

# Prognostic Indicators In Idiopathic Sudden Sensorineural Hearing Loss In A Malaysian Hospital

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## Abstract

This is a retrospective study to review the prognostic indicators in management of idiopathic sudden sensorineural hearing loss (SSNHL) in patients treated at Sarawak General Hospital Malaysia from 2001 to 2003. A total of 66 patients were selected. All patients had follow-up audiograms for 3 to 12 months. There were 34 females and 32 males, aged 15 to 80 years old (mean age 49, SD 16.91). 64 patients had unilateral SSNHL and 2 bilateral. Hearing improvement was noted in 42 patients (64%). Six audiogram patterns were observed with good prognostic indicators in patterns 1 (sloping-up, 91%) and 4 (mid-dipping, 100%). The hearing improvement was noted in majority of the patients with mild or moderate degree of hearing loss. Patients aged 21 to 40 appear to have better prognosis than those aged younger or older. Treatment started in the first or second week since onset of hearing loss had better hearing improvement (79%, 76%) than started in later weeks (<50%). Percentages of hearing improvement when tinnitus absent or present are much the same. Poor prognosis is noted in vertigo (40%) than without vertigo (74%).

## INTRODUCTION

Sudden sensorineural hearing loss (SSNHL) is a symptom. It is defined as sudden onset occurring over a period of up to three days and is sensorineural of more than 30dB over 3 contiguous pure tone frequencies. The incidences are variable up to 20/100,000 population, often with no known causes and it is then called idiopathic SSNHL.

This review is to determine the prognostic indicators in management of idiopathic sudden sensorineural hearing loss in otorhinolaryngology patients treated in Sarawak General Hospital, Malaysia.

## MATERIALS AND METHODS

From the Medical Records of the Department of Otorhinolaryngology of the Sarawak General Hospital, 74 patients treated over a period of three years from 2001 to 2003 were reviewed. Their data on age, gender, initial symptoms of hearing loss, tinnitus, vertigo and associated conditions if any, investigations including pure tone audiograms and likely causes of the hearing loss, durations of onset of symptoms to treatment, the patterns of audiograms, the audiometric progression of hearing, and the medications used were collected and analyzed.

The patients with SSNHL were all treated with

Methycobalamin tablet 500 micrograms three times a day and Neurobion tablets two daily. All patients were followed up progressively over periods from 3 months to 12 months and pure tone audiograms were done in each of the follow-up visits to check hearing progression. Those who failed to improve were investigated with computerized tomography or magnetic resonance imaging for organic causes such as acoustic neuroma.

The audiograms were done on the hearing thresholds of 5 dB increments in the frequencies range 0.25, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, 6.0 & 8.0 Hz.

The hearing improvement in this review was taken as improvement in hearing from initial thresholds by more than 20 dB in at least 2 contiguous frequencies. This hearing improvement was evaluated in relation to pure tone audiogram patterns, severity of hearing loss, tinnitus, vertigo, age of the patients and durations from symptom onset to treatment.

## RESULTS

Of the 74 patients reviewed 8 were found to have known causes, 4 cholesteatoma, 1 syphilis and 3 herpes zoster oticus. These 8 patients were excluded from the analysis.

This left with 66 patients who had idiopathic SSNHL.

The patients' ages ranged from 15 to 80 years old with a mean of 49 (SD 16.91). Ratios of gender were male to female 36 to 30 and of right to left ears 34 to 32.

64 patients had unilateral hearing loss and 2 bilateral. Hearing improvement was noted in 42 patients (64%). There were two patients with bilateral hearing loss and they did not have the hearing improvement.

The durations from symptom onset to treatment ranged from 1 day to 2.5 months and the main presenting symptoms were deafness in 65 patients, tinnitus 38, and vertigo 20, with some patients having more than one presenting symptom. One patient had vertigo as the main presenting symptom.

Various patterns of initial pure tone audiograms were noted and could be generalized into 6 general patterns as shown in figure 1. The hearing improvement in various patterns of audiograms in relation to severity of initial hearing loss is shown in Table 1.

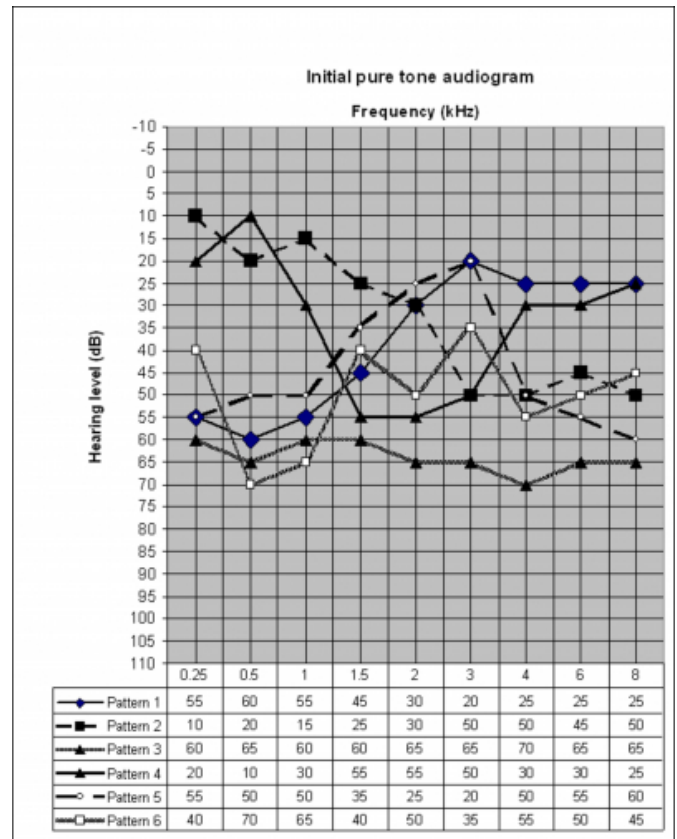
**Figure 1**

Table 1: The hearing improvement in various patterns of audiograms in relation to severity of initial hearing loss

Hearing improvement (>20dB) in relation to severity of initial hearing loss (mild 30-40dB, moderate 50-70dB, severe >80dB)				
Audiogram pattern	All severity	Number patients improved/ initial patient total Severity breakdown into mild, moderate & severe		
Pattern 1	10/11(91%)	mild 4/4 (100%),	moderate 5/5 (100%),	severe 1/2 (50%)
Pattern 2	12/20(60%)	mild 6/8 (75%),	moderate 5/7 (71%),	severe 1/5 (20%)
Pattern 3	4/8(50%)	mild 2/3 (67%),	moderate 1/2 (50%),	severe 1/3 (33%)
Pattern 4	6/6(100%)	mild 4/4 (100%),	moderate 2/2 (100%)	severe 0/0 (0%)
Pattern 5	9/16(56%)	mild 4/6 (67%),	moderate 3/5 (60%)	severe 2/5 (40%)
Pattern 6	1/5(20%)	mild 1/3 (33%),	moderate 0/2 (0%),	severe 0/0 (0%)

**Figure 2**

Figure 1 : The 6 general patterns of pure tone audiograms



It was observed in Table 1 the good prognostic indicators in patterns 1 (sloping-up, 91%) and patterns 4 (mid-dipping, 100%) and in majority of the patients with mild and moderate degree of hearing loss. Pattern 1 concerns mainly low tone hearing loss and Pattern 4 the mid tone loss.

The hearing improvement in relation to age was found to be 77% in the age group 21-40 years old and 56% and 43% in the age groups less than 21 and more than 40 years old respectively.

The percentages of patients having hearing improvement of more than 20 dB were found to be 79% treated in 1-7 days, 76% in 8-14 days, 50% in 15-21 days, and 33% in 21 days -75 days, after onset of hearing loss.

The hearing improvement was found in 24 out of 38 patients with tinnitus (63%) and 18 out of 28 patient without tinnitus (64%). In the 20 patients with vertigo 8 had the hearing improvement (40%) and in the remaining 46 patients who did not have vertigo 34 had the hearing improvement (74%).

**DISCUSSION**

Review of literature in the past has shown no set threshold of

hearing improvement as it varies individually from more than 10dB<sub>6</sub> to 20dB<sub>7</sub>. On the method mentioned above, as the increments during audiogram testing are by 5 dB steps, the minimal threshold of hearing improvement in this review is 25dB.

Prognostic indicators or factors have been published in the past decades in many countries. In Malaysia there was one review in 1993 by Amin<sub>4</sub> who reviewed 32 patients treated in University Hospital University Malaya Kuala Lumpur. He found good prognostic indicators when treatment started within 5 days of onset of hearing loss and bad prognostic indicators in bilateral hearing loss with vertigo or in profound hearing loss.

In 1984, Byl published a prospective study conducted over 8 years on 225 patients with sudden hearing loss and found 4 main factors including time since onset of hearing loss, age, vertigo and audiogram. The results mentioned above in this review concern all of these factors. Byl reported audiogram finding of patients with profound hearing loss to have significantly decreased recovery rates but no audiogram patterns in relation to hearing improvement. However, in this review, 6 audiogram patterns were observed and the results showed significant hearing improvement of 91% or more in patients with audiogram patterns 1 and 4. Moreover, it is worth noted that audiogram pattern 4 happened (though the number of patients involved being small) to have 100% of the patients with the hearing improvement which is in good comparison with the findings by Laird<sub>8</sub> in 1983 whose patients of the same audiogram pattern also had excellent hearing prognosis.

Severity of initial hearing loss is a main prognostic indicator of hearing improvement in SSNHL. Bad prognosis has been found in patients with severe or profound SSNHL by Byl<sub>9</sub>, Amin<sub>4</sub>, Mosnier<sub>10</sub>, and Sano<sub>11</sub>, just to mention a few. Such observations were found in the results of this review, which also showed that the hearing improvement was seen in patients with mild or moderate sensorineural hearing loss.

Moreover in consideration of the audiogram patterns, in the patterns 1 and 4, the hearing improvement appeared to be further enhanced when the hearing loss was mild or moderate.

The initial symptom of vertigo is found in this review to be a bad prognostic indicator and this observation is also found in other studies in the past by Byl<sub>9</sub> Amin<sub>4</sub>, Nakashima<sub>12</sub>, and the likely extensive damage of cochlea to involve the

vestibular apparatus had been suggested.

Another prognostic indicator well known over the years is the duration of onset of hearing loss to treatment, reportedly to be in the first week to give the good hearing improvement<sub>4,9</sub>. However in this review, the hearing improvement was also found in patients who were treated on 8-14 days after the onset of hearing loss with 76% benefited.

### **CONCLUSION**

66 patients with SSNHS were reviewed in an Asian hospital. Good prognostic indicators in this study are age 21 to 40, mild or moderate hearing loss, no vertigo, treatment started first 2 weeks from onset of hearing loss, sloping-up and mid-dipping audiogram patterns. These indicators are in well consistent with the past reports except to emphasize that this review also shows reasonably good prognosis when the patients were treated in the second week from the hearing loss onset, and in patients with the audiogram patterns 1 and 4.

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