

돌발성 난청에서의 저출력 레이저와 Ginkgo-Extract의 병용요법에 의한 청력개선

박기현 · 박홍준 · 정연훈 · 김병철

Hearing Improvement by a Combined Therapy of Low Power Laser and Ginkgo-Extract on Sudden Deafness

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ABSTRACT

Sudden deafness is a rapidly progressive, partial or complete, typically unilateral sensorineural hearing impairment, which is frequently encountered with no known specific etiology in clinical practice. Many treatment protocols for this disease have been introduced until now, however they did not make us satisfied. Recently, a new combined therapy of low power laser and ginkgo - extract has been introduced, which rationale is reactivation of decreased cell metabolism by stabilizing vascular wall, washing out toxic materials from blood and gene activation. The purpose of this study is to analyse clinical result of this trial by comparing with that of anticoagulant therapy and to provide the basic data for application of this therapy as a new treatment modality on sudden deafness. In this study, 51 patients were treated with laser and ginkgo - extract therapy, and 37 patients were treated with anticoagulant therapy as control. Both groups were combined with steroid therapy. Treatment with this trial had as a good result as anticoagulant therapy, and it was more comfortable to patients without side reactions. (2(1):81-86, 1998)

KEY WORDS : Sudden deafness · Low power laser · Ginkgo - extract · Heparin.

서 론

가 3

30 dB

1)

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가

Ginkgo - Extract

Wilson ¹⁾ Moskowitz ²⁾ ,
 , Shea ³⁾ hypa -
 que , Fisch ⁴⁾ 가 . 1
 5% CO₂ 95% O₂(carbogen) 95 7 97 6 2
 가 . prostaglandin E, 51 Witt⁸⁾ Park ⁹⁾
 stellate ganglion block, urograffin tanamin(ginkgo - extract) 80 mg 3
 Heparin Bolognesi⁵⁾가 15 12 mW laser(Felas Laser
 , Takayuki ⁶⁾ HN12 Combi, Germany) 1300 Hz
 100 Hz 가 15 1300 1800
 , Hz, 2300 2800 Hz(2800 Hz 4) 15
 viremia defibrinogenation 가
 steroid 가 , 4 cm(가 2)
 , Kallinen ⁷⁾ heparin . 2 94
 가 6 95 6 1 3
 가 heparin 10,000 unit bolus
 , 10,000 unit 9
 1970 가 가 . 10
 Witt⁸⁾ , prednisolone 60 mg/d 5 , 40 mg/d
 , 20 mg/d 2 , 10mg/d 1
 (gene
 activation) ,
 ginkgo biloba 가 ,
 . 500 Hz, 1000
 Hz 2000 Hz Seigel ¹⁰⁾
 : 25 dB
 heparin , : 15 dB
 25 45 dB ,
 : 15 dB
 45 dB , : 15
 dB 75 dB
 . Pearson Chi - square test t - test

연구대상 및 방법

1994 6 1996 6 3

결 과

88 가 40 , 가 , laser ginkgo - extract 1 40.5
 48 , 39.8 (13 66) . , 7.5 , heparin 2 39.0 ,
 , , , 6.4 (Table 1).

1 77.9 dB, 2 70.9 dB (Table 1), , , , , 가 1 15 (29.4%), 10 (19.6%), 1 2, 4, 15, 19, 11 (51 7 (13.7%), 19 (37.3%) , 2) , 2 4, 7, 8, 12, 6 (37 13 (35.1%), 7 (18.9%), 6 (16.2%), 11 (29.7%)) (Table 2 - 1, 2 - 2).

Table 1. Comparison of variables between two groups

	Mean of group 1*	Mean of group 2**	p value (t-test)
Age(years)	40.5	39.0	0.610
Time to Tx.(days)	7.5	6.4	0.495
Initial H.L.(dB)	77.9	70.9	0.118
Patient(cases)	51	37	

*Group 1 : patients who were treated with a combined therapy of low power laser and ginkgo-extract

**Group 2 : patients who were treated with heparin therapy

Tx : treatment H.L. : hearing loss

7 가 1 31 , 2 32 가 , 8 14 1 13 , 2 2 . 7 1 31 11 (35.5 %), 2 32 13 (40.6%)가 , 7 - 1 31 22 (71%), 2 32 25 (78.1%) (Table 3 - 1, 3 - 2).

(hearing gain) , laser ginkgo -

Table 2-1. Recovery rates according to initial hearing loss in group 1

Hearing loss	Complete*(%)	Partial**(%)	Slight***(%)	No.****(%)	Total
Mild	2(100.0)				2
Moderate	1(25.0)	1(25.0)		2(50.0)	4
Moderate-severe	6(40.0)	5(33.3)		4(26.1)	15
Severe	6(31.6)	4(21.1)	3(15.8)	6(31.6)	19
Profound			4(36.4)	7(63.6)	11
Total(%)	15(29.4)	10(19.6)	6(13.7)	19(37.3)	51

Pearson Chi-square p = 0.038

Table 2-2. Recovery rates according to initial hearing loss in group 2

Hearing loss	Complete*(%)	Partial**(%)	Slight***(%)	No.****(%)	Total
Mild	3(75.0)			1(25.0)	4
Moderate	3(42.9)	2(28.6)		2(29.6)	7
Moderate-severe	2(25.0)	3(37.5)	1(12.5)	2(25.0)	8
Severe	5(41.7)	2(16.7)	3(25.0)	2(16.7)	12
Profound			2(33.3)	4(66.7)	6
Total(%)	13(35.1)	7(18.9)	6(16.2)	11(29.7)	37

Pearson Chi-square p = 0.231

*Complete recovery group : patients whose final hearing level was better than 25 decibels regardless of the size of gain

**Partial recovery group : patients who showed more than 15 decibels of gain whose final hearing level was between 25 and 45 decibels.

***Slight recovery group : patients who showed more than 15 decibels of gain whose final hearing level was poorer than 45 decibels

****No improvement group : patients who showed less than 15 decibels of gain

Ginkgo - Extract

Table 3-1. Recovery rates according to duration in group 1

Duration(day)	Complete(%)	Partial(%)	Slight(%)	No. (%)	Total
Under 7	11(35.5)	6(19.4)	5(16.1)	9(29.0)	31(60.8)
8 - 14	3(23.1)	3(23.1)	1(7.7)	6(46.2)	13(25.5)
15 - 28	1(16.7)	1(16.7)		4(66.6)	6(11.7)
Over 28			1(100.0)		1(2.0)
Total	15(29.4)	10(19.6)	7(13.7)	19(37.3)	51(100.0)

Pearson Chi-square p = 0.288

Table 3-2. Recovery rates according to duration in group 2

Duration(day)	Complete(%)	Partial(%)	Slight(%)	No. (%)	Total
Under 7	13(40.6)	7(21.9)	5(15.6)	7(21.9)	32(86.5)
8 - 14				2(100.0)	2(5.4)
15 - 28			1(100.0)		1(2.7)
Over 28				2(100.0)	2(5.4)
Total	13(35.1)	7(18.9)	6(16.2)	11(29.7)	37(100.0)

Pearson Chi-square p = 0.073

Table 4. Comparison of hearing improvement between two groups

	Mean of group 1	Mean of group 2	p value (t-test)
Initial H.L.(dB)	77.9	70.9	0.118
Final H.L.(dB)	51.7	44.3	0.281
Hearing gain(dB)	26.3	26.4	0.988

extract 1 51.7 dB,
26.3 dB, heparin 2 44.3
dB, 26.4 dB
(Table 4).
laser 1 5 (9.8%),
4 (7.8%)
laser

고찰

가

11)

12)

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, , , ,
가 가
, 가
, , , ,
, , , ,
mumps virus
Wilson ¹¹⁾ 가 가
, Jaffe & Penner ¹³⁾
가
Wilson,¹⁾
Moskowitz ²⁾ (steroid)
,
Darmstadt ¹⁴⁾
steroid
steroid
steroid

, Snow¹⁵⁾ coumarineester compounds, rutosid compounds, ginkgo - extract

, Jaffe¹³⁾, Gussen¹²⁾ (photosensitization) 가 , 가 , ginkgo - extract

histamine phosphate,¹⁰⁾ hyoscine atropine,¹⁰⁾ nicotinic acid,¹⁶⁾ procaine hydrochloride,¹⁶⁾ papaverine hydrochloride¹⁰⁾¹⁶⁾ , carbogen inhalation,⁴⁾²⁰⁾ heparin coumadine 가 15 (29.4%), 10 (19.6%), 7 (13.7%), 19 (37.3%) (Table 2 - 1, 3 - 1), heparin 2 13 (35.1%), 7 (18.9%), 6 (16.2%), 11 (29.7%)(Table 2 - 2, 3 - 2)

heparin steroid dextran, prostaglandin E, urograffin hypague³⁾ , Siegel¹⁰⁾ , 50% ATP , 1/3 , 1/3 , 1/3 가 , Lee¹⁹⁾ steroid, nicotine dextran (38.3%, 15%, 10%, 36.7%), Kim²⁰⁾ carbogen (28.6%, 28.6%, 4.8%, 38.1%) ginkgo - extract (repair mechanism) steroid

Witt,⁸⁾ Oliver,¹⁷⁾ Park 9) photochemical, electro - energetical, magnetic flow dynamical thermal activations, flavoprotein complex(respiratory chain) (redox state) , 15 가 가 가 ADP ATP (phosphorylation) , 가 prostaglandin , collagen 가 succinyl dehydrogenase, lactate dehydrogenase, acidified phosphonase unspecific esterase 가 , Table 2 - 1 Table 2 - “ (repair mechanism) ” 2 1 (p = 0.038), 2 (p = 0.231). . Ginkgo biloba ginkgo - extract ginkgo - extract heparin flavonglycosidea(50%) , 가

Ginkgo - Extract

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결 론
1994 6 1997 6 3
88 , 51 steroid
ginkgo - extract , 37
steroid heparin
가
ginkgo - extract
heparin
15
가 가 가

참고 문헌

- 1) Wilson WR, Byl FM, Laird N. *Efficacy of steroid in the treatment of idiopathic sudden hearing loss. A double-blind clinical study. Arch Otolaryngol* 1980;106:772-6.
- 2) Moskowitz D, Lee KJ, Smith HW. *Steroid use in idiopathic sudden sensorineural hearing loss. Laryngoscope* 1984;94:664-6.
- 3) Shea JJ, Emmett JR, Harell. *Evaluation of diatrizoate meglumine (Hypaque) in treatment of sudden hearing loss. Laryngoscope* 1977:1809-14.
- 4) Fisch U, Murata K, Hossli G. *Measurement of oxygen tension in human perilymph. Acta Otolaryngol (Stock)* 1976;81:278-82.
- 5) Bolognesi AVB. *Sudden deafness: Five cases treated with anticoagulants. Arch Otolaryngol* 1960;72:31-40.
- 6) Takayuki S, Takeshi K, Toru M. *Chronological study of recovery of sudden deafness treated with defibrinogenation and steroid therapies. Acta Otolaryngol (stockh)* 1991;

- 111:867-71.
- 7) Kallinen J, Laurikainen E, Laippala P, Grenman R. *Sudden deafness: A comparison of anticoagulant therapy and carbogen inhalation therapy. Ann Otol Rhinol Laryngol* 1977;106:22-6.
- 8) Witt U. *Neus alternative moglichkeiten bei inneonohrstörungen: Lower-power-LASER and ginkgo-extrakte als kombinationstherapie. Natur-Heilkunde* 1991;32:6-21.
- 9) Park K, Hong BK, Shim SY. *Clinical experience of a new combined therapy of low power laser and ginkgo-extract on tinnitus and sudden deafness. Clin Otol* 1995;6:213-20.
- 10) Siegel LG. *The treatment of idiopathic sudden sensorineural hearing loss. Otolaryngol Clin North Am* 1975;8:467-73.
- 11) Wilson WR, Veltri RW, Laird N. *Viral and epidemiologic studies of idiopathic sudden hearing loss. Otolaryngol Head Neck Surg* 1983;91:653-8.
- 12) Gussen R. *Sudden deafness of vascular origin: A human temporal bone study. Ann Otol Rhinol Laryngol* 1976;85:94-100.
- 13) Jaffe BF, Penner JA. *Sudden deafness associated with hypercoagulation. Trans Am Acad Ophthalmol Otol* 1968;72:774-8.
- 14) Darmstadt GL, Kiethley EM, Harris JP. *Effects of cyclophosphamide on the pathogenesis of cytomegalovirus induced labyrinthitis. Ann Otol Rhinol Laryngol* 1990;99:960-8.
- 15) Snow JB Jr, Suga F. *Control of the microcirculation of the inner ear. Otolaryngol Clin North Am* 1975;8:455-66.
- 16) Shaia F, Sheehy JL. *Sudden sensorineural hearing impairment. A report of 1220 cases. Laryngoscope* 1976;86:389-98.
- 17) Oliver J, Plath P. *Combined low power laser therapy and extract of ginkgo biloba in a blind trial of treatment for tinnitus. Laser Therapy* 1993;5:137-9.
- 18) Shiomi Y, Tsuji J, Naito Y. *The effect of low power laser irradiation on the cochlea. Otol Jpn* 1993;3(4):501.
- 19) Lee JH, Kim JH, Lee KP, Hong SW, Chae SY, Suh BD. *Clinical analysis of sudden hearing loss. Korean J Otolaryngol* 1990;33:690-7.
- 20) Kim JG, Kim JH, Cho WC, Park CJ, Huh CW. *Idiopathic sudden sensorineural hearing loss (I): Effect of carbogen inhalation as a treatment. Korean J Otolaryngol* 1989;32:10-8.