

Original Research Article

To Assess the Efficacy of Intratympanic Steroids when Given Alone or as Combined Therapy with Intravenous Steroids for Sudden Sensorineural Hearing Loss.

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Abstract

Background & Methods: The aim of the study is to assess the efficacy of intratympanic steroids when given alone or as combined therapy with intravenous steroids for sudden sensorineural hearing loss. All Patients were divided into two groups. Group A (14) patients were advised to get admitted for first line treatment for commencement of treatment and Group B (24) those who had taken first line treatment or having contraindications for first line treatment were suggested to take Intratympanic injections on OPD basis.

Results: We found 57.9% improved as outcome & 13.2% Good grade of improvement.

Conclusion: The combination of intratympanic therapy with intravenous is more efficacious than intratympanic therapy alone for sudden sensorineural hearing loss. Good and moderate grade of improvements is more with combination than Intratympanic therapy. This was, however, statistically not significant. Dexamethasone is more efficacious than methylprednisolone as intratympanic therapy. The overall good and moderate degree of improvement is more with dexamethasone as compared to methylprednisolone. However the results obtained was not statistically significant.

Keywords: efficacy, intratympanic, steroids, intravenous & sensorineural.

Study Design: Comparative Study.

1. Introduction

Sudden sensorineural hearing loss (SSHL) is defined as a hearing loss of 30 dB or more, affecting at least 3 consecutive frequencies, occurring within 3 days without any identifiable cause[1]. It is relatively common disease, affecting 5 to 20 per 100,000 persons per year. The cause, pathophysiology, and management of SSHL are still not known. Spontaneous recovery in untreated patients has been reported as ranging from 38% to 65%[2].

Sudden sensorineural hearing loss is one of the causes of otologic emergencies. Sudden sensorineural hearing loss (SSNHL) has been a well-known clinical entity for almost 67 years now, but the controversial definition, diagnosis and a limited understanding of the pathophysiology has resulted in lack of a standard treatment protocol. One of the most widely accepted definition is that of Wilson et al "Sensorineural hearing loss of at least 30 dB in 3 contiguous frequencies occurring over a period of 3 days or less"[3].

A distinction should be drawn between a rapidly progressive and a sudden loss which comes either instantaneously or over several hours[4]. Proposed causes include viral cochleitis, vascular compromise or ischemia of the inner ear, autoimmune inflammation, and inner ear

membrane rupture. Because the activity of steroids includes immune suppression, anti-inflammatory action, membrane stabilization, increased perfusion and sodium transport regulation, it is well reported that steroids is the most widely accepted treatment today. However many patients cannot receive steroids either due to medical reasons (peptic ulcer, glaucoma, diabetes, hypertension, osteoporosis etc.) or sometimes unwillingness for admission[5-7].

2. Material and Methods

In our study total 38 cases of sudden sensorineural and refractory sudden sensorineural hearing loss, which were treated during the period from August 2008 to May 2011 were enrolled. The cases presented in ENT department of P.D. HINDUJA National Hospital & research centre.

Our hospital is tertiary care hospital, so the patients attended to the OPD are referred patients most of the time and they are either completed the first line treatment or on treatment. All patients were seen within 3 months of the onset of Hearing loss and none had recovered prior to treatment.

All Patients were divided into two groups. Group A (14) patients were advised to get admitted for first line treatment for commencement of treatment and Group B (24) those who had taken first line treatment or having contraindications for first line treatment were suggested to take Intratympanic injections on OPD basis.

Group A: It includes those patients(08) who were ready for admission and intravenous infusions first followed by intratympanic injection or those patient (03) who had already taken intravenous steroids not been relieved and came for further treatment or those who were on oral steroids (03).

Group B: It includes the patient (15) who were not ready for admission or those patients for whom systemic steroids were contraindicated or who had completed the oral steroid treatment and not improved. (09).

3. Result

Table No. 1: Distribution of study group as per outcome

Outcome	No.	Percentage
Improved	22	57.9
Not Improved	16	42.1
Total	38	100

Table No. 2: Distribution of study group as per grade of improvement

Outcome	No.	Percentage
Good	05	13.2
Mild	07	18.4
Moderate	10	26.3
No Improvement	16	42.1
Total	38	100

Table No. 3: Distribution of study group as per grade of improvement

Outcome	Improved		Improved		Total		P Value
	No.	Percentage	No.	Percentage	No.	Percentage	

Dexa	15	65.2	08	34.8	23	100	0.258
SM	07	46.7	08	53.3	15	100	
Total	22	57.9	16	42.1	38	100	

Table No. 4: Association between Outcome and T/t type in dexamethasone treated patient

Outcome	Improved		Improved		Total		P Value
	No.	Percentage	No.	Percentage	No.	Percentage	
Dexa	09	56.3	07	43.8	16	100	0.172
SM	06	85.7	01	14.3	07	100	
Total	15	65.2	08	34.8	23	100	

4. Discussion

Sudden sensorineural hearing loss is not a distinct disease, but rather a symptom with several possible etiologies. Many causes of sudden hearing loss have been described such as syphilis, diabetes mellitus, sarcoidosis, Cogan's syndrome etc[8]. To find out the exact cause always remained a challenge (possible in 10-15% cases) Barring special causes, all others fall in idiopathic category. Idiopathic sudden sensorineural hearing loss: (ISSHL) can be the end result and common expression of various types of cochlear insults, such as viral infection, vascular occlusive disease, autoimmune or rupture of intralabyrinthine membranes. Theory of viral labyrinthitis or neuritis is most commonly accepted"[9].

Because of this unknown etiology many different treatment options have been proposed, but none is universally accepted. A MEDLINE search shows 1452 articles for the term "sudden hearing loss and treatment" with various modalities have been suggested from oral, intravenous and intratympanic steroids to vasodilators to hyperbaric oxygen therapy. stellate ganglion blocks and rheophoresis[10-11].

Currently, the most employed treatment of ISSNHL worldwide is that of systemic steroids, through either the oral or intravenous route 'A randomized, controlled trial of Sudden sensorineural hearing loss therapy. was given by Wilson et al to prove efficacy of oral steroid' Later studies showed to reach an adequate Perilymphatic concentration, high doses of steroid should be given[12]. As per one study, although systemic administration of steroids is the most popular, it can occasionally be associated with troublesome complications. "Intratympanic therapy avoids the systemic therapy complications and can be used as an additional treatment in the management of sudden sensorineural hearing loss" or as first line of treatment Battaglia" reported that adding intratympanic dexamethasone to systemic steroids increases the probability of better hearing outcomes[13].

5. Conclusion

The combination of intratympanic therapy with intravenous is more efficacious than intratympanic therapy alone for sudden sensorineural hearing loss. Good and moderate grade of improvements is more with combination than Intratympanic therapy. This was, however, statistically not significant. Dexamethasone is more efficacious than methylprednisolone as intratympanic therapy. The overall good and moderate degree of improvement is more with dexamethasone as compared to methylprednisolone. However the results obtained was not statistically significant.

6. References

1. Gundogan O, Pinar E, Yigiter AC. Therapeutic Efficiency of the Combination of Intratympanic Methylprednisolone and Oral Steroid for Idiopathic Sudden Deafness. *Otolaryngology Head and Neck Surgery* 2013; Published online at <http://oto.sagepub.com/content/early/2013/08/16/0194599813500754>
2. Arslan N, Oguz H, Samim E. Combined Intratympanic and Systemic Use of Steroids for
3. Idiopathic Sudden Sensorineural Hearing Loss. *Otology and Neurotology* 2011;32:393-397.
4. Ahn J, Yoo MH, Chung J. Can Intratympanic Dexamethasone Added to Systemic Steroids Improve Hearing Outcome in Patients With Sudden Deafness? *Laryngoscope* 2008;118:279-282
5. Dispenza F, Amodio E, Riggio F. Treatment of sudden sensorineural hearing loss with transtympanic injection of steroids as single therapy: a randomized clinical study. *Eur Arch Otorhinolaryngol* 2011;268:1273-1278
6. Hong SM, Park CH, Lee JH. Hearing outcomes of daily intratympanic dexamethasone alone as primary treatment modality for ISSHL. *Otolaryngology Head and Neck Surgery* 2009;141:579-583.
7. Battaglia A, Burchette R, Cueva R. Combination Therapy (Intratympanic Dexamethasone + High-Dose Prednisone Taper) for the Treatment of Idiopathic Sudden Sensorineural Hearing Loss. *Otology and Neurotology* 2008;29:453-460.
8. Rauch S, Halpin C, Reda D. Oral vs Intratympanic Corticosteroid Therapy for Idiopathic Sudden Sensorineural Hearing Loss. *JAMA* 2011;305:2071-79
9. Li P, Zeng X, Li Y. Intratympanic Methylprednisolone Improves Hearing Function in Refractory Sudden Sensorineural Hearing Loss: A Control Study. *Audiology and Neurotology* 2011;16:198-202.
10. Wu HP, Chou YF, Chen PR. Intratympanic Steroid Injections as a Salvage Treatment for Sudden Sensorineural Hearing Loss: A Randomized, Double-Blind, Placebo-Controlled Study. *Otology and Neurotology* 2011;32:774-779.
11. Lee J, Choi S, Choung YH. The Efficiency of intratympanic dexamethasone injection as a sequential treatment after initial systemic steroid therapy for sudden sensorineural hearing loss. *Eur Arch Otorhinolaryngol* 2011;268:833-839.
12. Zhou Y, Zheng H, Campione PA. Early Transtympanic Steroid Injection in Patients with 'Poor Prognosis' Idiopathic Sensorineural Sudden Hearing Loss. *ORL J. Otorhinolaryngol Relat Spec* 2011;73:31-37
13. Chou YF, Chen PR, Wu HP. Comparison of Intermittent Intratympanic Steroid Injection and Near-Continual Transtympanic Steroid Perfusion as Salvage Treatments for Sudden Sensorineural Hearing Loss. *Laryngoscope* 2013;123:2264-2269