EFFECT ON ACTIVITY AND PARTICIPATION IN A CHILD WITH CEREBRAL PALSY USING EEG NEUROFEEDBACK & THE SYNPHNE PROTOCOL IN SUCCESSION

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Introduction

- Cerebral palsy (CP) affects body movement, muscle control, coordination, tone, reflex, posture and balance and is a leading cause of physical disability. The overwhelming physical manifestations of CP often conceal the associated cognitive impairments.
- EEG Neurofeedback Training (EEG NFT) - a physiological method that uses EEG technology to reflect electrical activity from the cortex of the brain. It is based on operant conditioning principles; whereby individuals learn to self-regulate their brain waves (Hammond, 2011).
- SynPhNe - the Automated Synergistic Physio-Neuro Rehabilitation platform integrates the signals from the brain and muscles and assesses the state of readiness and uses an audio-visual interface to guide the person through a sequence of actions he/she may wish to practice.

Methods

- Aim - to explore the effectiveness of EEG NFT and SynPhNe protocol in CP. A single case study design was adopted.
- Master I.J., 6 year old male, born of a full term caesarean delivery with neonatal jaundice had normal development till 8 months of age but could not attain sitting milestone. An MRI revealed bilateral focal abnormalities in the thalamus and internal capsules-most likely sequelae of perinatal hypoxic ischaemic encephalopathy and IQ assessment revealed a score of 86. The child was unable to write or grasp objects with dominant right hand.

Results

- Neurological and adaptive functioning assessment at pre and post intervention assessment revealed significant improvements in daily activities.
- Squinuous, a battery of combined brain-muscle biofeedback interfaces such as EEG NFT and SynPhNe can be a winning shot in rehabilitation.

Conclusion

- Improvements were noted in attention for a task, spontaneous expression of needs and emotions, self-awareness and social skills. The child had improved performance in intelligence, writing, pronation/supination, fingers extension, hand use, muscle power and reported higher independence.
- Cerebral Palsy affects young children and stunts their physical and cognitive growth. However, the present study elucidates that technology interfaces such as EEG NFT and SynPhNe can be a promising combination to help CP children gain improved cognition, activity and participation.

Bibliography