Clinical Value of VEMP in assessing the stage and predicting the hearing results in Ménière’s Disease

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ABSTRACT

Objective: Our goal was to find clinical value of cervical VEMP in Ménière’s disease (MD) assessing its stage and predicting hearing outcome. Methods: The amplitude, peak latency and interaural amplitude difference ratio (IAD ratio) was obtained using cervical VEMP. The VEMP results of MD were compared with normal subjects and MD stages were compared with IAD ratio. Finally, the hearing changes were analyzed according to their VEMP results.

Results: In clinically definite unilateral MD (n=41), the prevalence of cervical VEMP abnormality in IAD ratio was 34.1%. Compared with normal subject (n=33), the VEMP profile showed significantly lower amplitude and similar latency.

Ménière’s Disease (MD)

• An idiopathic syndrome characterized by recurrent episodic vertigo, fluctuating hearing loss, aural fullness and tinnitus
• Hydrops and dilatation of endolymphatic spaces of both the hearing and balance
• Mostly common cochlea, and the saccule is the 2nd most frequent site

Vestibular Evoked Myogenic Potential (VEMP)

• Currently, irreversible damage from MD is measured solely on the basis of hearing impairment. But in the conventional stage system, intact vestibular function is usually evident in late stage MD.
• One possible hypothesis: vestibular sensory cells are relatively resistant to pressure compared with cochlear hair cells
• Another possible hypothesis: the caloric test cannot reflect vestibular loss in MD

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INTRODUCTION

METHODS AND MATERIALS

RESULTS

A retrospective analysis


Settings : Tertiary care hospital

Subjects : Patients diagnosed as unilateral, definite Ménière’s disease (N=41)
- 18 men, 23 women / mean age 48.8 years (range, 18-67 yrs)
- All the patients were followed up for more than 6 months.

Interventions

All the patients had received a hearing test and simultaneous c-VEMP.

Follow-up hearing test was performed at least 6 months from the initial test.

Cervical VEMP was performed using Navigator Pro (Bio-Logic Sytems, Mundelken, IL, USA).

Main Outcome measures

• The stages of MD (according to hearing loss) were compared with IAD ratio of VEMP
• We also analyzed hearing aggravation according to the VEMP results

(VEMP) P13-N23 potentials : peak to peak amplitude (µV)
The modified formula to measure relative response of lesion side ear in MD patients

(VEMP) (P13-N23 potentials : peak to peak amplitude (µV))

IAD ratio = {((Contralateral side ear amplitude - Lesion side ear amplitude)/(Contralateral side ear amplitude + Lesion side ear amplitude))} x 100%

IAD ratio of MD patients: 100.16 ± 29.77% and it was significantly larger than stage I and II patients (P =0.04).

Conclusion:
The modified formula to measure relative response of lesion side ear in MD patients.

We classified the patients into two groups based on the AAO-HNS staging system. Group I (N=24) included stage I and II, group II (N=17) included stage III and IV. We assessed if the VEMP results could reflect current staging system.

CONCLUSIONS

• We confirmed the clinical usefulness of VEMP in MD patients.
• VEMP IAD ratio can play an important role in determining disease stage, especially in hearing preserved early stage MD patients.
• It is noteworthy that patients with abnormal VEMP IAD ratio may have a worse hearing prognosis.
• Therefore, we suggest the VEMP test as a useful tool in hearing prediction in MD patients.

OBJECTIVES

To find diagnostic value of cervical VEMP in MD
(1) to confirm the role of VEMP as a new staging system
(2) to evaluate the clinical effectiveness of VEMP as a predictor of future hearing aggravation

REFERENCES

2. Hallpike CS, Cairns H. Observations on the pathology of Meniere’s syndrome: the modified formula to measure relative response of lesion side ear in MD patients. Group I (N=24) included stage I and II, group II (N=17) included stage III and IV. We assessed if the VEMP results could reflect current staging system.

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RESULTS

Fig. 1 The peak to peak amplitude of VEMP.

Fig. 2 The latency of P13 and N23 potentials.

Fig. 3 The interaural amplitude difference (IAD) ratio of VEMP.

Fig. 4 The staging of Ménière’s disease using VEMP.

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