

고식적 치료에 반응을 보이지 않는 돌발성난청 환자에 대한 고실내 스테로이드 주입술의 효과

정연훈 · 박기현 · 모정윤 · 오정훈 · 김지수

The Effects of Intratympanic Steroid Injection for the Patients with Refractory Sudden Sensorineural Hearing Loss

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ABSTRACT

Background and Objectives : High-dose steroid therapy has been known as the treatment of choice for sudden sensorineural hearing loss (SSNHL). However, about one third of patients do not generally respond to any treatments, and there seem to be no definitive treatment for the patients with refractory SSNHL. We prospectively studied the effect of intratympanic steroid injection (ITSI) for patients with refractory SSNHL. **Subjects and Method** : Sixty six patients with SSNHL, who were refractory to a course of oral steroid therapy, were included in this study. Thirty three patients (34 ears) were treated with ITSI and the other 33 patients had no further treatments as control. ITSI was performed with dexamethasone in the supine position on 4 separate occasions over the course of 2 weeks. Hearing was assessed immediately before every injection, and at 1 and 4 weeks after therapy. Hearing improvement was defined as more than 10 dB in pure tone average (PTA). **Results** : Hearing improvement was observed in 13 (39.4%) of 33 patients who underwent ITSI and in 2 (6.1%) of 33 patients in control group. Five of 13 showed hearing improvement over 20 dB in PTA, and 11 of 20 patients showed no improvement in PTA by ITSI, but showed improvement over 10dB in some frequencies. There were no definite prognostic factors between the patients who responded to ITSI and those who didn't. **Conclusion** : ITSI is a simple and effective therapy for patients with refractory SSNHL. (Korean J Otolaryngol 2005;48:706-12)

KEY WORDS : Sudden deafness · Steroids · Tympanum · Injection.

가
100,000 5~20
1)2) 가
가
가 3)4) 1)7) 2 가
가
: 2004 10 11 / : 2005 2 15 가 30~50%
: , 442 - 791 5
: (031) 219 - 5263 · : (031) 219 - 5264 1)5)6)
E - mail : yhc@ajou.ac.kr

가

8) Dexamethasone(Dexamethasone®, 5 mg/ml,) 0.3~0.4 cc

45 가 40

9) Parnes 10) 13 4 가 2

38~72% 가 가

11-13) 가 1, 4 가 가

4 4 8

14)15) 가 8 가

가 500, 1000, 2000, 3000 Hz

가 10 dB

2000 3 2004 1 가 15%

1 Siegel's criteria

66 가

33 (34) 가

(), 33 가

().

66 10 independent t - test, paired

t - test, chi - square test , p 0.05

가

Solondo®(Prednisolone, ()) 60 mg/d 5 , 40 mg/d 2 , 20 mg/d 2 , 10 mg/d 1 10 , Tana-min®(Ginkgo biloba Ext., ())

Vacrax®(Acyclovir, ()) 66

Dichlozid(Hydrochlorothiazide, ()) 33 (34) 39.3 , 42.8 .

13 : 20, 14 : 19 , 5.2 , 6.5 , 72.0 dB, 76.5 dB .

(p=0.096), (p=0.977), (p=0.831) (p=0.221)

25 - ga- uge 1 cc (Table 1).

Table 1. Comparison of the characteristics between the patients treated with intratympanic steroid injection (ITSI) and control group

	ITSI group*	Control group	P value
Number	33 (34 ears)	33	
Age (years)	39.3	42.8	0.096
Sex (M : F)	13 : 20	14 : 19	0.977
Duration from onset to Tx (days)	5.2	6.5	0.831
PTA (dB)	72.0	76.5	0.221

*patients who were treated with a course of ITSI therapy, M : male, F : female, Tx : treatment, PTA : pure tone averages

Table 2. Hearing improvement in the patients treated with intratympanic steroid injection (ITSI) according to the response at initial treatment including oral steroids

	>20 dB HG	20 - 10 dB HG	No gain
Partial response* (n=16)	1 (6.3%)	6 (37.5%)	9 (56.3%)
No response (n=18)	4 (22.2%)	2 (11.1%)	12 (66.7%)

*patients who showed hearing improvement of more than 10 dB at initial treatment including oral steroids, were treated with a course of ITSI therapy, HG : hearing gain

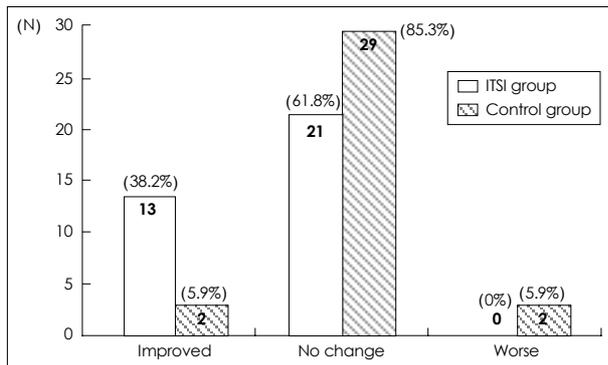


Fig. 1. Comparison of hearing improvement* between intratympanic steroid injection group and control group. *hearing improvement : over than 10 dB in pure tone average (0.5, 1, 2, 3 KHz), ITSI : intratympanic steroid injection.

가 10 dB, 34 13

38.2%(33 13 - 39.4%), 21
가 , 가 2
6.1% , 29 (87.8%) 가 , 2 (6.1%)
(Fig. 1).

가
72.0 dB, 4 가 62.9 dB
9.1 dB (p=0.001) , (33.3%)
가 24% 36.1%

((p=0.121)

가

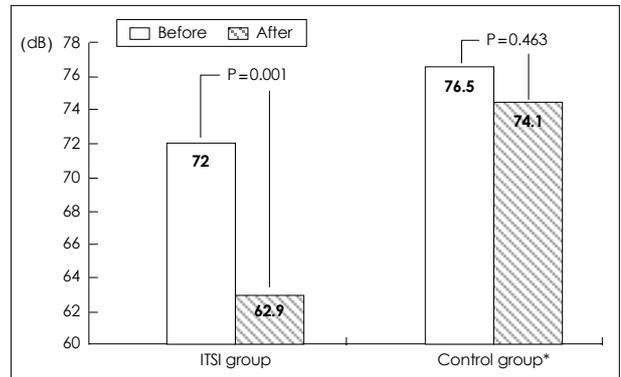


Fig. 2. Comparison of hearing gain in PTA between intratympanic steroid injection group and control group. *comparison between PTA at 4 weeks and 8 weeks after onset of sudden sensorineural hearing loss (same interval to PTA follow up in the ITSI group), PTA : pure tone average, Before : PTA before ITSI therapy, After : PTA at 4 weeks after ITSI therapy.

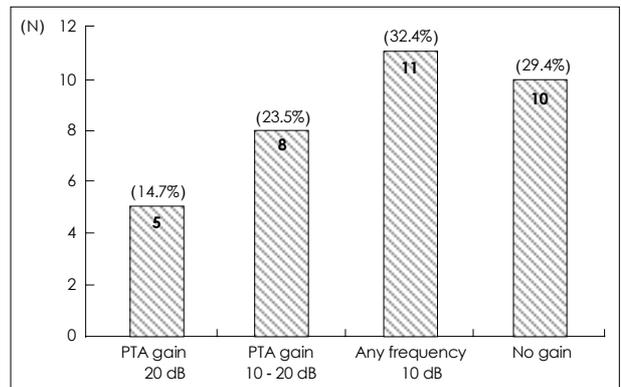


Fig. 3. Hearing gain in intratympanic steroid injection group (34 ears). PTA : pure tone average (mean of 0.5, 1, 2, 3 KHz).

가 4 () 76.5 dB, 4
74.1 dB 2.4 dB 가
가 (p=0.463)(Fig. 2).

, 20 dB
5 , 10~20 dB 8 ,
10 dB
가 11 (Fig. 3).

10 dB 가
(16) (18)

Table 2 .
7 (43.8%) , 6
(p=0.127).

Table 3

Table 3. Hearing improvement in the patients treated with intratympanic steroid injection (ITSI) according to pure tone averages (PTA) before ITSI

	>20 dB HG	20 - 10 dB HG	No gain
26 - 40 dB (n=2)			2
41 - 55 dB (n=10)	2	1	7
56 - 70 dB (n=3)			3
71 - 90 dB (n=11)	1	6	4
90 - 110 dB (n=8)	2	1	5

HG : hearing gain

Table 4. Comparison of two groups according to responsiveness of intratympanic steroid injection

	Responsive group	Non-responsive group	P value
Number	13	21	
Age (years)	41.5	37.7	0.501
Sex (M : F)	2 : 10	10 : 11	
Duration from onset to initial Tx (days)	6.5	4.67	0.367
Duration from onset to ITSI (days)	31.8	35.1	0.391
Initial PTA (dB)	90.6	82.1	0.305
PTA before ITSI (dB)	77.6	67.0	0.201
Hearing improvement of initial Tx (systemic steroid)	8/13 (61.5%)	9/21 (42.8%)	0.291
Audiogram type (n)	Ascend (3), descend (3), flat (6)	Ascend (6), descend (7), flat (8)	
Presence of vertigo	7/12 (58.4%)	7/21 (33.3%)	0.273

Responsive group ; patients who showed hearing improvement over than 10 dB in pure tone average with intratympanic steroid injection (ITSI) therapy. Non-responsive group ; patients who showed no hearing improvement with ITSI therapy. M : male, F : female, PTA : pure tone average, Tx : treatment, n : number

10 dB 가 (0.25, 0.5, 1 KHz) 34 17 (50.0%), (2, 3 KHz) 12 (35.3%), (4, 6, 8 KHz) 13 (38.2%) , 가 (Fig. 4).

1 가 12 (35.3%), 2 가 5 (14.7%), 3 가 4 (11.8%), 4 가 7 (20.6%) 2.2

가 10 dB 13 가 3 가 20 3 가 10 , 가

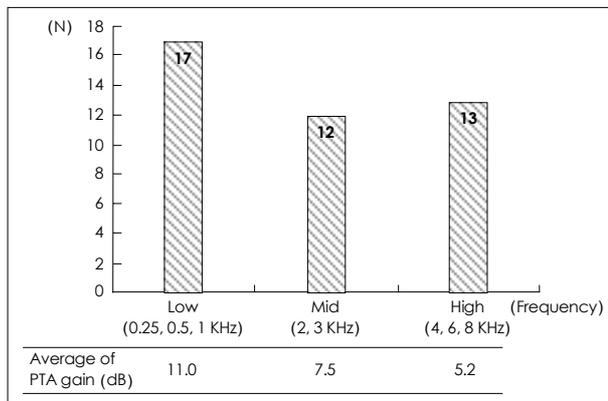


Fig. 4. Hearing gain* in different frequencies in intratympanic steroid injection group (34 ears). *hearing gain : over than 10 dB in pure tone average (0.5, 1, 2, 3 KHz).

가 3 31 3 13 () 20 () 41.5 , 37.7 , 2 : 10, 10 : 11 , 6.5 , 4.7 , 31.8 , 35.1 가 90.6 dB, 82.1 dB 77.6 dB, 67.0 dB 가 (61.5%), 가 13 8 (42.8%) 가 (Table 4).

돌발성난청 환자에 대한 고실내 스테로이드 주입술의 효과

가

3)4)

8)

4.2~17.2%

2.8%

2)13)

가

1)6)7)16) 1977 Mattox 6) 28

20 (71%)

88 63 (72%)

1980 Wilson 1) 10)

34 11 (32%)

33 20 (61%)

hydrocortisone, methylprednisolone, dex-

xamethasone 가

Chandrasekhar¹¹⁾ dexamethasone histamine

가 dexamethasone

thasone 가

Parnes 10) methylprednisolone

methylprednisolone hydrocor-

tisone

dexamethasone

가

1~2 DNA

17) type (glucocorticoid) type 가

(mineralocorticoid) 가

17) glucocorti- Panes 10) 13 53%

coid 가 Chandraseckhar 11) 11 8 (72.7%)

가 Park 13) 32 65.6%

가 cytokine 가 Silverstein 12)

Glucocorticoid 38%

53~72%

가

(). glu-

cocorticoid Na,K - ATPase type

18) Na, Gianoli 14) 23

K - ATPase 83% 가 Kopke 15) 9

18)

가

가

19) cyclic adenosine 3', 5' - monophosphate

가

14)20)

4, (, ,)

2 가

가 (reversibility) 가

가 가 . , (

34 13 (38.2%) 가)

(6.6%) 가 33 2 가 .

Gianoli ¹⁴⁾ . Kopke ¹⁵⁾ 가 .

가 . Kopke , 40 가 .

가 . Kopke ¹⁵⁾ .

micropump 14 , Gianoli

가 (Table 2) , ¹⁴⁾ Park ¹³⁾ 10~14 4 .

14 4

(Table 3) 가 .

가 1 가 12 , 2 가 5 , 3 가

4 , 4 가 7

4 가

(0.5, 1, 2, 3 K) .

10 dB 20 ,

10 dB 가 10 (50.0%)

가 . ¹¹⁾¹³⁾¹⁴⁾ 3

20 , 3 가 3 , 10 .

가 .

calori

가 .

9.1 dB , 2.4 dB 가 가 .

가 가 .

가 .

17

8 (47.1%)

13 8 (61.5%)

42.8%

50.0% (

11.0 dB) , 34~38%(5.2~ , , ,

7.5 dB) .

가

4

4

15)

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