Revisiting the Use of ABR in the Diagnosis of Vestibular Schwannomas: A Meta-Analytic Approach

Paul D. Koors, BS1; Leroy R. Thacker, PhD2; Daniel H. Coelho, MD1
1Department of Otolaryngology – Head & Neck Surgery
2Department of Biostatistics
Virginia Commonwealth University School of Medicine, Richmond, VA USA

ABSTRACT

Objective: The aim of this study is to evaluate the current role of auditory brainstem responses (ABR) in the diagnosis of vestibular schwannomas (VS), and the ABR soon became the initial diagnostic test of choice in patients suspected of having VS. However, with the advent of contrast-enhanced MRI in the late 1980s, the usefulness of the diagnostic role of ABR in VS was called into question, and MRI became the new gold standard. ABR was shown to be less sensitive in assessing small tumors from MRI. As a result, ABR became the initial screening test for suspected CPA tumors and ABR test of favor1-3.

INTRODUCTION

In 1977, Sakas and Brackmann introduced the Auditory Brainstem Response (ABR) as a useful diagnostic tool for detecting vestibular Schwannomas (VS), and the ABR soon became the initial diagnostic test of choice in patients suspected of having VS. However, with the advent of contrast-enhanced MRI in the late 1980s, the usefulness of the diagnostic role of ABR in VS was called into question, and MRI became the new gold standard. ABR was shown to be less sensitive in assessing small tumors from MRI. As a result, ABR became the initial screening test for suspected CPA tumors and ABR test of favor1-3.

METHODS: Searches were conducted in PubMed, CINAHL, Biosis, Cochrane, Cambridge Scientific Abstracts, Web of Science, and EMBASE for English-language studies that met search criteria. The references of pertinent studies were also examined, and hand searches were performed in relevant text and journals. The following search terms (Table 1) were used in all possible MEDLINE combinations to identify relevant studies.

RESULTS

623 studies were identified from which 43 meta-analysis for the introduction and widespread use of MRIs. Current trends towards more conservative treatment paradigms, including observation (wait-and-scan), are based largely on improved understanding of the natural course of progression of these benign growths. This, coupled with certain financial realities of limited healthcare resources, has prompted many practitioners to question the necessity of MRI for every patient with asymmetric sensorineural hearing loss (by any definition) and therefore may not have ABR or MRI ordered at all. An ABR test of favor in 2432 patients was 82.6% (95% CI 80.5-84.2, P=0.0000). Due to the overwhelming homogeneity of the results, there were no significant differences between fixed-effect and random-effect modeling.

DISCUSSION

Currently, the role of the ABR in the workup of potential retrocochlear pathology remains controversial. Some authors argue that the ABR has not kept up with current management, and thus should not be used as initial screening test when there is suspicion of VS. Other authors argue that the ABR is still necessary for the diagnosis of VS. The cost effectiveness of ABR testing for VS is unknown, but the percentage of patients presenting with abnormal ABR or MRI do not have surgically confirmed VS, thereby causing potential selection bias. In ... asymmetric hearing loss (by any definition) actually have VS. Furthermore, many patients with VS may have a completely

CONCLUSIONS

This meta-analysis confirms that ABR can be a powerful tool in the diagnosis of VS. Yet, how to workup of patients with potential retrocochlear pathology should not be based solely on audiogram, but...