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16th European Epilepsy Congress

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ABSTRACTS BOOK

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Oral Presentations

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Late Breaking In Person Poster Presentations

Results: In terms of network connectivity strength, significant differences between SBS and GSWD were observed across all frequency bands after FDR correction (all $p<0.05$). Regarding network topology, the clustering coefficient differed significantly in the δ, θ, α, and γ bands ($p<0.05$). Characteristic path length showed significant between-group differences in the δ, θ, β, and γ bands ($p<0.05$). Eccentricity was significantly different in the δ, θ, β, and γ bands ($p<0.05$), with a marginal difference observed in the α band. Overall, consistent differences in local connectivity properties and global network organisation were observed across most frequency bands, suggesting stable differences in network organisational patterns between the two types of epileptiform discharges.
Conclusion: SBS and GSWD show significant differences in brain network topology, characterised by enhanced local network organisation and superior global integration, respectively. These findings support a continuum model of epileptic discharges evolving from focal onset to widespread network involvement.

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Electroencephalographic Signs of Increased Neuronal Excitability in the Chronic Period of Blast-Induced Mild Traumatic Brain Injury

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Purpose: Blast-induced mild traumatic brain injury (mTBI) is a common combat-related injury of the central nervous system associated with persistent functional brain alterations. Electroencephalography (EEG) is a sensitive method for assessing brain functional status and may be useful for detecting early electrophysiological changes following blast injury.
The aim of the study was to evaluate EEG features in patients during the chronic phase of blast-induced mTBI and to identify electrophysiological signs of increased neuronal excitability.
Method: Sixty-six combatants aged 23–55 years in the chronic phase of blast-induced mild traumatic brain injury (6 months to 3 years after injury) and 15 healthy controls were enrolled in the study. EEG recordings were obtained during relaxed wakefulness using a 19-channel NeuroCom system (Ukraine), with electrodes placed according to the international 10–20 system. Functional tests included eye opening, photic stimulation, and hyperventilation. Both visual and spectral analyses of the EEG were performed. Spectral analysis was conducted on stationary, artifact-free resting-state EEG segments lasting 35–45 seconds.
Results: Patients with blast-induced mTBI demonstrated decreased relative alpha rhythm power along with increased beta, theta, and delta activity, predominantly in the frontotemporal regions. Reduced alpha rhythm frequency, altered topography, and decreased amplitude were observed. Low-frequency alpha rhythm (≤9.4 Hz) was detected in 47.0% of patients, alpha rhythm frequency instability greater than 1 Hz in 10.6%, impaired activation response in 69.7%, frontal intermittent rhythmic delta activity in 16.7%, and epileptiform patterns, including frontotemporal and frontal spikes in 28.7%, occipital spikes in 10.6%, and secondary generalised spike-and-wave discharges in 21.2% of patients.
Conclusion: EEG changes in the chronic period of blast-induced mTBI reflect impaired functional cortical activity, disorganisation of cortico-subcortical interactions, and dysfunction of nonspecific regulatory brain systems. The detected epileptiform patterns, impaired alpha rhythm reactivity, and signs of unstable thalamo-cortical regulation may indicate the development of increased neuronal excitability in the long-term period following blast injury.