

Idiopathic Sudden Sensorineural Hearing Loss

KWANCHANOK YIMTAE, M.D.*,
SUPAPORN SRIOMPOTONG, M.D.*,
SUTHEE KRAITRAKUL, M.D.*

Abstract

Background : Sudden sensorineural hearing loss is one of the most controversial unsolved mysteries in Otolaryngology. Lack of a universally accepted definition of sudden sensorineural hearing loss, insufficient knowledge of pathogenesis, lack of a standard method for evaluating the patients, in addition to a high spontaneous recovery rate, all complicate the study of sensorineural hearing loss and the investigation of different treatment modalities.

Objective : To study the clinical manifestation and prognostic factors, which influence the recovery of hearing in sudden sensorineural hearing loss.

Patients and Method : Patients with idiopathic sudden sensorineural hearing loss who were admitted to Srinagarind Hospital from January 1994 to December 1998 were included. The clinical manifestations, audiograms and investigations of these patients were analysed.

Results : Of the fifty-six patients, who met the criterion, 34 were females and 22 males. The average age of onset was 43.7 years (SD = 13.46, range = 13-66 years). The onset of hearing loss was sudden in 50 per cent of cases, whereas, 46.4 per cent of cases were noted on awakening in the morning and the remainder had rapidly progressive hearing loss. The hearing loss was unilateral in 92.9 per cent of cases. 96.4 per cent of the patients had tinnitus and 66.1 per cent of the patients had vertigo. 64.3 per cent of the patients had some degree of recovery (complete recovery in 28.6% and partial recovery in 35.7%). The severity of hearing loss significantly influenced the outcome of the patients.

Conclusion : Approximately two-thirds of the patients with idiopathic sudden hearing loss had some degree of recovery. Among contributing factors, only the severity of hearing loss significantly influenced the prognosis.

Key word : Sudden Sensorineural Hearing Loss, Idiopathic, Prognosis

YIMTAE K, SRIOMPOTONG S, KRAITRAKUL S
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* Department of Otolaryngology, Faculty of Medicine, Srinagarind Hospital, Khon Kaen University, Khon Kaen 40002, Thailand.

Sudden sensorineural hearing loss is one of the most controversial unsolved mysteries in Otolaryngology. It causes a frightening experience for the patient and a frustrating one for the physician. Lack of a universally accepted definition of sudden sensorineural hearing loss, insufficient knowledge of pathogenesis, lack of a standard method for evaluating the patients, in addition to a high spontaneous recovery rate, all complicate the study of sudden sensorineural hearing loss and the investigation of different treatment modalities.

One useful definition of sudden sensorineural hearing loss is a greater than 30-dB sensorineural hearing loss occurring in at least three contiguous frequencies that develops over a period of less than three days⁽¹⁾. Sudden hearing loss is most likely a symptom rather than a discrete disease, merely representing the end result of many insults to the inner ear. Since most of the patients have no definable causes, they are defined as idiopathic. The theories explaining the idiopathic sudden sensorineural hearing loss include viral, vascular, membrane rupture, and autoimmune causes. None of these theories are conclusive or proven.

Treatment regimens have been suggested to combat each of these causes. The treatment regimens vary and include steroids, vasodilators, diuretics, anticoagulants, plasma expanders, intravenous contrast dye, carbogen, and stellate ganglion block, etc⁽²⁾. The results of these various regimens have been reported to show improvement in hearing in 50 per cent to 90 per cent of patients^(1,3-14). Compared with the 40 per cent to 70 per cent spontaneous recovery rate in many studies^(1,4,6-9,13,14), the effectiveness of these various regimens is doubtful. Although patients with idiopathic sudden sensorineural hearing loss are heterogeneous, there are diverse factors that influence the prognosis. These factors include the patient's age, presence of vestibular symptom, duration of symptom, audiometric pattern, severity of hearing loss, and the erythrocyte sedimentation rate (ESR)^(2,7,12,14,15).

This report is a descriptive study of clinical manifestations and prognostic factors that influence the recovery rate in idiopathic sudden sensorineural hearing loss.

PATIENTS AND METHOD

Patients with idiopathic sudden sensorineural hearing loss who were admitted to Srinagarind Hospital from January 1994 to December 1998. The clinical manifestations, audiograms and investigations of these patients were studied. The patients who had a positive serum for syphilis and HIV were excluded from the study. The severity of hearing loss was classified according to Bye, 1984.

Criteria for recovery was defined as:

1. Complete recovery. The hearing was returned to the pre-existing level or within 10 dB when compared with the normal side.

2. Partial recovery. The hearing was improved more than 10 dB when compared with initial loss.

3. No recovery. The hearing was not improved more than 10 dB when compared with the initial loss.

Statistical analysis were Chi-square and Fisher-Exact's methods. A p-value less than 0.05 was considered statistically significant.

RESULTS

The clinical features of the fifty-six patients, who met the criterion, are shown in Table 1. 34 patients were females and 22 were males. The average age of onset was 43.4 ± 13.7 years and ranged from 13 to 66 years. The hearing loss was unilateral in 92.9 per cent of cases and bilateral in 7.1 per cent of cases. The onset of hearing loss was sudden in 50 per cent of cases, whereas, 46.4 per cent of cases noted the hearing loss upon awakening in the morning. The remainder did not know the time of onset but had rapidly progressive hearing loss. The mean duration of symptoms before attending a physician was 5.2 ± 4.0 days. 78.6 per cent of the patients had hearing loss within 1 week. 96.4 per cent of the patients had tinnitus, and 66.1 per cent of the patients had vertigo. Aural fullness was found to be an associated symptom in only 3 cases (5.4%) in our study. The associated conditions commonly found were diabetes mellitus, hypertension, viral infections, minor trauma, uremia, autoimmune, and hyperlipidemia, respectively. The average pure tone threshold of 500-2,000 Hz at the time of initial presentation was 78.8 ± 25.3 dB. Distributions of severity of hearing loss are shown in Table 2. Most of our patients

Table 1. Clinical features of 56 patients with idiopathic sudden sensorineural hearing loss.

| Clinical features | |
|--|-------------|
| Age (yrs) | 43.4 ± 13.7 |
| Sex (male/female) | 22 / 34 |
| Side (left / right / both) | 30 / 22 / 4 |
| Duration of symptoms (days) | 5.2 ± 4.0 |
| Onset of symptoms | |
| Sudden (%) | 50 |
| On awaking (%) | 46.4 |
| Rapidly progressive (%) | 3.6 |
| Symptoms | |
| Tinnitus (%) | 96.4 |
| Vertigo (%) | 66.1 |
| Aural fullness (%) | 5.4 |
| Pure tone average at 500-2,000 Hz.(dB) | 78.8 ± 25.3 |
| Associated conditions (%) | |
| Diabetes mellitus | 25 |
| Hypertension | 14.3 |
| Viral illness | 12.5 |
| Minor trauma | 8.9 |
| Uremia | 7.1 |
| Autoimmune | 5.4 |
| Hyperlipidemia | 3.6 |

Table 2. Severity of hearing loss (classified according to Bye, 1984).

| Severity of hearing loss | No. | % |
|--------------------------|-----|-------|
| Mild (24-34 dB) | 2 | 3.57 |
| Intermediate (35-54 dB) | 8 | 14.29 |
| Severe (55-74 dB) | 13 | 23.21 |
| Profound (≥ 75 dB) | 33 | 58.93 |

had severe to profound hearing loss. The patterns of the patients' initial audiograms are shown as Fig. 1. There was no statistical difference of any parameters between males and females, except the ESR.

The results of laboratory investigations are shown in Table 3. The most common abnormal investigation was an elevated ESR (27/44). The abnormal complete blood counts, usually found in this study, were mild leukocytosis. There were 41 patients who were investigated for the possibility of acoustic neuromas. None of these patients had acoustic neuroma. Most

Table 3. Laboratory results.

| Investigations | No. of patients with abnormal/ No. of test patients | % |
|----------------------|--|------|
| Complete blood count | 22/56 | 39.3 |
| ESR | 27/44 | 61.4 |
| Autoimmune profile | 3/56 | 5.4 |
| Blood chemistry | 21/56 | 37.5 |

of the sudden sensorineural hearing loss patients (75.0%) were treated with steroids, vasodilator and intravenous methylcobalamin. The others received vasodilator and/or intravenous methylcobalamin. The outcomes of hearing recovery are shown in Table 4. Overall recovery in this study included complete recovery in 28.6 per cent, partial recovery in 35.7 per cent, and no recovery in 35.7 per cent of patients. Prognostic factors such as age, vertigo, duration of symptoms, ESR, audiometric patterns, and severity of hearing loss were tested for predictive value. Only the severity of hearing loss influenced the prognosis for recovery (*p*-value = 0.001).

DISCUSSION

Several studies have examined the prognostic factors for recovery in sudden sensorineural hearing loss. Bye suggested that the important prognostic indicators were severity of initial hearing loss and vertigo, time to initial audiogram, and elevated sedimentation rate⁽²⁾. The other indicators were age > 60 and < 15 years, mid-frequency audiogram configuration, and hearing status of the opposite ear. Leong and Loh found that severity of hearing loss, high tone loss, longer time from onset to initial audiogram, hypofunctioning vestibular organ, and age > 60 years or < 19 years were associated with poor recovery of hearing⁽¹²⁾.

Fetterman et al retrospectively studied 837 patients with sudden sensorineural hearing loss⁽¹⁴⁾. They found that the severity of hearing loss at the time of initial evaluation related directly to hearing improvement. Patients with poorer hearing at the time of the first hearing test were more likely to improve. The other factors, which were found to correlate with the degree of hearing recovery, were the patient's age and time from onset to treatment. The presence of vestibular

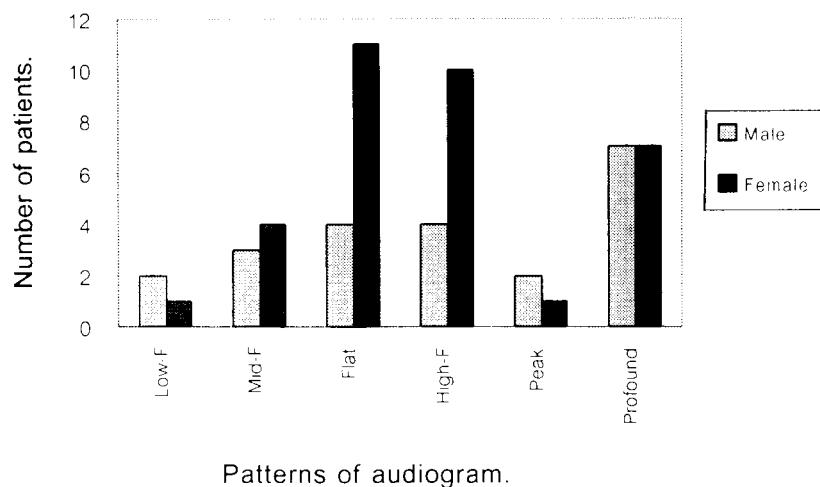


Fig. 1. Distribution patterns of audiograms with idiopathic sudden sensorineural hearing loss.

Table 4. Severity of hearing loss and recovery rates (classified according to Bye, 1984).

| Severity of hearing loss | Complete recovery | % | Partial recovery | % | No recovery | % |
|--------------------------|-------------------|------|------------------|------|-------------|------|
| Mild (24-34 dB) | 1 | 50 | 0 | 0 | 1 | 50 |
| Intermediate (35-54 dB) | 4 | 50 | 0 | 0 | 4 | 50 |
| Severe (55-74 dB) | 5 | 38.5 | 1 | 7.6 | 19 | 53.8 |
| Profound (> 75 dB) | 6 | 18.2 | 19 | 57.6 | 8 | 24.2 |

symptoms and ESR did not seem to influence outcome in their study.

The overall recovery rates in our study showed that one-third of the patients with idiopathic sudden sensorineural hearing loss had a reasonable chance for complete hearing recovery, one-third had partial hearing recovery and the other one-third had no recovery. When analyzing the factors that might influence the prognosis for recovery, only the initial audiogram at the first visit influenced the outcome. The relationship between the percentage of each type of hearing recovery and the degree of hearing loss is shown in Fig. 2. There was a decreased complete recovery rate with increased severity of hearing loss. This finding was similar to Bye's study. However, the complete recovery rates of various hearing losses in our study were lower than that of Bye. A comparison of our study to that of

Bye is shown in Table 5. This might be caused by fewer patients with mild and moderate hearing loss in our study.

Interestingly, the greater the hearing loss, the higher the frequency of partial recovery. The percentage of patients with profound hearing loss who recovered was 75.8 per cent. This was similar to the finding in Fetterman's study. Fetterman explained this finding as possibly reflecting spontaneous improvement in patients with sudden hearing loss. The people with severe initial hearing loss had more room to improve, while those with better initial hearing might already have improved before presentation and thus might show less gain in hearing when tested(14). In our opinion, this observation might be caused by the attitude of the patients. The patients with mild and moderate hearing loss had some degree of hearing recovery after a few days so they might not

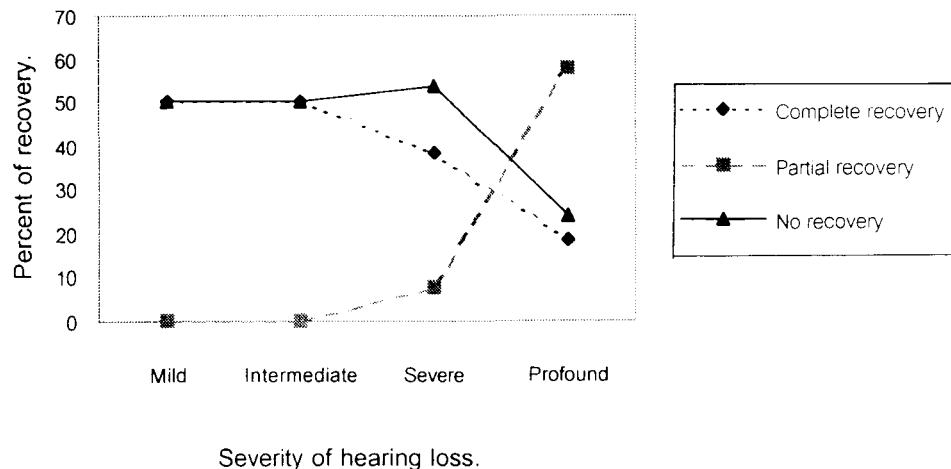


Fig. 2. Relationship of recovery and severity of hearing loss.

Table 5. Comparison of prognosis of normal or complete recovery between Bye's study and the present study.

| Severity of hearing loss | Bye's study | | The present study | |
|--------------------------|-----------------|---------------------|---------------------|-------|
| | No vertigo % | Severe vertigo % | Severe vertigo % | % |
| Mild (24-34 dB) | 90 | | 85 | 50 |
| Moderate (35-54 dB) | 80 | | 70 | 50 |
| Severe (55-74 dB) | 70 | | 45 | 38.50 |
| Profound (≥ 75 dB) | 60 | | 15 | 18.20 |

seek a physician's advice, while the patients who had no recovery or who had severe or profound hearing loss sought help earlier.

SUMMARY

Approximately two-thirds of the patients with idiopathic sudden hearing loss had some degree of recovery. Among the contributing factors, only the severity of hearing loss significantly influenced the prognosis. The patients who had a more severe initial hearing loss were

less likely to recover completely, but more likely to partially recover.

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ประสาทหูเสียเฉียบพลันชนิดที่ไม่ทราบสาเหตุ

ขวัญชานก อิมแท้, พ.บ.*
สุภาภรณ์ ศรีรัมโพธิ์ทอง, พ.บ.*; สุรี ไกรตะวุล, พ.บ.*

บทนำ : ภาวะประสาทหูเสียเฉียบพลันเป็นปัญหาที่ถูกยิ่งยกในการรักษาล่าหัวรับแพทย์ คือ จะมี หั้นในแต่การวินิจฉัยโรคและการรักษา เนื่องจากยังไม่มีค่าจำากัดความที่เป็นสาภัค ประกอบกับความรู้ในด้านพยาธิกำาเนิดของโรคยังไม่มีมากพอเพียงที่จะสรุปได้ วิธีการประเมินผลการรักษายังไม่เป็นที่ตกลงแม่ชัด ร่วมกับภาวะนี้มีโอกาสหายเองได้ค่อนข้างสูง ทำให้การศึกษาเกี่ยวกับภาวะนี้กระทำได้ยาก

วัตถุประสงค์ : เพื่อศึกษาถึงลักษณะทางคลินิก และปัจจัยที่มีผลต่อการพยากรณ์โรค

ผู้ป่วยและวิธีการศึกษา : การศึกษานี้เป็นการศึกษาเชิงพรรณนาในผู้ป่วยที่มีภาวะประสาทหูเสียเฉียบพลัน ชนิดที่ไม่ทราบสาเหตุที่รับเข้ารักษาในโรงพยาบาลศรีนครินทร์ จังหวัดขอนแก่น ระหว่างเดือนมกราคม 2537-ธันวาคม 2541 ทุกราย โดยศึกษาถึงลักษณะอาการและอาการแสดงทางคลินิก ผลของการตรวจการได้ยิน และการตรวจการลึบคัน โรคเพิ่มเติม

ผลการศึกษา : พบร่วมผู้ป่วยทั้งสิ้น 56 ราย เป็นเพศหญิง 34 ราย เพศชาย 22 ราย อายุเฉลี่ยขณะเกิดอาการ 43.7 ปี (ค่าเบี่ยงเบนมาตรฐาน = 13.46, พิสัยอายุ 13-66 ปี) ลักษณะของการเกิดอาการภาวะประสาทหูเสียเฉียบพลันพบว่า ผู้ป่วยมีอาการหูอื้อเฉียบพลันร้อยละ 50 ผู้ป่วยที่ลังเกดอาการได้เมื่อตั้งแต่เดือนตุลาคมถึงธันวาคม 46.4 และผู้ป่วยที่หล่อพบร่วมอาการหูอื้อเพียงเล็กน้อยในตอนแรก และอาการหูอื้อเพิ่มมากขึ้นเรื่อยๆ อย่างรวดเร็วในระยะเวลาอันลั้น ผู้ป่วยร้อยละ 92.9 มีอาการในทุกขั้นเดียว ผู้ป่วยร้อยละ 96.4 มีอาการเสียงดังในหูร่วมด้วย และผู้ป่วยที่มีอาการวิงเวียนศีรษะบ้านหมุนร่วมด้วยพบร้อยละ 66.1 ผู้ป่วยร้อยละ 64.3 มีการได้ยินดีขึ้น โดยพบร่วมอาการได้ยินดีขึ้นเป็นปกติพบร้อยละ 28.6 และการได้ยินดีขึ้นบางส่วนพบร้อยละ 35.7 ปัจจัยที่มีผลต่อการพยากรณ์โรคพบว่ามีเพียงระดับของการสูญเสียการได้ยินเท่านั้นที่มีผลต่อการพยากรณ์โรคอย่างมีนัยสำคัญทางสถิติ

สรุป : ประมาณสองในสามของผู้ป่วยที่มีภาวะประสาทหูเสียเฉียบพลัน มีการได้ยินดีขึ้น และพบว่ามีเพียงระดับของการสูญเสียการได้ยินที่มีผลต่อการพยากรณ์โรค

คำสำคัญ : ประสาทหูเสียเฉียบพลัน, ชนิดไม่ทราบสาเหตุ, การพยากรณ์โรค

ขวัญชานก อิมแท้, สุภาภรณ์ ศรีรัมโพธิ์ทอง, สุรี ไกรตะวุล
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* ภาควิชาโสต คือ นาสิก และลาริจซีวิทยา, คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น, ขอนแก่น 40002