Sleep seizure

In a study, Chiosa et al., aimed to estimate the alterations of brain networks and structural integrity linked to seizure occurrence during sleep and awake states.

Using a graph theory approach to magnetic resonance imaging-derived volumes of cortical and subcortical regions, they investigated the topological organization of structural networks in patients with sleep seizures (n = 13), patients with awake seizures (n = 12), and age- and sex-matched healthy controls (n = 10). Abnormalities in regional structural substrates (cortical volume/surface area, subcortical volumes) associated with sleep seizures and awake seizures were further analyzed.

Brain networks in patients with sleep seizures compared to patients with awake seizures displayed a more integrated structural organization coupled with greater networks stability. When compared to healthy controls, networks in both patients with sleep and awake seizures were analogously compromised, exhibiting a less integrated and preserved organization. Patients with sleep seizures in contrast to awake seizures had larger volumes of bilateral insula, superior temporal, and orbitofrontal cortices but lower volumes of left postcentral and right middle temporal cortices in comparison to healthy controls. Patients with awake seizures compared to healthy controls displayed reduced volumes mainly in frontal, temporal, and parietal regions of right hemisphere. Volumes of hippocampus, amygdala, caudate, pallidum, and putamen were larger in patients with sleep seizures than in patients with awake seizures.

Despite epileptogenesis, patients with sleep and awake seizures had distinct network and structural correlates across different epilepsy types. Identified regional cortical/subcortical abnormalities can endorse the pathophysiological alterations that induce seizures during the sleep or awake states ¹⁾.

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Chiosa V, Ciolac D, Groppa S, Koirala N, Pintea B, Vataman A, Winter Y, Gonzalez-Escamilla G, Muthuraman M, Groppa S. Large-scale network architecture and associated structural corticosubcortical abnormalities in patients with sleep/awake-related seizures. Sleep. 2019 Jan 31. doi: 10.1093/sleep/zsz006. [Epub ahead of print] PubMed PMID: 30753617.

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