



COMPARATIVE STUDY ON SYMPTOMATIC TREATMENT IN MÈNIÈRE'S WITH DIURETICS AND WITHOUT DIURETICS

Otorhinolaryngology

Dr Santosh UP	Professor, Department Of Otorhinolaryngology, JJMMC, Davanagere Karnataka India.
Dr Anet Jenifer Dsouza	Post Graduate, Department Of Otorhinolaryngology, JJMMC, Davanagere Karnataka India.
Dr Arfan Nasser	Senior Resident, Department Of Otorhinolaryngology, JJMMC, Davanagere Karnataka India.

ABSTRACT

Mènière's disease (MD) is a non-lethal and non-communicable inner ear disorder characterized by tinnitus, episodic vertigo, fluctuating sensorineural hearing loss and aural fullness. With an incidence of 15.6 cases per 100,000 among the Indian population [1]. Different treatments have been tried ranges from low-salt diet to betahistine, steroids and diuretics for acute attacks and surgical procedures in refractory cases. **Aim:** To evaluate the effectiveness of diuretics in patients diagnosed with MD. **Methodology:** 50 patients with diagnosed with MD based on clinical history were enrolled in the study between August 2022 to August 2024. 25 patients (Group A) were treated with Tab Furosemide 40mg 1-0-0 orally + Tab Deflazacort 6mg 1-1-1 orally + Tab Cinnarizine 20mg + Dimenhydrinate 40mg combination 1-0-1 orally for 10 days and 25 patients (Group B) were treated with Tab Deflazacort 6mg 1-1-1 orally + Tab Cinnarizine 20mg + Dimenhydrinate 40mg combination 1-0-1 orally for 10 days. Vertigo episodes, dizziness handicap inventory (DHI) score, tinnitus handicap inventory (THI) scale were compared pre intervention and post intervention after 10 days. **Results:** Both groups had improvements in DHI and THI scores post treatment. The post-treatment the mean difference in total DHI scores and emotional domain scores were statistically better in Group A. However, there was no significant difference in mean difference of THI scores between Group A and Group B. **Conclusion:** In patients with unilateral MD, both Group A and Group B were effective in relieving symptoms. Neither group showed significant changes in hearing levels during this period. However, Group A with diuretics exhibited greater improvements in overall DHI scores and DHI emotional scores compared to Group B.

KEYWORDS

Mènière's disease, Diuretics, Dizziness handicap inventory score and Tinnitus handicap inventory scale.

INTRODUCTION

Mènière's disease (MD) is an idiopathic, inner ear disorder, characterised by recurrent spontaneous vertigo accompanied by fluctuating or progressive sensorineural hearing loss, tinnitus and aural fullness in the affected ear. MD is the idiopathic type of endolymphatic hydrops. It is a non-life-threatening and non-communicable disease, with an incidence of 15.6 cases per 100,000 among the Indian population [1]. Since Prosper Meniere first described the disease in the 19th century, the treatment and rehabilitation options available to patients have undergone significant changes.

The typical treatment approach for MD involves conservative methods such as lifestyle and diet adjustments, along with medical interventions like diuretics and betahistine. When these measures prove ineffective, intratympanic injections of gentamicin or steroids may be administered. Treatment protocols vary among different medical centers, and opinions differ regarding the efficacy of various therapies. Therefore, there is a necessity for a study to compare the effectiveness of different drugs in providing symptomatic relief for MD.

The aim of this study is to evaluate the effectiveness of diuretics in patients diagnosed with MD by assessing:

1. Pre and post treatment dizziness in both groups.
2. Pre and Post treatment tinnitus in both groups.

Methodology

Sources Of Data:

During the study, those patients of either sex of age ≥ 18 years old presenting to the ENT Outpatient department at J.J.M Medical College, Davangere and Chigarteri district hospital, Davangere were selected.

- **Study Of Design:** Prospective comparative study.
- **Study Duration:** August 2022 to August 2024.
- **Sample Size:** 50 patients attending OPD with symptoms of tinnitus, vertigo, fluctuating hearing loss and aural fullness who fulfilled all the inclusion and exclusion criteria and those willing to participate in the study were selected and informed and written consent was taken from all the patients.

Inclusion Criteria:

- Individuals with history of tinnitus, vertigo, fluctuating hearing loss and aural fullness.

- Either sex.
- Adults (≥ 18 years old).
- Patients with normal Renal function tests.

Exclusion Criteria:

- Individuals with diabetes, hypertension, chronic kidney disease and cerebrovascular disease.
- Individuals who have undergone any surgical treatment for MD in the past
- Individuals who are contraindicated to diuretics.
- Individuals who present with head injury but are not willing to participate in the study.

Sampling Procedure:

50 patients visiting the outpatient department with symptoms of tinnitus, vertigo, fluctuating hearing loss, and aural fullness were selected for the study. A detailed history was taken, including the Dizziness Handicap Inventory (DHI) score and Tinnitus Handicap Inventory (THI) score. otological examinations and Pure-Tone Audiometry (PTA) with impedance testing were conducted.

The patients were then randomly divided into two groups

- **Group A** – Receiving Tab Furosemide 40mg 1-0-0 orally Tab Deflazacort 6mg 1-1-1 orally + Tab Cinnarizine 20mg + Dimenhydrinate 40mg combination 1-0-1 orally for 10 days.
- **Group B** – Receiving Tab Deflazacort 6mg 1-1-1 orally + Tab Cinnarizine 20mg + Dimenhydrinate 40mg combination 1-0-1 orally for 10 days.

All patients were reviewed after 10 days and 1 month, where the DHI score and THI score were again assessed.

The Tools Used For Comparison And Analysis Of Symptomatology Were:

- DHI
- THI

Dizziness handicap inventory (DHI) is a 25-item self-reported questionnaire designed to quantify the impact of dizziness on daily activities by assessing the perceived handicap experienced by patients [2].

It Comprises Of Three Domains:

1. Functional- 9 questions

2. Emotional- 9 questions
3. Physical- 7 questions

The scores from the DHI are summed to yield a maximum score of 100 and a minimum score of 0. A higher score indicates a greater perceived handicap due to dizziness.

- 16-34 Points (mild handicap)
- 36-52 Points (moderate handicap)
- 54+ Points (severe handicap)

Tinnitus handicap inventory (THI) is a self-administered test used to assess the degree of distress and handicap experienced by the patient. The THI was developed in 1996 by Newman et al. [3]

It Consists Of 25 Questions Divided Into Three Groups.

1. Functional- 11 questions
2. Emotional- 9 questions
3. Catastrophic- 5 questions

The Total Score Obtained Is Summed Up And Classified As Follows

- 0-16- slight- only heard in quiet environments.
- 18-36- mild- easily masked by sounds of the environment. Can be easily forgotten with activities.
- 38-56- moderate- noticed inspite of background noise. Activities of daily living can still be performed.
- 58-76- severe- always heard, disturbs sleep and interferes with daily activities.
- 78- 100- catastrophic- disturbs sleep and affects all activities.

A minimum change of 6-7 points in the THI score is considered clinically significant.

RESULTS

Of the two groups, the average ages were 55.1 +/- 10.7 years and 56.8 +/- 13.1 years in Group A and Group B respectively with 6 (24.0%) males and 19 (76.0%) females in Group A and 9 (36.0%) males and 16 (64.0%) females in Group B. All the cases had unilateral symptoms with 13 (52.0%) right sided and 12 (48.0%) left sided in Group A and 12 (48.0%) right sided and 13 (52.0%) left sided in Group B. Mean duration of symptoms were 8.04 +/- 4.783 months and 10.28 +/- 3.985 months in Group A and Group B respectively.

Table 1: Comparison Of Pre And Post-treatment Dhi Scores Within Group A (with Diuretic)

DHI	Time	Mean	SD	P value	Mean difference
Total	Pre	53.04	17.060	.001	14.67
	Post	43.36	14.885		
Functional	Pre	18.64	5.155	<.001	3.87
	Post	15.44	4.601		
Emotional	Pre	17.84	7.592	<.001	4.29
	Post	14.64	6.291		
Physical	Pre	16.64	4.499	.001	2.42
	Post	15.04	4.247		

Table 2: Comparison Of Pre And Post-treatment Dhi Scores Within Group B (without Diuretic)

DHI	Time	Mean	SD	P value	Mean difference
Total	Pre	56.48	20.135	<.001	4.26
	Post	53.20	18.358		
Functional	Pre	19.60	6.377	<.001	1.75
	Post	18.32	5.907		
Emotional	Pre	19.52	8.761	.001	1.21
	Post	18.72	8.101		
Physical	Pre	17.44	5.181	<.001	1.85
	Post	16.16	4.758		

Table 1 and 2 shows that post treatment both groups showed improvements in the DHI scores and symptoms associated with it. But in comparison the mean difference in total DHI score and the emotional score improvement is higher in Group A than Group B.

Table 3: Comparison Of Pre And Post-treatment Thi Scores Within Group A (with Diuretic)

THI	Time	Mean	SD	P value	Mean difference
Total	Pre	54.00	11.328	<.001	8.98
	Post	46.16	11.430		
Functional	Pre	21.60	5.066	<.001	3.33
	Post	18.80	5.164		
Emotional	Pre	18.96	4.286	<.001	3.16
	Post	16.40	4.546		
Catastrophic	Pre	13.44	3.029	<.001	2.84
	Post	10.96	3.062		

THI	Time	Mean	SD	P value	Mean difference
Total	Pre	55.84	12.999	<.001	5.40
	Post	51.52	13.016		
Functional	Pre	22.00	5.598	<.001	1.88
	Post	20.56	5.643		
Emotional	Pre	19.68	4.888	.001	1.36
	Post	18.80	4.967		
Catastrophic	Pre	14.16	3.602	<.001	2.41
	Post	12.16	3.602		

Table 4: Comparison Of Pre And Post-treatment Thi Scores Within Group B (without Diuretic)

THI	Time	Mean	SD	P value	Mean difference
Total	Pre	54.00	11.328	<.001	8.98
	Post	46.16	11.430		
Functional	Pre	21.60	5.066	<.001	3.33
	Post	18.80	5.164		
Emotional	Pre	18.96	4.286	<.001	3.16
	Post	16.40	4.546		
Catastrophic	Pre	13.44	3.029	<.001	2.84
	Post	10.96	3.062		

Table 3 and 4 shows that post treatment both groups showed improvements in the THI scores and symptoms associated with it. But in comparison the mean difference in improvement in the scores is comparable among the two arms of the study. Showing no statistically significant difference.

DISCUSSION

Since Prosper Meniere first described the disease in the 19th century, the treatment and rehabilitation options available to patients have undergone significant changes. Still there is no consensus on managing acute episodes of MD or the period between episodes. During the IFOS Congress in Paris in June 2017, an international consensus (ICON) Round Table brought together six MD experts from different continents (Asia, America, Europe, and Australia) to develop a minimal consensus, summarized in an algorithm for clinicians to treat MD. The treatment aims first to reduce the frequency and secondarily the severity of vertigo crises, with minimal impairment of hearing function. Treatment is symptomatic and should address the patient's main complaint. Conservative treatments are used regardless of hearing function, while destructive ones are preferably used in patients with hearing loss.

While lifestyle adjustments and positive experiences are universally recommended, there is no conclusive evidence demonstrating their effectiveness. Dietary recommendations for managing MD often include a salt-restricted diet (1.5 g per day) and avoidance of caffeine, fat, alcohol, and tobacco.

The use of diuretics in MD is based on their mechanism of action that involves regulation or modulation of ion transport across membranes. If the symptoms of MD are related to endolymphatic hydrops, then the mechanisms of symptom relief with diuretic agents could be explained by the reduction of the hydrops and/or reversal of ion gradient abnormalities that result in disruption of vestibular and auditory physiology. Diuretic therapies for MD are often initiated as first-line therapy.

Furosemide inhibits Na⁺/K⁺/2Cl⁻ symporter in nephron and increases urine production and sodium excretion. Furosemide helps reduce fluid retention and endolymphatic pressure, while potassium supplementation or spironolactone helps counteract potassium loss.

There is no conclusive evidence regarding the efficacy of drugs used during an acute episode of vertigo. However, there is general agreement among experts that symptomatic management during acute attacks can be helpful. These treatments are typically administered for a short duration to support central compensation and alleviate symptoms.

Della Santina et al. [4] demonstrated that diuretics were effective in decreasing both the frequency and severity of vertiginous episodes. In our study patients experienced a noticeable reduction in vertigo frequency and severity, as measured by the THI scores and DHI scores in the diuretic group.

Wilson K. et al. [5] showed that Diuretics are highly effective in

managing vertigo associated with MD. The significant reduction in DHI scores in their study demonstrates the ability to alleviate the functional and emotional impact of dizziness. However, the impact of diuretics on THI scores was less pronounced hence suggesting that while diuretics are effective for vertigo, they may have limited benefits for tinnitus.

Acharya et al., [6] in their study showed that diuretics (Amiloride 5 mg and furosemide 40 mg) were effective in improving number and severity of vertigo and tinnitus score though it was ineffective in improving the hearing outcome.

In our study, the post-treatment DHI scores indicated that Group A showed greater improvement than Group B, both overall and in the emotional domains.

However, there was no significant difference in THI scores between Group A and Group B post-treatment.

CONCLUSION

The following conclusions are drawn from our study, in patients with unilateral MD, both Group A and Group B were effective in alleviating symptoms, showing improvement in vertigo control, DHI scores, and THI scores during short-term post-intervention follow-up. Neither group exhibited significant changes in hearing levels post-treatment during this period.

However, Group A demonstrated better improvement in overall DHI scores and DHI emotional scores compared to Group B.

One of the major limitations in our study would be the short term in follow up chosen. But since this study focused more on the acute phase and symptoms further look into the long-term aspect of treatment with this combination and dose of medications is needed. The other limitation would be the small study group which may benefit from a possible multi-center study.

REFERENCES

1. Selvakumar P, Balraj A, Kurien R, Krishnan T. Clinical and Audio Vestibular Profile of Ménière's Disease in a Tertiary Care Centre in India. *Indian J Otolaryngol Head Neck Surg.* 2012 Dec;64(4):351-5.
2. Jacobson GP, Newman CW. The Development of the Dizziness Handicap Inventory. *JAMA Otolaryngology-Head & Neck Surgery* 1990
3. Newman. Development of the Tinnitus Handicap Inventory. *JAMA Otolaryngology-Head & Neck Surgery* 1996.
4. Della Santina CC, et al. Diuretic treatment for Ménière's disease: A review of current practices and outcomes. *Otology & Neurotology*, 2005;26(5): 795-802.
5. Wilson K, & Chen L. (2020). Efficacy of diuretics versus cinnarizine and dimenhydrinate in treating Ménière's disease: A meta-analysis. *Hearing Research.* 2019;389: 107877. <https://doi.org/10.1016/j.heares.2020.107877>.
6. Acharya A, Singh M, Shrestha A. First Line Treatment of Meniere's Disease. *J Lumbini Med Coll.* 30Dec.2016 [cited 6Aug.2024];4(2):68 -71. Available from: <https://jlmc.edu.np/index.php/JLMC/article/view/93>.