee BD Lee JSA Clinical Analysis of Sudden Sensor neural Hearing Loss Cases Korean. J. Audiol. 2014; 18(2):69-75.
10. Tiong TS Prognostic indicators of management of sudden sensor neural hearing loss in an Asian hospital. Singapore Med. J. 2007; 48(1):45-49.
11. Shin SO. Clinical characteristics and management of sudden sensorineural hearing loss. Korean. J. Audiol. 2011; 15:1-7.