

ORIGINAL ARTICLE

Automated Auditory Brainstem Response: A Proposal for an Initial Test for Healthy Newborn Hearing Screening with a Focus on the Test Time

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Objective: Some researchers recommend the use of Automated Auditory Brainstem Response as an initial screening test for healthy newborns due to its lower false-positive and referral rates, high specificity, and also its' ability to diagnose auditory neuropathy spectrum disorder combination with Transient Evoked Otoacoustic Emissions test. On the other hand, the test time can be a disadvantage. With technological advancements, a new generation Automated Auditory Brainstem Response has been developed which is faster. The new design of the Automated Auditory Brainstem Response is designed with a coupler that does not contain disposable electrodes is available at an acceptable cost. The aim of this study was comparing the new generation's Automated Auditory Brainstem Response and Transient Evoked Otoacoustic Emissions test by regarding to their test times. The results were then compared with those in previously published literature.

Methods: Two hundred and sixty healthy infants were included in the study. The hearing screening of all infants was performed using Transient Evoked Otoacoustic Emissions and Automated Auditory Brainstem Response test devices with new, improved technology. The Ero-ScanTM (Maico, Berlin, Germany) test system was used for the Transient Evoked Otoacoustic Emissions, and the newly designed Maico MB11 BERAphone (Maico-Berlin, Germany) Auditory Brainstem Response screening device with three electrodes in one cap was used for the Automated Auditory Brainstem Response test.

Results: Mean age of babies was 60.7±51.3 hours, and age range was 4hours-312hours. The test times for the Transient Evoked Otoacoustic Emissions were 13.68±9.2s and 14.04±9.4s, and for the Automated Auditory Brainstem Response, they were 39.15±22.2s and 45.25±23.9s for the right and left ears respectively.

Conclusions: Although the Automated Auditory Brainstem Response test time is statistically longer than the Transient Evoked Otoacoustic Emissions, the amount of time it takes has been significantly shortened by the new technology. This finding enhances the value of the new generation Automated Auditory Brainstem Response technology usage as an initial test for newborn hearing screening.

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Introduction

The transient (automated) evoked otoacoustic emission (TEOAE) and automated auditory brainstem response (AABR) screening methods are used for newborn hearing screening^[1-8]. While the TEOAE is used for the measurement of outer hair cell function, the AABR is used for the measurement of the inner ear, auditory nerve, and brainstem responses^[2].

Both screening methods have certain advantages and disadvantages. The target population (healthy infants or infants in the intensive care unit), test time, basic materials, and cost are important factors to be considered in choosing a newborn hearing test^[2,4,9]. Since the TEOAE test method does not require electrodes and its test time is shorter than the AABR test, it has been suggested as the initial screening test for healthy newborns. The AABR has only been

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