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Brain Waves and Connectivity of Autism Spectrum Disorders

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Abstract

This research reports the brain waave pattern of individuals with ASD and to pinpoint the anomalies of ASD and its difference with the normal group. The findings revealed a general disruption in the overall connectivity of the different lobes known as hyper or hypo connectivity with excessive presence of slow wave (delta) at the frontal lobe and deficiency of beta in most of the brain regions. Other anomalies includes low alpha at the sensory motor regions, excess alpha in the left hemisphere and excess theta in the right frontal region. These anomalies explain the associated problem in attention, anxiety and social behaviors of ASD.

Peer-review under responsibility of the Organizing Committee of ICEEPSY 2014.

Keywords: Autism spectrum Disorders, Q-EEG, Brain wave

1. Introduction

The Quantitative Electroencephalogram (QEEG) is a leading tool in the evaluation of autistic spectrum disorders (ASD) [1] It is noninvasive and the most helpful in identifying the areas of unique variability in the brains of children or individuals with ASD. The EEG is a collection of electrical activity produces at the cortex of the human brain that can then be recorded and measured. The brain maps or qEEG Maps are collected using 19 electrodes based on the International 10/20 system [2](Jasper, 1958). QEEG maps are quantitative analyses of EEG characteristics of frequency, amplitude and coherence during various conditions or tasks.For example, by looking at the quantitative electroencephalogram (qEEG) *alone,* Robert Coben and his colleagues [3] (2008) have been able to distinguish autistic children from neurotypical children with a success rate of 88%. It is an assessment instrument to measure (quantify) the electrical activity summation in a given region of the brain to localize the area of dysfunction. Such regions and aspects of dysfunctional neurophysiology may then be targeted specifically to decide on the individualized specific training protocols applied in EEG biofeedback or known as Neurofeedback (NFT) training. A psychologist or neurofeedback practitioner could easily reach wrong conclusions by obtaining a description of symptoms and decide by the application of an initial interview and series of clinical questions if the brain is in the specific state of performance and therefore train the specific frequencies to acquire peak performance. There should be an increasing dialogue between the professionals from various disciplines in cognitive science, more neurologists may be interested in psychological processes and more psychologists searching for an "organic"

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