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Poster Presentation Abstracts

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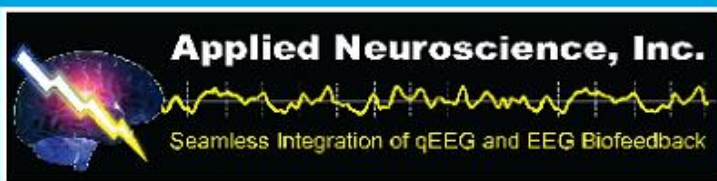
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POSTER PRESENTATION ABSTRACTS

Extended Follow-Up of Peniston Protocol Results with Chemical Dependency

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Introduction

This study represents one of the earliest clinical replications of the Peniston EEG biofeedback protocol for treating chemical dependency. Peniston and Kulkosky (1989, 1990) demonstrated the effectiveness of using EEG biofeedback techniques to treat alcoholism with inpatient veterans by documenting significant improvements for treated subjects in levels of depression, psychopathology, serum beta endorphins, and abstinence rates.

Method

The present study was a clinical trial using 16 chemically dependent subjects treated in a university-based outpatient clinic between 1992 and 1997. Ten of these subjects were probationers classified as high risk for re-arrest. Subjects completed an average of eight temperature and/or SMR EEG biofeedback sessions followed by an average of 31 alpha-theta EEG biofeedback sessions. Treatment effects were assessed using pre/post-treatment psychometric data (BDI, MMPI-2) and long-term follow-up of abstinence and re-arrest rates. The re-arrest rates for the probation subjects was compared to an equivalent probation sample (n = 24) that did not receive EEG biofeedback.

Results

Pre-treatment BDI scores were indicative of mild/moderate depression, but post-treatment scores were significantly reduced, to within the normal range. Substantial differences were noted on several MMPI-2 scales between testing periods including Hs, D, Pd, Pt, Sc, Ma, and Si, suggesting less psychopathology following treatment. Long-term (74 to 98 months) follow-up that included collateral informants indicated that 81.3% (n = 13) of the subjects

were abstinent. Re-arrest rates and probation revocations for the probationer subgroup in this study were lower than those for their comparison group (79.15% vs. 40%).

Conclusion

The results of this 74- to 98-month follow-up of subjects treated for chemical dependency with EEG biofeedback are consistent with the five- and 10-year follow-up data Peniston obtained on his original study sample. These results attest to the benefits and robust nature of this form of treatment, even with subjects from the criminal justice population. Ideally, future studies will include random assignment, control group(s), and larger numbers of subjects.

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Parametric and Non-Parametric Analysis Methods

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Introduction

Quantitative electroencephalography (qEEG) as a tool for the diagnosis of neurological and psychiatric disorders is receiving increased interest. While qEEG analysis is restricted to the scalp, the recent development of electromagnetic tomographies (ET) allows the study of the electrical activity of cortical structures. Electrical measures of a patient can be compared to a normative database derived on a large sample of healthy individuals. The deviance from the database's norms provides a probabilistic measure of the likelihood that the patient's electrical activity reflects normal brain functioning.

Method

The focus of this study is the method for estimating such deviance. The traditional method based on z-scores ("parametric") is reviewed and a new

method based on percentiles (“non-parametric”) is proposed. The parametric and the non-parametric methods are compared using simulated data. The accuracy of both methods is assessed as a function of normative sample size and gaussianity for three different alpha levels.

Results

Results suggest that the performance of the parametric method is unaffected by sample size, given that the sample size is large enough ($N > 100$), but that non-gaussianity jeopardizes accuracy even if the normative distribution is close to gaussianity. On the contrary the performance of the non-parametric method is unaffected by non-gaussianity, but is a function of sample size only. It is shown that with $N > 160$, the non-parametric method can always be considered preferable.

Discussion

Results will be discussed taking into consideration technical issues related to the peculiar nature of qEEG and ET data. It will be suggested that the sample size is the only constant across EEG frequency bands, measurement locations, and kind of quantitative measures. As a consequence, for a given database, the error rate of the non-parametric database is homogeneous; however the same is not true for the parametric method.

Case Study: Adverse Effects of Alpha-Theta Training for Anxiety/Sleep Disturbance

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Introduction

A 54-year old sought treatment for chronic severe anxiety, sleep disturbance and strong feelings of fatigue in the afternoon. The fatigue has been present only since completing approximately 30 sessions of Alpha-Theta training three years previously. He reported that the EEG neurofeedback had not been helpful for either the anxiety or sleep disturbance.

Method

The patient underwent QEEG brain mapping to determine if deviations from normative data bases were present. On all six databases used, excessively

elevated Alpha was present in both eyes-open and eyes-closed conditions with maxima up to 2.94 standard deviations. The author's research on Generalized Anxiety Disorder (GAD) will be briefly presented demonstrating that excessively elevated Alpha is a common subtype of GAD, being present in 55% of cases.

Results

Excessively elevated Alpha is a common subtype of GAD and the "standard protocol" of increase training of Alpha can be potentially harmful.

Conclusion

It is important to obtain QEEG topographic brain maps to determine the subtype of a particular disorder and the unique abnormal patterns present and to individualize training accordingly.

Case Study: Severe Obsessive Compulsive Disorder Successfully Treated with Beta Down Training

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Introduction

Relatively little research has been conducted on the subtypes of Obsessive Compulsive Disorder (OCD) and their treatment with EEG neurofeedback. This woman's OCD was severe, chronic, and not responsive to psychopharmacological, psychotherapeutic, and cognitive/behavioral interventions, yet she made rapid improvements with EEG neurofeedback predominately based on Beta down training.

Method

A brief presentation of the author's ongoing research of OCD QEEG-based subtypes will be made. The patient's QEEG topographic brain maps based on several databases including NXLink and the Workstation LORETA QEEG analysis system will be presented and the EEG neurofeedback interventions discussed.

Results

Significant improvements were brought about whereby the patient was able to predictably and consistently leave her residence and return to a successful

professional practice. Later she was able to open her own independent consulting practice which had been an unattainable goal previously.

Conclusion

It is important to obtain QEEG topographic brain mapping data to be able to individualize EEG neurofeedback treatment interventions for optimal results.

Learning Disabilities Case Study: Elevated Beta Correlating with ADHD, Auditory Processing Disorder, Dyslexia, and Math Learning Disability

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Introduction

Research conducted by the author on ADHD, Math learning disability, dyslexia, and auditory processing disorder will be briefly summarized and a case study with all the above correlating with elevated Beta will be presented.

Method

The author is conducting ongoing research on the above disorders utilizing QEEG topographic brain maps. Abnormal findings of one standard deviation or more as compared to the New York University E. Roy John Normative Data Base was used as a cutoff for significance.

Result

The case study was unique in that although all of the above learning disabilities can individually be correlated with excessively elevated Beta, it was not common to find them all so clearly correlated with elevated Beta alone.

Conclusion

It is important to understand that learning disabilities can be associated not just with excessively elevated slow waves but with Beta as well. So called "standard protocols" based on symptoms rather than QEEG data need to be re-evaluated based on the tremendous variety of subtypes including excessive Beta.