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Auditory Brainstem Response Results in Individuals with Autism Spectrum Disorder and Delayed Speech Development

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Auditory brainstem response (ABR) testing is a well-established diagnostic tool used to assess the integrity and functionality of the auditory pathways from the ear to the brainstem. In recent years, it has garnered attention as a potential diagnostic marker in individuals with Autism Spectrum Disorder (ASD) and delayed speech development. Given the increasing prevalence of ASD globally, the early detection and understanding of its underlying neurophysiological markers are critical. This article delves into the auditory brainstem response results in individuals with ASD, particularly focusing on those who also exhibit delayed speech development, and explores the implications for clinical practice and further research.

Keywords: Auditory Brainstem Response (ABR); Autism Spectrum Disorder (ASD); Delayed Speech Development; Auditory Processing; Brainstem Dysfunction

Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by impairments in social interaction, communication, and a restricted range of interests or repetitive behaviors [1,2]. Delayed speech and language development is a common feature among individuals with ASD, often prompting early intervention. While the etiology of ASD remains largely elusive, research has increasingly explored potential auditory processing abnormalities as part of the disorder's multifaceted presentation [3,4].

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02-Sep-2024, Manuscript No: jspt-24-147005; 05-Sep-2024, PreQC No. jspt-24-147005 (PQ); 18-Sep-2024, QC No- jspt-24-147005; 25-Sep-2024, Manuscript No: jspt-24-147005 (R); 30-Sep-2024, DOI: 10.4172/2472-5005.1000261

Ming W (2024) Auditory Brainstem Response Results in Individuals with Autism Spectrum Disorder and Delayed Speech Development. J Speech Pathol Ther 9: 261.

speech and language delays observed in this population.

R d c d a a d : In some cases, reduced wave amplitudes have been reported, particularly in wave V. Reduced amplitudes may re ect diminished neural synchrony in the auditory brainstem, which could contribute to the auditory processing di culties experienced by individuals with ASD.

I ca d a d c d ASD

e presence of ABR abnormalities in individuals with ASD, particularly those with delayed speech development, suggests that auditory brainstem dysfunction may play a role in the speech and language de cits commonly observed in this population. Delayed or abnormal auditory processing at the brainstem level could impair the ability to accurately perceive and discriminate speech sounds, leading to delays in phonological development, speech production, and ultimately, verbal communication. Given that auditory input is critical for speech and language acquisition, disruptions in the auditory pathway could have cascading e ects on speech development. e brainstem's role in encoding temporal aspects of sound, such as timing and rhythm, is particularly relevant for speech perception. Abnormal ABR ndings in ASD may re ect di culties in processing these temporal aspects of auditory stimuli, contributing to the challenges individuals with ASD face in understanding and producing language.