Exploring Resting State fMRI & Functional Connectivity Patterns in Chronic Pain

Facial pain disorders pose a considerable health challenge, yet their neural mechanisms remain elusive. This study seeks to illuminate disparities in brain connectivity patterns between healthy controls and individuals afflicted with facial pain, leveraging resting-state functional magnetic resonance imaging (fMRI) data. The dataset, comprising 20 rs-fMRI healthy controls data and 56 chronic pain arthritis participants' data collected across two phases of a chronic pain study, was sourced from the OpenfMRI database with accession number ds000208. Pre-processed fMRI data from both cohorts were aligned to a common brain template for group-level comparisons. Employing Seed-based Correlation Analysis (SCA), we explored functional connectivity patterns among 64 regions of interest (ROIs) implicated in pain processing, as delineated by the Automated Anatomical Labeling (AAL) atlas, spanning the voxel space (64x116). Subsequently, a thorough statistical examination was conducted, employing a two-sample t-test with 10,000 bootstraps to ensure the robustness and reliability of our findings. To counteract the risk of false positives, we applied false discovery rate (FDR) correction. Our results reveal substantial alterations in brain connectivity networks associated with facial pain, shedding light on the intricate neural mechanisms underpinning this debilitating condition. These insights not only deepen our comprehension of facial pain pathophysiology but also hold promise for the development of targeted therapeutic interventions aimed at alleviating the suffering of affected individuals.