

돌발성 난청 환자의 예후 인자에 대한 분석

가

조창현 · 한규철 · 차홍억 · 우주현

Analysis of Prognostic Factors in Patients with Sudden Sensorineural Hearing Loss

Chang Hyun Cho, MD, Gyu Chul Han, MD, Heung Eog Cha, MD and Joo Hyun Woo, MD

Department of Otolaryngology-Head & Neck Surgery, Gil Medical Center, Gachon Medical School, Incheon, Korea

-ABSTRACT -

Background and Objective : Idiopathic sudden sensorineural hearing loss (ISSNHL) can be defined as hearing levels poorer than 30 dB at least three continuous audiometric frequencies occurring within 3 days or less. The pathophysiologic mechanism and specific treatment regimen of this disease are unclear. The purpose of this study is to identify the contributing effect of each prognostic factor by analysis of hearing improvement after treatment. **Materials and Method** : Retrospective chart review was performed in 224 patients with ISSNHL admitted in from November 1997 to April 2003. **Result** : Overall recovery rate was 52.2%. Initial hearing level, vertigo and age was closely related with prognosis of hearing. The prognosis according to audiogram was better in the usual order following up-slope, U-shape, flat and down-slope against profound shape. The beginning of treatment was related with only whether improvement is present. The erythrocyte sedimentation rates (ESR) were related with only degree of hearing recovery. Other factors such as presence of whirling vertigo or non-whirling vertigo, accompanying symptoms, preexisting systemic disease, abnormal thyroid function test and speech discrimination score were not related with prognosis. **Conclusion** : To predict prognosis of ISSNHL, investigators should considerate both whether improvement is present and how is degree of recovery. Initial hearing level, vertigo, audiogram and age were direct predictors of prognosis in patients with ISSNHL. Beginning of treatment and ESR were relatively considerable prognostic factors. (J Clinical Otolaryngol 2005; 16:89-95)

KEY WORDS : Sudden hearing loss · Prognosis.

서 론

가

1)2)

가

: 2005 4 1

: 2005 5 10

: , 405 - 760

1198 가

: (032) 460 - 3324 · : (032) 467 - 9044

E - mail : Chochmd@ghil.com

3)4)

가 10,000 IU

청력 검사

대상 및 방법

대상

1997 11 2003 4 가

224

30 dB

5)

가 103 , 가 121 44.7

105 , 119

예후 인자

청력 회복의 판정 및 청력도의 분류

Sigel⁷⁾ (Table 1)

5~13

hepa-

rin, Dextran 1000 ml

predni- 20 dB

solone Wilson⁶⁾ 20 dB

45 kg 가 15 dB

, 30~45 kg 2/3 20 dB U-

. Heparin 10,000 IU 10 ml 가 91 dB

Table 1. The Siegel's criteria of hearing recovery

Type	Hearing recovery
I. Complete recovery	Patients whose final hearing level was better than 25 dB regardless of the size of the gain.
II. Partial recovery	Patients who showed more than 15 dB of gain and whose final hearing level was between 25 and 45 dB.
III. Slight recovery	Patients who showed more than 15 dB of gain and whose final hearing level was poorer than 45 dB.
IV. No improvement	Patients who showed less than 15 dB of gain or whose final hearing level was poorer than 75 dB.

통계학적 분석

초기 청력 소실 정도

Fisher's exact test Student's t-test

가 (p=0.016), 가 (p<0.0001).

Fisher's exact test ANOVA

가 (p<0.0001[‡]), 가 (p<0.0001)(Table 2).

Logistic

p = 0.05

현 혼

SAS version 8.2(SAS Institute Inc., USA)

(p=0.005).

결 과

가 (p=0.013)(Table 3).

전체 회복율

224 117 가
52.2% 46 (20.5%),

22 25 (p=0.763), (p=0.076).

Table 2. The analysis of recovery grade according to initial hearing level

	Complete n (%)	Partial n (%)	Slight n (%)	No improve n (%)	p-value
Initial hearing level (dB)	67.37 ± 18.53 [†]	74.16 ± 13.71 [†]	89.44 ± 14.30*	83.13 ± 24.99*	<0.0001 [‡]
Initial hearing level					
26 - 40	4 (8.7)			9 (8.4)	
41 - 55	10 (21.7)	3 (8.1)		11 (10.3)	
56 - 70	11 (23.9)	12 (32.4)	3 (8.8)	10 (9.4)	<0.0001
71 - 90	18 (39.1)	17 (46.0)	15 (44.1)	25 (23.4)	
91 -	3 (6.5)	5 (13.5)	16 (47.1)	52 (48.6)	
Total	46 (100)	37 (100)	34 (100)	107 (100)	

* , † : Duncan's multiple comparison is performed. Same letters are not significantly different with =0.05
‡ : P-value is calculated by ANOVA

Table 3. The analysis of recovery grade according to dizziness

	Complete n (%)	Partial n (%)	Slight n (%)	No improve n (%)	p-value
Dizziness					
Absence	42 (91.3)	33 (89.2)	26 (76.5)	76 (71.0)	0.013
Presence	4 (8.7)	4 (10.8)	8 (23.5)	31 (29.0)	
Total	46 (100)	37 (100)	34 (100)	107 (100)	

Table 4. The analysis of recovery grade according to audiogram

		Complete n (%)	Partial n (%)	Slight n (%)	No improve n (%)	p-value
Audiogram	Up sloping	11 (23.9)	11 (29.7)	4 (11.8)	10 (9.4)	<0.0001
	Flat	17 (37.0)	8 (21.6)	5 (14.7)	21 (19.6)	
	U-shape	5 (10.9)	6 (16.2)	2 (5.9)	4 (3.7)	
	Down sloping	10 (21.7)	7 (18.9)	6 (17.7)	20 (18.7)	
	Profound	3 (6.5)	5 (13.5)	17 (50.0)	52 (48.6)	
Total		46 (100)	37 (100)	34 (100)	107 (100)	

Table 5. The logistic regression of each audiogram's influence for hearing improvement against profound shape

Analysis of Maximum Likelihood Estimates				
Parameter		Estimate	Standard Error	p-value
Audiogram	Up sloping	2.1345	0.5980	0.0004
	U-shape	2.1513	0.7412	0.0037
	Flat	1.3873	0.5090	0.0064
	Down sloping	1.5090	0.5946	0.0111

Table 6. The analysis of recovery grade according to age

		Complete n (%)	Partial n (%)	Slight n (%)	No improve n (%)	p-value
Age (years)		38.35 ± 13.10	45.27 ± 15.35*	49.12 ± 11.65*	46.77 ± 14.24*	0.002‡
Age	1 - 15	2 (4.4)	1 (2.7)		1 (0.9)	0.286
	16 - 60	41 (89.1)	29 (78.4)	27 (79.4)	84 (78.5)	
	More than 61	3 (6.5)	7 (18.9)	7 (20.6)	22 (20.1)	
Age	Less than 40	25 (54.4)	12 (32.4)	8 (23.5)	36 (33.6)	0.024
	More than 40	21 (45.7)	25 (67.6)	26 (76.5)	71 (66.4)	
Total		46 (100)	37 (100)	34 (100)	107 (100)	

* , † : Duncan's multiple comparison is performed. Same letters are not significantly different with $\alpha=0.05$
‡ : P-value is calculated by ANOVA

초기 청력도

가 가 가
(p=0.0001). (p=0.020).
가 가 (p=0.286)
가 (p<0.0001)(Table 4). 40 ,
가 (p=0.002‡)
(Table 6). 40
(p=0.0004), U (p=0.0037), (p=0.0064), 40
(p=0.1111) 40 가
(Table 5). (p=0.024)(Table 6).

나 이

치료 시작 시기

15 60 224 7 가 191

Table 7. The analysis of recovery grade according to beginning of treatment

	Complete n (%)	Partial n (%)	Slight n (%)	No improve n (%)	p-value
Beginning of treatment (day)	3.61 ± 2.73	4.24 ± 2.75	5.50 ± 5.63	5.36 ± 5.04	0.096*
Beginning of treatment					0.215
- 7	43 (93.5)	35 (94.6)	27 (79.4)	86 (80.4)	
8 - 14	2 (4.4)	2 (5.4)	5 (14.7)	15 (14.0)	
after 15	1 (2.2)		2 (5.9)	6 (5.6)	
Total	46 (100)	37 (100)	34 (100)	107 (100)	

* : P-value is calculated by ANOVA

Table 8. The analysis of recovery grade according to the erythrocyte sedimentation rates

	Complete n (%)	Partial n (%)	Slight n (%)	No improve n (%)	p-value
ESR Normal	45 (97.8)	34 (91.9)	27 (79.4)	98 (91.6)	0.040
Elevation	1 (2.2)	3 (8.1)	7 (20.6)	9 (8.4)	
Total	46 (100)	37 (100)	34 (100)	107 (100)	

(85.3%) , (p=0.135),
 가 (p=0.007). (p=0.464).
 (p=0.096*), 당 뇨
 0.215)(Table 7). (p= 30 16
 , 194 101 가
 적혈구 침강 속도 (p=0.154),
 가 (p=0.493).
 가 (p=0.795), 고혈압
 가 (p=0.040)(Table 8). 24 9
 , 200 108
 이충만감 (p=0.054),
 63 36 (p=0.300).
 161 , 81
 (p=0.357), 갑상선 기능 이상
 (p=0.515).
 7
 이 명 , 2 1
 137 77 , 가
 , 87 40 1 T₃가 가 2
 , T₄가 1 .

가 219 115 가

($p=0.300$),
($p=0.781$).

가 -

14-16)

초기 어음명료도

1)17)18) Park 가 18)

($p=0.775$),
($p=0.640$).

가

가

고 찰

가

가

가

가

, U-

가

가

4)6)10)

가

가

, U-

가

가

가

가

가

가

1)8-10)

4)

가 76 8 (10.5%)

Byl 19) 15 60

. Lee 11)

가 가 가 가 가

가 75 35 (46.7%)가 1

Moskowitz 20) 40

, Wilkins 2)

4~7

가

가 가 , 60

가

40

가

가

2)3)8)9)12)13)

1

중심 단어 :

REFERENCES

1) Sheehy JL. Vasodilator therapy in sensorineural hearing loss. *Laryngoscope* 1960;70:885-914.
 2) Wilkins SA Jr, Mattox DE, Lyles A. Evaluation of a "shotgun" regimen for sudden hearing loss. *Otolaryngol Head*

Neck Surg 1987;97:474-80.
 3) Byl FM. Seventy-six case of presumed sudden hearing loss occurring in 1973: Prognosis and incidence. *Laryngoscope* 1977;87:817-25.
 4) Mattox DE, Simmons FB. Natural history of sudden sensorineural hearing loss. *Ann Otol Rhinol Laryngol* 1977;86:463-80.
 5) Wilson WR. Why treat sudden hearing loss. *Am J Otol* 1984;5:481-3.
 6) Wilson WR, Julianna GA. Sudden sensorineural hearing loss. In: Cummings CW, Fredrikson JM, Harker LA, Krause CJ, Schuller DE, editors. *Otolaryngology-Head and Neck Surgery*. 2nd ed. St. Louis: Mosby Year Book;1993. p.3103-12.
 7) Siegel LG. The treatment of idiopathic sudden sensorineural hearing loss. *Otolaryngol Clin North Am* 1975;8:467-73.
 8) Byl FM. Sudden hearing loss: Eight years experience and suggested prognostic table. *Laryngoscope* 1984;94:647-61.
 9) Shikowitz MJ. Sudden sensorineural hearing loss. *Med Clin North Am* 1991;75:1239-50.
 10) Wilson WR, Byl FM, Laird N. The efficacy of steroids in the treatment of idiopathic sudden hearing loss. *Arch Otolaryngol* 1980;106:772-6.
 11) Lee JK, Seo DJ, Cho HH, Cho Y, Kim HJ, Cho YB. A study on the hearing recovery patterns in sudden sensorineural hearing loss patients. *Korea J Otolaryngol* 2002;45:656-61.
 12) Shaia FT, Sheehy JL. Sudden sensorineural hearing impairment: A report of 1220 cases. *Laryngoscope* 1976;96:389-98.
 13) Cinamon U, Bendet E, Kronenberg J. Steroids, carbogen or placebo for sudden hearing loss: A prospective double-blind study. *Eur Arch Otorhinolaryngol* 2001;258:477-80.
 14) Simmons FB. Theory of membrane breaks in sudden hearing loss. *Arch Otolaryngol* 1968;88:41-8.
 15) Nakashima T, Yanagita N. Outcome of sudden deafness with and without vertigo. *Laryngoscope* 1993;103:1145-9.
 16) Axelsson A. The vascular anatomy of the cochlear in the guinea pig and in man. *Acta Otolaryngol (Stockh) Suppl* 1968;243:96-102.
 17) Hong BS, Chung WH, Park KH, Jung YG, Hong SH, Choo KC. Whirling vertigo as a prognostic factor in sudden sensorineural hearing loss. *Korean J Otolaryngol* 2002;45:651-5.
 18) Park HM, Jung SW, Rhee CK. Vestibular diagnosis as prognostic indicator in sudden hearing loss with vertigo. *Acta Otolaryngol Suppl* 2001;545:80-3.
 19) Byl FM. Sudden hearing loss research clinic. *Otolaryngol Clin North Am* 1978;11:71-8.
 20) Moskowitz D, Lee KJ, Smith HW. Steroid use in idiopathic sudden sensorineural hearing loss. *Laryngoscope* 1984;94:664-6.