



ORIGINAL RESEARCH

IDIOPATHIC SUDDEN SENSORINEURAL HEARING LOSS

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ABSTRACT

Objective: The purpose of this study is to present our patients with ISSHL and to assess the shape of the audiogram and the recovery incidence of the patients.

Methods: 28 patients who were referred to our clinic under diagnosis as idiopathic sudden sensorineural hearing loss during two years (between 2004 - 2006) were included in the study. Routine audiological evaluation was performed to all patients. Shape of initial audiograms was classified in 3 groups: (1) flat audiogram; (2) upsloping audiogram; (3) downsloping audiogram. Differences in PTA and WDS between pre and post-treatment were calculated to assess the recovery of hearing.

Results: In this study, recovery rate was high in each of the three groups. There was no difference in the recovery rate between the groups. There was no relation between recovery and early referral to therapy. The groups were very small for statistical analysis.

Conclusion: It is necessary to enlarge the study group to compare the effects of the factors on idiopathic sudden sensorineural hearing loss.

Keywords: Idiopathic sudden hearing loss, sudden hearing loss, sensori-neural

İDİOPATİK ANİ SENSORİNÖRAL İŞİTME KAYBI

ÖZET

Amaç: Bu çalışmanın amacı idiopatik ani sensorinöral işitme kayıplı hastalarımızı sunmak ve bu hastaların odyogram şekillerini, iyileşme oranlarını değerlendirmektir.

Metot: 2004-2006 yılları arasında idiopatik ani sensorinöral işitme kaybı tanısı alan hastalar çalışmaya alındı. Bütün hastalara rutin odyolojik değerlendirmeler yapıldı. İlk başvurudaki odyogram şekilleri (1) düz odyogram, (2) yüksek frekanslara doğru eğimli odyogram ve (3) alçak frekanslara doğru eğimli odyogram olmak üzere sınıflandırıldı. İşitmedeki düzelmeyi değerlendirmek için tedavi öncesi ve sonrasında saptanan saf ses eşikleri ve ayırdetme puanları arasındaki farklılıklar hesaplandı.

Sonuçlar: Bu çalışmada bütün gruplarda iyileşme oranı yüksek bulundu. Gruplar arasında iyileşme oranı açısından farklılık görülmedi. İyileşme ile tedaviye erken başlama olgusu arasında bir ilişki saptanmadı. İstatistiksel analizler için gruplardaki hasta sayıları yetersiz bulundu.

Tartışma: İdiopatik ani sensorinöral işitme kaybına ilişkin özellikleri ve etken faktörleri ortaya koyabilmek için, çalışmanın sürdürülmesine karar verildi.

Anahtar Kelimeler: İdiopatik ani işitme kaybı, ani işitme kaybı, sensorinöral

INTRODUCTION

Idiopathic sudden sensorineural hearing loss (ISSHL) is characterized by sudden hearing impairment up to deafness within a short period of time and is possibly associated with vestibular dysfunction, tinnitus and pressure sensation in the affected ear. In a majority of cases, ISSHL is unilateral¹. There is no universal consent on the standard definition of sudden sensorineural hearing loss. The term sudden hearing loss is

generally used to refer to hearing losses of sensorineural origin, which have evolved over a period of a few days². Sudden hearing loss is known to be causally related to viral infection, circulatory disturbance in the area of the anterior inferior cerebellar artery, acoustic tumor and perilymphatic fistula and so on^{3,4}. As there is no single known etiology for sudden hearing loss, the treatment of this disease is largely empirical and involves a wide variety of therapies⁵.

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Marmara Medical Journal 2006;19(3);127-131



Clinically, sudden sensorineural hearing loss has been seen in association with other autoimmune diseases such as rheumatoid arthritis, inflammatory bowel disease, and polyarteritis nodosa. The improvement in hearing after corticosteroid and immunosuppressive therapy, as well as plasmapheresis, further suggests an autoimmune response as the cause of hearing loss in these conditions⁶.

Spontaneous complete hearing recovery is reported in The literature 7-10. The likelihood of recovery is influenced by the shape of the audiogram, the age of the patient, and the presence or absence of vertigo².

The purpose of this paper is to present patients with ISSHL and to assess the shape of the audiogram and the recovery incidence of the patients.

METHODS

Subjects:

Twenty-eight patients who were referred to our clinic diagnosed as having ISSHL for two years (between 2004 - 2006) were included in the study. Biochemical blood analyses, serological tests and MRI had been performed for all patients before they were referred to our clinic. There was no clearly defined cause for hearing loss in these cases.

The age of the patients ranged between 7 and 69 years old. Mean age was 46 years. 19 Patients were female and 9 patients were male.

The inclusion criteria were as follows: (1) sudden hearing loss with a history not exceeding 10 days; (2) sensorineural hearing loss for at least three contiguous frequencies, averaging 30 dB or more compared with that for normal hearing.

The interval between onset and initiation of therapy ranged from 22 hours to eleven days.

All patients had tinnitus at the beginning of the hearing loss. None of them complained of vertigo. Two patients' hearing losses were bilateral; so 30 ears of 28 patients were included in the study. 13 of them were left ears and 17 ears were right.

The degree of hearing loss ranged from mild to profound at the first audiological evaluation.

Routine audiological evaluation was carried out in standard soundproof booths (Industrial Acoustic Company), using Interacoustics AZ 7

immittance meter and Interacoustics AC 40 audiometer.

Tympanometry was performed on all patients to verify the pure sensorineural hearing loss. Tympanograms were accepted as normal, when middle ear pressure was ≥ 75 mm H₂O.

Air- and bone-conducted pure tone audiometry was performed in the range of 250 Hz to 8000 Hz and 500 Hz to 4000 Hz respectively. Speech tests included speech reception thresholds and monosyllabic speech discrimination tests. Marmara University Monosyllabic Word Lists in Turkish were used for evaluating the speech discrimination.

The shape of initial audiograms was classified in 3 groups: (1) flat audiogram; (2) upsloping audiogram; (3) downsloping audiogram.

Eighteen of the patients had flat audiogram, 7 had upsloping and 3 had downsloping audiogram. 2 patients with flat audiogram had bilateral hearing loss. Characteristics of the patients are shown in Table I.

Table 1: Characteristics of the patients.

Patients	Age	Gender	Affected Ear	PTA (dB)	SRT (dB)	WDS (%)	Audiogram type
1. NK	67	F	L	110	120	0	Flat
2. AY	46	M	L	73	75	20	Flat
3. BA	13	M	L	80	80	0	Flat
4. SO	52	F	L	85	90	12	Flat
5. SÖ	62	F	L	120	120	0	Flat
6. AÖ	75	F	L	97	95	0	Flat
7. ÖÜ	54	M	L	102	95	0	Flat
8. ŞD	45	F	R	62	40	76	Flat
9. MM	58	F	R	90	95	12	Flat
10. ŞG	51	F	R	120	120	0	Flat
11. EA	23	M	R	120	120	0	Flat
12. GY	63	F	R	120	120	0	Flat
13. HY	63	F	R	68	65	36	Flat
14. PA	60	F	R	43	35	92	Flat
15. KA	57	F	R	68	60	24	Flat
16. ÖE	7	M	L	112	105	0	Flat
17. ÖE	7	M	R	118	100	0	Flat
18. FS	8	M	L	112	105	0	Flat
19. FS	8	M	R	102	100	0	Flat
20. AY	42	M	R	120	120	0	Flat
21. AŞ	60	M	L	45	45	60	Upsloping
22. MÖ	57	F	L	33	40	72	Upsloping
23. SK	17	F	R	15	10	100	Upsloping
24. NE	48	F	R	55	50	12	Upsloping
25. FD	66	F	R	28	25	64	Upsloping
26. SB	42	F	R	45	30	36	Upsloping
27. ÖA	16	F	R	47	55	36	Upsloping
28. AC	69	M	L	57	60	40	Downsloping
29. FE	38	F	L	55	50	88	Downsloping
30. AY	22	F	R	42	40	88	Downsloping



The assessment of hearing recovery was made on the basis of the patient's impression and audiological criteria. Audiological improvement was defined as a 10 dB decrease at least in pure-tone average (PTA) or 16% improvement at least in word discrimination score (WDS). PTA was calculated from 0.5, 1, 2 and 4 kHz.

The same therapeutic protocol (corticosteroid) was applied by Marmara University Otorhinolaryngology Department for all patients.

RESULTS

Differences in PTA and WDS between pre and post-treatment were calculated. These data are shown in Table II.

Ten of 20 ears of the patients with flat audiogram showed improvement in PTA and 6 of them in WDS (Figure 1). There were positive changes in PTA for one ear, but they were not enough to accept as improvement, whereas SRT had an improvement of 20 dB. Furthermore one ear had an improvement of 35 dB in PTA, but speech tests showed no changes (Table 2).

Five patients with upsloping audiogram showed improvement in PTA whereas one of them had an insignificant improvement and one of them showed no change. Although one patient had improvement of 12 dB in PTA, deterioration was observed in SRT, but no change was found for WDS (Figure 2).

Table 2: Changes in PTA, SRT and WDS between Pre and Post-Treatment

Patients	Affected Ear	Changes in PTA (dB)	Changes in SRT (dB)	Changes in WDS (%)	Audiogram type
1. NK	L	10	20	0	Flat
2. AY	L	3	0	16	Flat
3. BA	L	15	20	0	Flat
4. SO	L	62	65	76	Flat
5. SÖ	L	0	0	0	Flat
6. AÖ	L	9	5	0	Flat
7. OÜ	L	2	-5	0	Flat
8. ŞB	R	57	35	24	Flat
9. MM	R	78	80	88	Flat
10. ŞG	R	38	40	0	Flat
11. EA	R	12	20	0	Flat
12. GY	R	35	0	0	Flat
13. HY	R	32	35	52	Flat
14. PA	R	30	20	0	Flat
15. KA	R	-2	0	20	Flat
16. ÖE	L	-5	5	0	Flat
17. ÖE	R	9	15	0	Flat
18. FS	L	-5	5	0	Flat
19. FS	R	7	20	0	Flat
20. AY	R	0	0	0	Flat
21. AŞ	L	27	25	32	Upsloping
22. MÖ	L	10	20	16	Upsloping
23. SK	R	12	-5	0	Upsloping
24. NE	R	52	45	72	Upsloping
25. FD	R	0	0	4	Upsloping
26. SB	R	5	0	24	Upsloping
27. ÖA	R	44	40	56	Upsloping
28. AC	L	10	15	36	Downsloping
29. FE	L	48	40	12	Downsloping
30. AY	R	9	10	4	Downsloping

Improvement in PTA and WDS was observed in two patients with downsloping audiogram while there was no difference in the other patient (Figure 3).

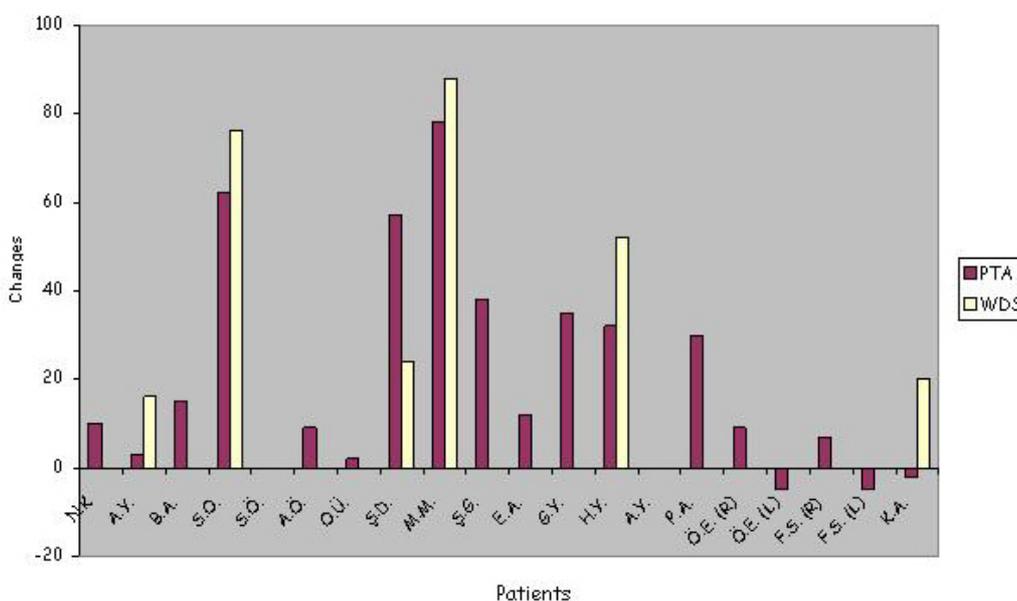


Figure 1: Changes in PTA and WDS in Patients with Flat Audiogram

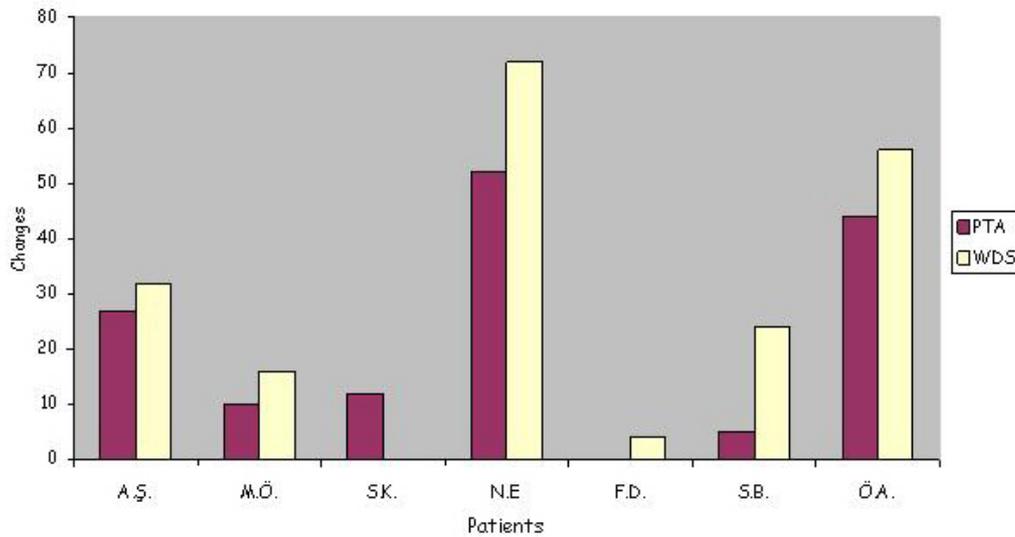


Figure 2: Changes in PTA and WDS in Patients with Upsloping Audiogram

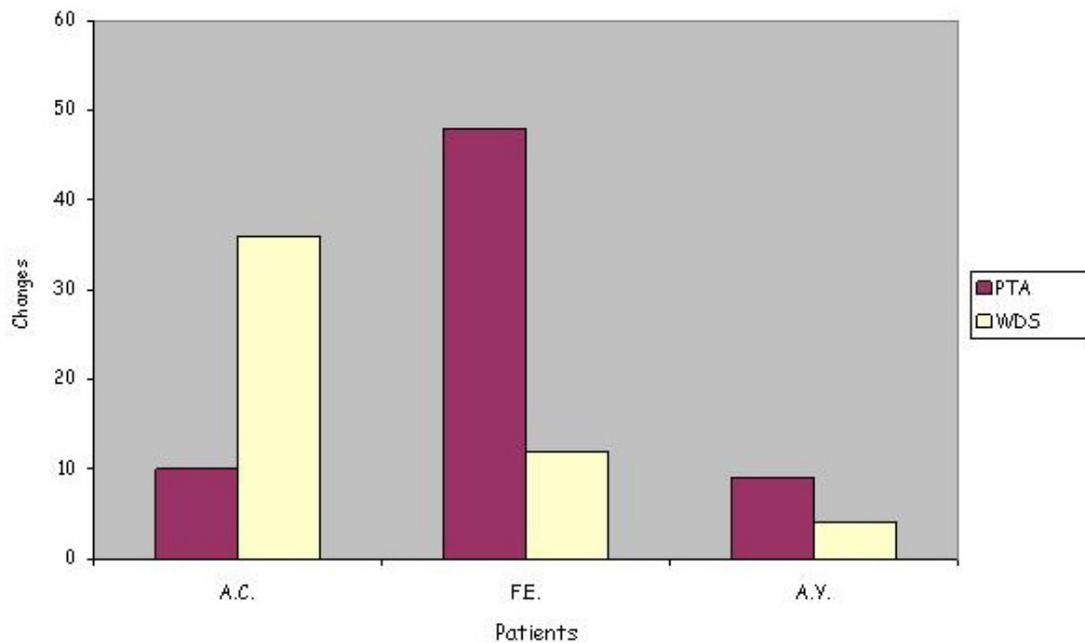


Figure 3: Changes in PTA and WDS in Patients with Downsloping Audiogram

DISCUSSION

In this study, the recovery rate was high in each of the three groups. There was no difference in the recovery rate between the groups. Mattox and Simmons reported that recovery was influenced by the shape of the audiogram⁹. This finding was not compatible with our study. However, it is necessary to emphasize that the number of subjects in the downsloping and the upsloping groups was very small. Therefore, statistical analysis of the data was not possible. In the literature, vertigo has been accepted as one of the poor prognostic indicators^{9,12}. There was no

patient with vertigo in this study. The high recovery rate could be explained by this factor.

There were slightly more females than males in this study, unlike to the equal gender distribution in literature^{11,13}.

Some studies reported that the duration between onset of the hearing loss and referral to therapy was essential¹⁴⁻¹⁶. We did not observe this relationship. Our observation is compatible with Huy and Sauvaget's findings¹⁷. Hearing recovery was obtained in the patient referred 11 days after the onset of hearing loss, whereas there was no



improvement in the patient referred on the same day of the onset of hearing loss.

In the data analysis stage, we concluded that our findings can give an idea about ISSHL, but it is necessary to enlarge the study group in order to compare the effects of the factors on ISSHL.

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