Brief Review of Meniere's Disease And Current Treatment Update

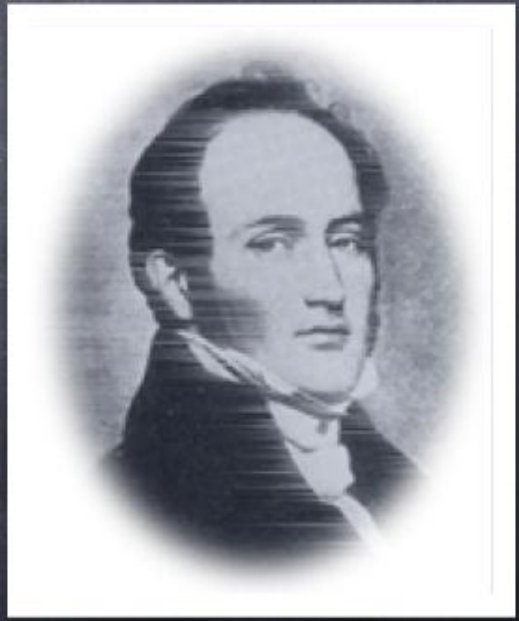
Reporter: 丁冠中
Supervisor: 褚嘉慧醫師

Outlines

- Brief Review of Meniere's Disease
- Current Treatment Update

What is Meniere's Disease

- A condition that is thought to arise from abnormal fluid and ion homeostasis in the inner ear.
- Prospere Meniere, a French physician
  - First reported that the inner ear could be the source of a syndrome manifesting episodic vertigo, tinnitus, and hearing loss



en. wikipedia.org

Epidemiology

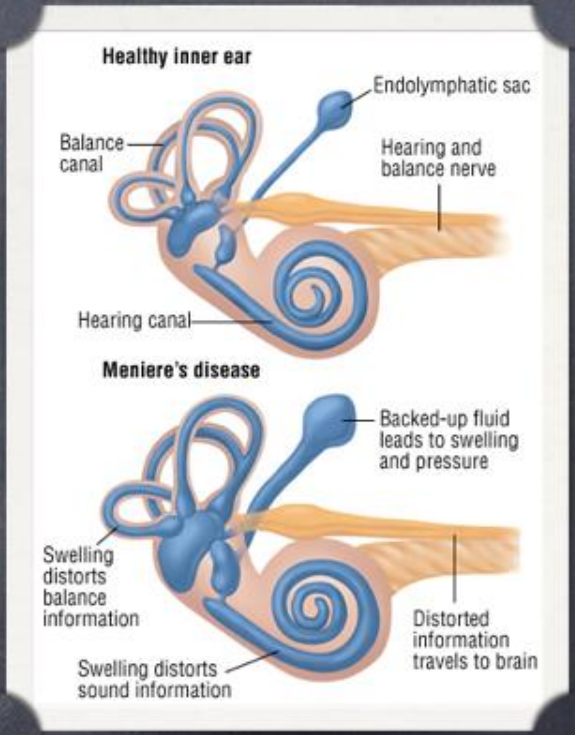
- Female > 1.3 x Male
- More common in adults in their fourth and fifth decade
- A strong positive family history
- Affect more white people of northern European descent than it does the African and black races.

Mumbai: Prajakta Arts,1997: 310–31.

Philadelphia: WB Saunders, 1991: 1689–714.

Pathophysiology

- Endolymphatic hydrops
- Paparella "Lake-River-Pond"
- Endolymph
  - Produced: Stria vascularis
  - Absorbed: Endolymphatic duct and sac (Active transport mechanism)



Acta Otolaryngol Suppl 1991; 485: 26-35.

Diagnosis

Panel: **The American Academy of Otolaryngology—Head and Neck Surgery criteria for diagnosis of Meniere's disease (1995)**

1. Recurrent spontaneous and episodic vertigo. A definitive spell of vertigo lasting at least 20 min, often prostrating, accompanied by disequilibrium that can last several days; usually nausea or vomiting, or both; no loss of consciousness. Horizontal rotatory nystagmus is always present
2. Hearing loss (not necessarily fluctuating)
3. Either aural fullness or tinnitus, or both

Certain Meniere's disease
Definite disease with histopathological confirmation

Definite Meniere's disease
Two or more definitive episodes of vertigo with hearing loss, plus tinnitus, aural fullness, or both

Probable Meniere's disease
Only one definitive episode of vertigo and the other symptoms and signs

Possible Meniere's disease
Definitive vertigo with no associated hearing loss or hearing loss with non-definitive disequilibrium

Lancet 2008; 372: 406–14

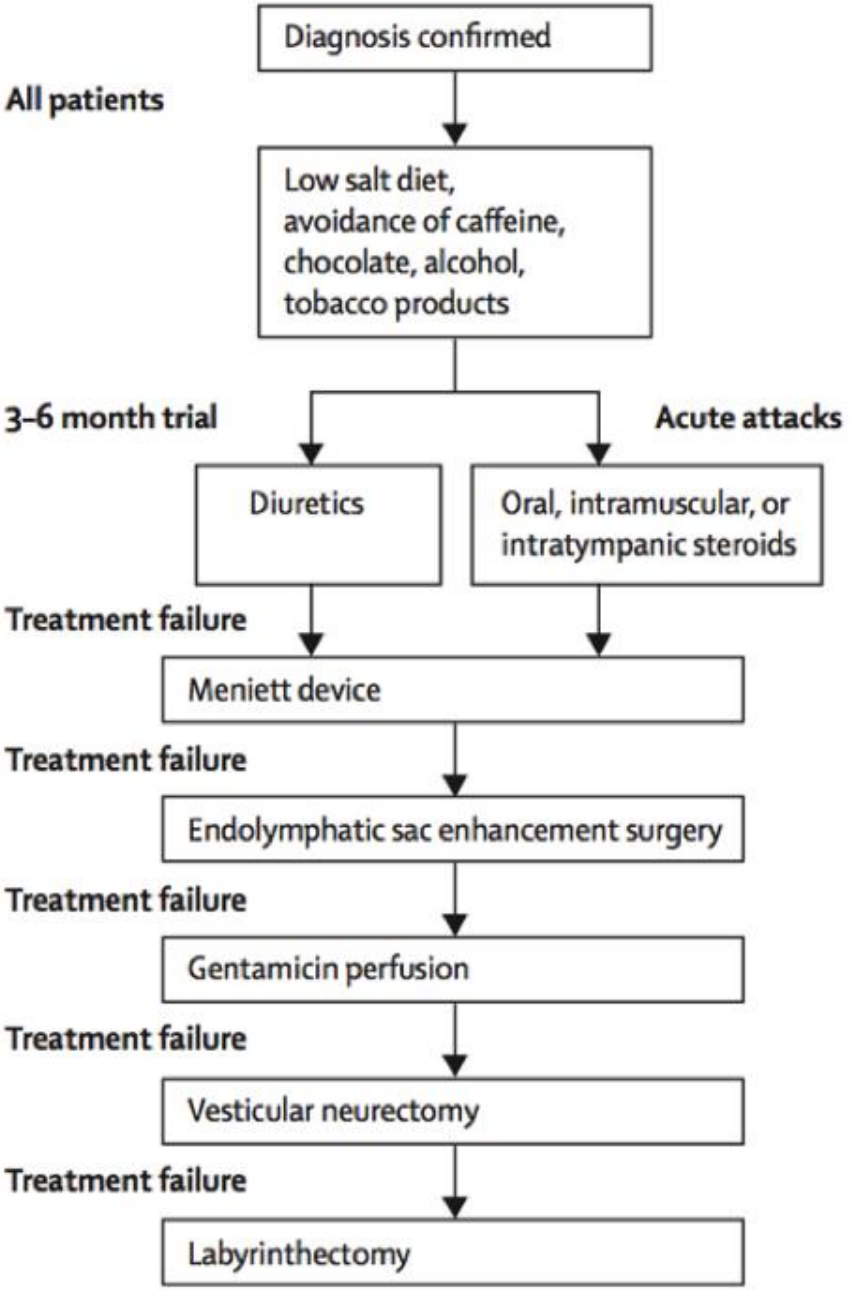
Staging of Meniere's disease

Table 2
Staging of Ménière's disease according to the 1995 guidelines of the Committee on Hearing and Equilibrium of the American Academy of Otolaryngology and Head & Neck Surgery

Stage	Four-tone Average (dB)
1	≤25
2	26–40
3	41–70
4	>70

Otolaryngol. Clin N Am 44(2011) 383–403

Treatment



Lancet 2008; 372: 406–14

Lifestyle Changes

- Strong association with seasonal allergies and circulating immune-complexes exists
- Avoid caffeine, chocolate, alcohol, and salt
- Salt intake < 2g per day

Diuretics

- Recent studies have suggested no relation between use of diuretics and Meniere's disease
- Most of the time diuretics are a fairly safe option
- Hydrochlorothiazide + Triamterene

Pressure Pulse Treatment

- Meniett
- A significant reduction in the frequency and intensity of vertigo, tinnitus, and aural pressure in the group using the Meniett device compared with the placebo group.
- No significant side-effects
- Long-term efficacy of the Meniett device is poor

Steroids

- For acute and chronic symptoms of Meniere's disease
- For acute attacks
  - IM or IV methylprednisolone can be used to control the severe hearing loss and vertigo followed by oral prednisone at a dose of 1 mg/kg, given on a daily basis for 10–14 days before a slow tapering dose
- Significant reduction of vertigo and tinnitus, but no change in aural fullness or hearing

Gentamicin Transtympanic Perfusion

- Direct damage
  - the sensorineural epithelium
  - the dark cells of the labyrinth
- Much higher rate of sensorineural hearing loss in the gentamicin group than in those who had vestibular neurectomy.

Endolymphatic sac Surgery

- A wide decompression of the sigmoid sinus, localisation of the endolymphatic sac, and insertion of a custom-made Silastic sheeting along with Silastic spacers in the sac and perisaccular area.
- Thomsen and colleagues concluded that ESE surgery had no advantages compared with a placebo operation.
  - The main feature of ESE surgery is the decompression of the sigmoid sinus
  - Successful complete mastoidectomy (same as placebo)

Ann N Y Acad Sci 1981; 374: 820–30.

Vestibular Nerve Section

- The gold standard in vestibular neurectomy procedures
  - Combined retrolabyrinthine/retrosigmoid vestibular nerve section
- At most otological centres, vestibular neurectomy is undertaken far less now than it was in the mid-1980s.

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Endolymphatic Sac Surgery Versus Intratympanic Gentamicin for the Treatment of Intractable Ménière's Disease: A Retrospective Review With Survey

Josee Paradis, Amanda Hu, and Lorne S. Parnes

Department of Otolaryngology, Head & Neck Surgery, Western, London, Canada

Objectives

- To review a 10-year experience of endolymphatic sac surgery and intratympanic gentamicin for intractable Meniere's disease
- To compare preoperative and postoperative outcomes.

PICO

- Patients: Patients treated with ESS or ITG between 1997 and 2007 at London Health Sciences Centre were eligible for recruitment.
- Interventions: ESS or ITG
- Main Outcomes:
  - 1995 American Academy of OtolaryngologyY Head and Neck Surgery hearing stage, vertigo class, and functional level
  - A 40-item validated quality-of-life questionnaire (MD Outcome Questionnaire).

Results

Preoperatively

TABLE 1. *Demographic data*

		Intratympanic gentamicin	Endolymphatic sac surgery	*p* value
Age[a]		59	40	0.006
Sex	Male	15	17	NS
	Female	22	13	NS
Surgical side	Right	17	16	NS
	Left	20	14	NS
Preoperative symptom	Aural fullness	26	21	NS
	Tinnitus	32	30	NS

NS indicates not significant.
[a]Statistical significant difference.

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- Sixty-seven patients were recruited

  (n = 30 ESS; n = 37 ITG).

- There were no differences between groups on functional level and QOL measures.

Preoperatively

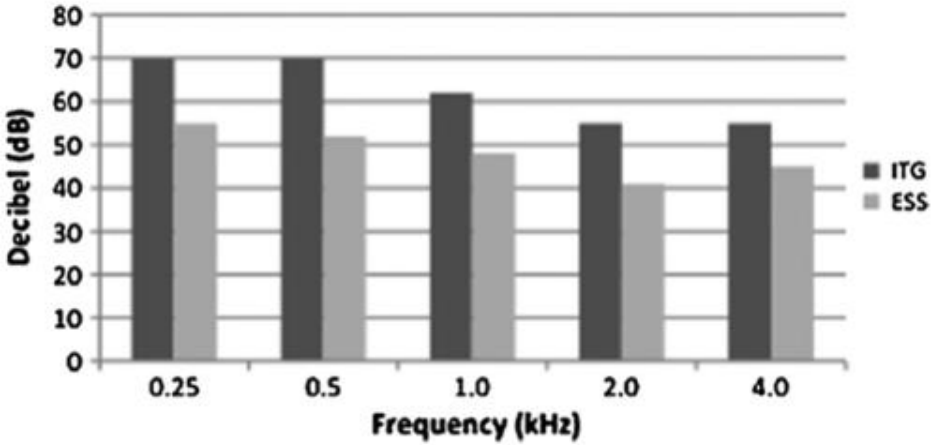

FIG. 1. Preoperative audiogram by group. *There is a significant difference between groups across all frequencies.

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- The ITG group had poorer hearing stage (p = 0.03).

Postoperatively

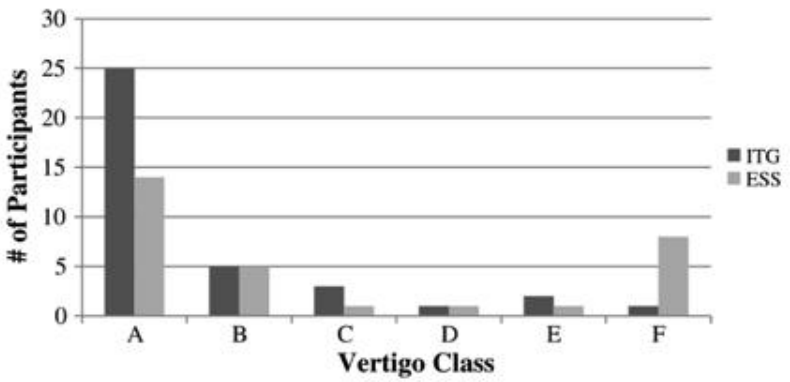

FIG. 4. Vertigo class by group. *There is no statistical difference in vertigo class between groups.

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- There were no differences in post-treatment vertigo class.
- ESS patients reported more tinnitus (p = 0.003) and aural fullness (p = 0.01).
- Secondary treatment was required for 27% of patients in the ESS compared with 3% in the ITG.

Postoperatively

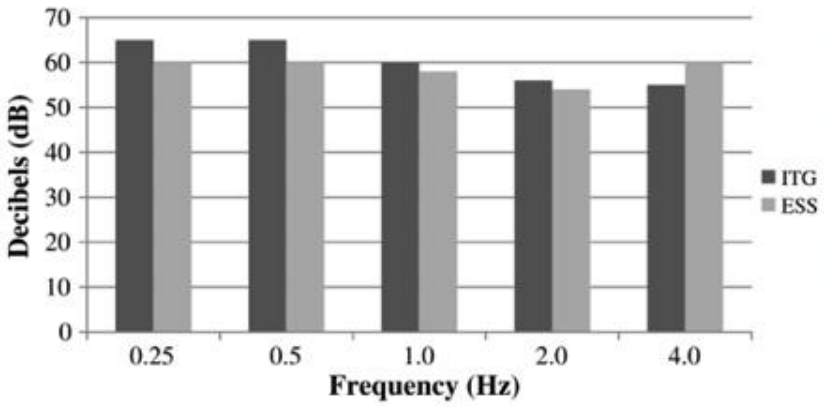

FIG. 3. Postoperative audiogram by group. *There is no significant difference in postoperative hearing between groups.

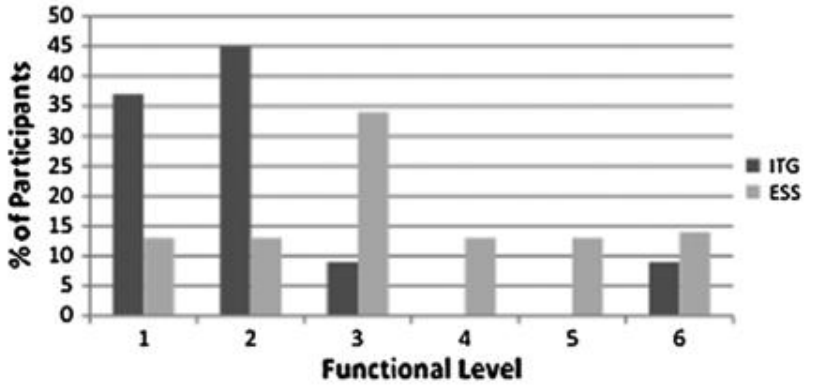

FIG. 5. Postoperative functional level by group. * There is a significant difference in functional level between groups ($p = 0.02$).

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- Post-treatment hearing remained unchanged for the ITG and was overall decreased in the ESS group (p = 0.03).
- Participants in the ITG reported better postoperative functional levels (p = 0.02) and higher global (p = 0.04), social (p = 0.001), and overall QOL scores (p = 0.03).

Conclusion

- ITG, compared with ESS, reveals better post-treatment functional levels, and superior global, social, and overall QOL scores.
- Although no statistical difference in vertigo class, a clinical difference is observed.

Original Research—Otology and Neurotology

The Effect of Intratympanic Methylprednisolone and Gentamicin Injection on Ménière's Disease

Nathalie Gabra[1], and Issam Saliba, MD, FRCS[1]

AMERICAN ACADEMY OF OTOLARYNGOLOGY–HEAD AND NECK SURGERY FOUNDATION

Otolaryngology–Head and Neck Surgery
148(4) 642–647

DOI: 10.1177/0194599812472882
http://otojournal.org
SAGE

Objectives

- To compare the efficacy of intratympanic injections of methylprednisolone (ITMP) and intratympanic injections of gentamicin (ITG) to control the symptoms of Meniere's disease and to evaluate their effect on hearing level.

Methods

- Eighty-nine patients affected by Meniere's disease were included in this study
  - 47 were treated with ITG and 42 were treated with ITMP.

Table 1. Patients Characteristics in the Intratympanic Injections of Gentamicin (ITG) and Intratympanic Injections of Methylprednisolone (ITMP) Groups

Group		ITG	ITMP	*P* Value
Number		47	42	.711
Sex, No. (%)	Male	19 (40 %)	11 (26 %)	.156
	Female	28 (60 %)	31 (74 %)	
Age, y		54.3	53	.824

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- pure-tone average (PTA)
- Speech discrimination score (SDS).

Methods

- Eighty-nine patients affected by Meniere's disease were included in this study
  - 47 were treated with ITG and 42 were treated with ITMP.
- Two periods of follow-up were considered:
  - 0 to 6 months and 6 to 12 months after the intratympanic injections (ITI).
- Mean outcome measurements:
  - control of vertigo attacks, tinnitus, and aural fullness;
  - pure-tone average (PTA)
  - Speech discrimination score (SDS).

Results

Vertigo Control

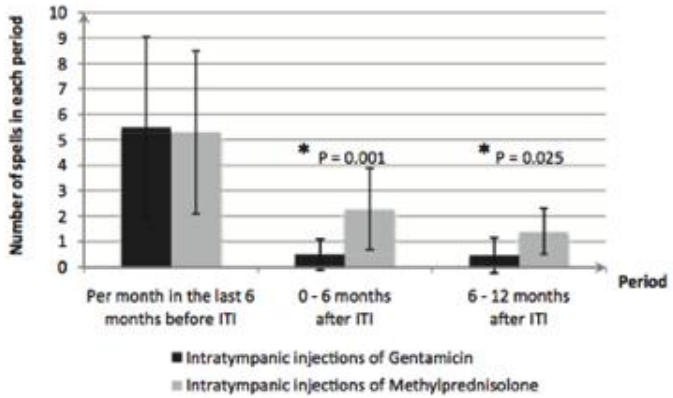

Figure 1. Mean number of vertigo attacks before and after intratympanic injections (ITI). We considered the number of spells per month in the last 6 months before ITI and the total number of spells 0 to 6 months and 6 to 12 months after ITI. *Statistically significant difference; error bars represent the standard deviation.

Table 2. Evolution of Vertigo Spells after Treatment in the Intratympanic Injections of Gentamicin (ITG) and Intratympanic Injections of Methylprednisolone (ITMP) Groups

Vertigo Spells	ITG	ITMP	*P* Value
No. of patients	42	41	
0-6 months after ITI, %			
None	78.6	41.5	.001
At least 1	21.4	58.5	
No. of patients	35	27	
6-12 months after ITI, %			
None	82.9	48.1	.004
At least 1	17.1	51.9	

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- There was a statistically significant difference between the ITG and ITMP groups in 0 to 6 months and 6 to 12 months after ITI (P=.001 and P= .025, respectively)

Tinnitus Control

Table 3. Tinnitus Control in the Intratympanic Injections of Gentamicin (ITG) and Intratympanic Injections of Methylprednisolone (ITMP) Groups

Presence of Tinnitus	ITG, No. (%)	ITMP, No. (%)	*P* Value
Before ITI	47 (100)	42 (100)	—
0-6 months after ITI	43 (30.2)	41 (78)	<.001
6-12 months after ITI	33 (27.3)	25 (68)	.002

Abbreviation: ITI, intratympanic injections; —, not applicable.

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Aural Fullness

- In the ITG group, 93.6% of patients had aural fullness before ITI and 16.3% still had it after ITI.
- In the ITPM group, 95.2% had aural fullness before ITI and 65% after ITI.
- No statistically significant difference before ITI ($P = 0.634$)
- A statistically significant difference between the 2 groups ($P < .001$) after ITI.

Pure Tone Average

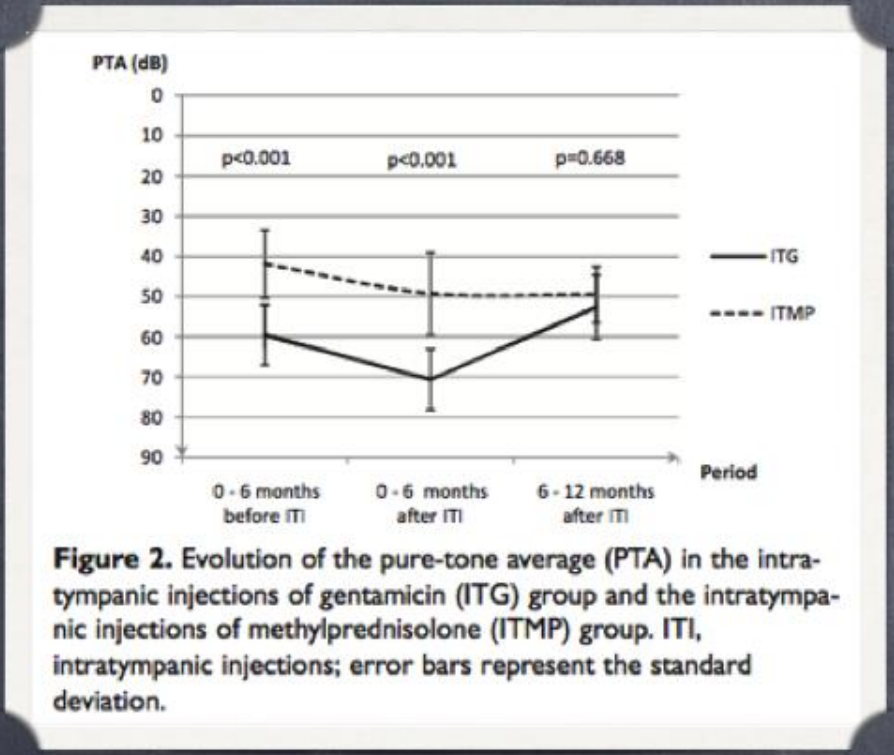

Figure 2. Evolution of the pure-tone average (PTA) in the intratympanic injections of gentamicin (ITG) group and the intratympanic injections of methylprednisolone (ITMP) group. ITI, intratympanic injections; error bars represent the standard deviation.

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- The 2 groups had a statistically significant difference in hearing level before ITI (P < .001).
- This difference was no longer present 6 to 12 months after ITI (P >.05).

Speech Discrimination Score

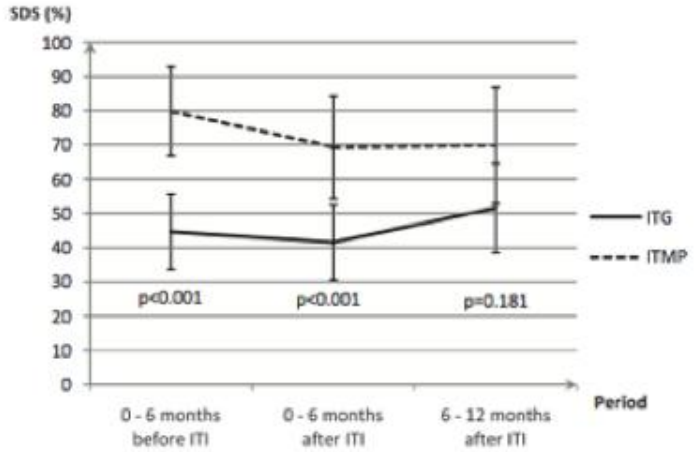

Figure 3. Evolution of the speech discrimination score (SDS) in the intratympanic injections of gentamicin (ITG) group and the intratympanic injections of methylprednisolone (ITMP) group. ITI, intratympanic injections; error bars represent the standard deviation.

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- There was no statistically significant difference in the evolution of SDS between the 2 groups after ITI.

Conclusion

- Intratympanic injections of gentamicin are more efficient than ITMP in controlling the symptoms of Meniere's disease.
- The 2 groups ended up without a difference in hearing level after ITI.
- According to these findings, administrating ITMP to control Meniere's disease seems to be less beneficial than ITG.

The Journal of Laryngology & Otology (2013), 127, 20–24.

doi:10.1017/S0022215112002605

MAIN ARTICLE

Intratympanic gentamicin treatment for unilateral Ménière's disease: long-term follow up of a proven regime

J WASSON[1], N UPILE[2], A PFLEIDERER[2]

[1]Department of Otolaryngology, Norfolk and Norwich University Hospital, and [2]Department of Otolaryngology, Peterborough City Hospital, UK

Objective

- To determine the long-term efficacy of a fixed-dose intratympanic gentamicin treatment regime in controlling unilateral Ménière's disease.

Methods

- Pfleiderer (1998) published two-year follow-up results for a series of 16 patients treated with a 4-day, 12-dose intratympanic gentamicin regime for unilateral Ménière's disease.
- In 2010, a long-term telephone follow up (mean 17 years and 3 months) of this same cohort was conducted to determine long-term vertigo control.
- Of the 16 patients, 13 were eligible for the long-term follow up.

Results

- At 2 years' follow up, all 16 patients experienced substantial control of vertigo, with complete control achieved in 87 per cent of cases.
- At the long-term follow up, 9 of the 13 eligible patients were contactable, and all reported complete control of vertigo.

TABLE II

PATIENT DATA AT LONG-TERM FOLLOW UP*

Pt no	Additional treatment	Contactable	FU period	Vertigo†	Contralateral ear symptoms‡	Disequilibrium	Patient comments
1	No	Yes	18y 10mth	No	No	No	'Felt suicidal pre-treatment…best thing ever happened'
2	No	No	–	–	–	–	–
3	No	Yes	18y 4mth	No	No	No	–
4	1 course (after 7y)	Yes, but excluded	–	–	Yes	–	–
5	No	Deceased	–	–	–	–	–
6	No	Yes	17y 3mth	No	No	No	'Successful return to work as a GP'
7	No	Yes	16y 10mth	No	No	No	–
8	No	No	–	–	–	–	–
9	No	No	–	–	–	–	–
10	No	Yes	16y 10mth	No	No	Yes	'Extremely grateful'
11	No	Yes	16y 6mth	No	No	Yes	'Treatment gave me my life back'
12	No	No	–	–	–	–	–
13	No	Yes	16y	No	No	No	–
14	No	Yes	15y 9mth	No	No	Yes	–
15	No	Yes	15y 8mth	No	No	No	–
16	No	Deceased	–	–	–	–	–

*Results of intratympanic gentamicin treatment in patients with a minimum follow up of 15 years and 8 months. †Any incidence of vertigo after the two-year follow up. ‡Contralateral ear symptoms included fluctuating hearing loss, aural fullness and tinnitus. Pt no = patient number; FU = follow up; y = years; mth = months

Conclusion

- Fixed-dose intratympanic gentamicin controlled symptomatic unilateral Ménière's disease in both the short and long term.

Thank You