

## EPV1624

**Exploring neurophysiological indices in psychiatric disorders: Fronto-central beta oscillations as a potential biomarker**

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**Introduction:** Historically, psychiatric disorders are studied according to a strictly behavioral approach taking into account the manifest symptomatology.

**Objectives:** The present work aims to deepen the investigation of neural substrates through the use of neurophysiological recording techniques in an attempt to identify biomarkers related to these pathologies. Investigating whether neurophysiological indices are able to predict the symptomatic improvement and socio-relational functioning of the sample in a transversal manner with respect to the diagnostic category and the symptomatic severity of the psychiatric disorder. Further research is necessary.

**Methods:** The subjects were evaluated through the scale that measures psychopathological severity (BPRS, PANSS), global functioning (HoNOS) and cognitive (MMSE, CDT). The users were categorized based on the diagnosis and divided into the two Clusters, taking into account the number of hospitalizations of each user during the current year. The following neurophysiological parameters were detected using the Rehacor-T device: electroencephalographic (frontocentral brain oscillations), electrocardiographic (heart rate and HRV) and skin conductance (EDA). For a total procedure duration of 10 minutes (6 minutes of rest, 4 minutes in which the Stroop Test task was performed). Statistical analyses (Random Forest Clustering, Logistic Regression, ANOVA) were performed with the Jasp software (JASP 0.17.3.0).

**Results:** 83 users hospitalized at the Psychiatric Unit of the M. Bufalini hospital in Cesena were recruited and categorized according to the clinical diagnosis. Using a Random Forest Clustering algorithm the population was divided into two different Clusters based on the extent of improvement, assessed based on the low or high number of hospitalizations in the last year. Cluster 1 includes people with a higher number of hospitalizations, while Cluster 2 includes those with a lower number. From logistic regression analyses, a single neuropsychophysiological parameter was identified that was able to predict the classification of users within the two Clusters, namely the Beta oscillations (13-30 Hz) recorded in the fronto-central position in the resting state with eyes closed (resting state). Greater power was recorded in the group of subjects who reported a significant improvement in the symptomatic picture (Cluster 2). The variable of sex was not relevant, while the diagnosis, in Cluster 2, a greater concentration of people with depressive disorder was found.

**Conclusions:** This work highlights how the fronto-central Beta oscillations recorded in the resting state with eyes closed can be a predictive index of the improvement of the psychopathological conditions of the sample. The remaining neurophysiological indices taken into consideration (delta, theta, alpha and beta oscillations, ECG, EDA), did not show the same predictive capacity.

**Disclosure of Interest:** None Declared

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**Neurophysiological indices as predictive factors of clinical improvement**

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**Introduction:** In recent years, scientific literature has focused on the study of neurophysiological indices, including parameters derived from electroencephalography (EEG), electrocardiography (ECG), and electrodermal activity (EDA), in order to identify potential biomarkers that could be useful in the assessment, monitoring, and prevention of psychiatric disorders.

**Objectives:** The aim of this work is to investigate whether some neurophysiological indices are able to predict the symptomatic improvement and the socio-relational functioning of people hospitalized in acute psychopathological conditions at the Psychiatric Unit of the Bufalini hospital in Cesena, in a transversal manner in regard to the diagnostic category and the symptomatic severity of the psychiatric disorder.

**Methods:** To assess treatment outcomes from both a psychopathological and functional perspective, the Health of the Nation Outcome Scales (HoNOS) and Brief Psychiatric Rating Scale (BPRS) were administered at the start and end of hospitalization. Neurophysiological parameters were measured using the Rehacor-T device, which recorded frontocentral cerebral oscillations in Delta, Theta, Alpha, and Beta frequency bands, as well as heart rate and skin conductance. Data collection involved two phases: initially, participants viewed a calming landscape with eyes open, followed by a phase with eyes closed where they aimed to maintain tranquility. The Stroop test was then conducted. Statistical analyses were performed using JASP software.

**Results:** The sample includes 112 patients (M = 57; F = 55), the average age of the participants is 44 years (SD = 16), while the average level of education is 11 years (SD = 3).

The Beta frequency band in the eyes closed condition and the Delta frequency band in the eyes open condition show a positive regression with the changes in the HoNOS scale scores, indicating that an increase in Beta and Delta oscillations corresponds to an improvement in socio-relational functioning.

A positive regression was found between Delta oscillations in the Stroop test phase and changes in BPRS scores, suggesting that an increase in oscillations corresponds to an improvement in clinical symptoms.

**Conclusions:** Although several autonomic abnormalities are known in psychiatric disorders, our results did not show any prognostic ability from the ECG and EDA indices recorded in the sample.

In conclusion, in line with what has already been demonstrated in the literature, it is possible to confirm that EEG indices can reflect the adaptive resources of the person affected by psychiatric disorders in terms of the possibility of responding to treatment.

Deepen the research in this field could lead to the identification of new and more specific biomarkers for the prevention, diagnosis and treatment of psychiatric disorders.

**Disclosure of Interest:** None Declared