An Analysis of Caloric Eye Speeds in Vestibular Migraine

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ABSTRACT
Objective: Investigate the utility of caloric testing and videonystagmography in the dizzy patient as it may relate to vestibular migraine. Study design: Retrospective cohort. Setting: Tertiary referral center in an ambulatory setting. Patients: 28 adult patients with a complaint of dizziness presented to a combined dizzy clinic and completed a migraine questionnaire in addition to caloric testing. Intervention: Migraine questionnaire administered in addition to caloric testing already indicated for dizzy patients. Main outcome measures: Responses to migraine questionnaire and nystagmus sum frequency (eye speeds) from caloric testing. Results: After exclusion criteria, 28 patients were included in the analysis. 13 patients responded to ≥2 of the first three questions on the migraine questionnaire (migraine group) were compared with 15 patients that answered ‘yes’ to less than two questions (non-migraine group). A trend was observed in which migraine patients were more likely to have a sum nystagmus frequency less than 50 than those in the non-migraine population. 7.7% (1/13) vs. 26.6% (4/15) respectively (p=0.33). Conclusions: Nystagmus sum frequency observed between the migraine and non-migraine group was remarkably similar. The migraine group was observed to have a trend sum frequency less than 50 four times less than the non-migraine group. Further investigation is necessary to determine the utility and reproducibility of these findings.

INTRODUCTION
Migraine is the underlying pathology of a significant number of patients seen for dizziness by Otolaryngologists. Unfortunately, clear diagnostic criteria for vestibular migraine, also known as migraine associated vertigo, are lacking, and the disorder is not recognized as a variant of migraine by the International Headache Society. Neuhauser and others have attempted to apply diagnostic criteria to vestibular migraine, but a clear consensus is lacking and no objective test for vestibular migraine exists. Clinically, many vestibular migraine patients seem to have a sensitivity to complex and difficult visual surroundings and to motion in their environment, such as walking down grocery store aisles, scrolling on a computer screen, or riding in the back seat of a car. This study sought to determine if such symptoms, suggestive of a global sensitivity to motion, would also translate to sensitivity to caloric testing resulting in higher total eye speeds in patients with dizziness and migraine.

METHODS
After IRB approval, retrospective chart review was performed for patients presenting to a combined dizzy clinic for evaluation. All patients were included in the study for whom complete information was available including: survey results, caloric testing results, audiogram, and patient notes documenting hearing status or evidence of Meniere’s disease. Mean age was 54 range (27-79). Patients were given a survey asking questions regarding migraine symptoms (see figure 1). These questions have been previously shown to have a sensitivity of 0.81 (95% CI, 0.77 to 0.85), and a specificity of 0.75 (95% CI, 0.64 to 0.84) when ≥2 of the first 3 questions on the survey were answered to the affirmative. The patients’ responses were reviewed in person and confirmed or clarified. All patients subsequently underwent caloric testing with videonystagmography (VNG). Patients were later separated into groups based on their questionnaire responses i.e. ≥2 questions to the affirmative of the first three survey questions were placed in the migraine group, others were placed in the non-migraine group. The caloric testing results were then compared between the two groups.

DISCUSSION
In this study, patients with dizziness and migraine as identified by a questionnaire had similar caloric responses to patients without migraine. The trends at the margins - very low and very high total eye speed occurring rarely in migraine patients - is intriguing, but of unclear significance. The response to caloric testing depends on several factors including innate function of the lateral semicircular canal and anatomic variables such as the distance between the external auditory canal and the lateral semicircular canal, and the thickness of the intervening skin and bone. Such anatomic variation may outweigh functional differences in a study of small sample size, such as the present study. The control group in this study was patients being seen for dizziness but without migraine and it is possible that some of these control patients also had migraine as assessed by other criteria. Given the high prevalence of migraine and dizziness, further clarification of this disease entity is warranted.

REFERENCES