Article: EPA-1579
Topic: E08 - e-Poster Oral Session 08: Schizophrenia, Affective disorders, Addiction

CLASSIFYING SCHIZOPHRENIA USING JOINT MULTIVARIATE PATTERN RECOGNITION ANALYSIS OF BRAIN FUNCTION AND STRUCTURE

L. Kambeitz-Ilankovic[1], N. Koutsouleris[1], S. Von Saldern[1], P. Falkai[1], C. Cabral[1]

[1]Clinic for Psychiatry and Psychotherapy, Ludwig-Maximilians-University, Munich, Germany

Background: Previous studies have shown that structural brain changes are among the best-studied candidate markers for schizophrenia (SZ) along with global functional connectivity (FC) alterations of resting-state (RS) networks. Only few studies tried to combine these data domains to outperform unimodal pattern classification approaches. We aimed at distinguishing SZ patients from healthy controls (HC) at the single-subject level by applying multivariate pattern recognition analysis to both gray matter (GM) volume and FC measures.
Methods: The RS functional and structural MRI data from 74 HC and 71 patients with SZ were obtained from the publicly available COBRE database. The machine learning pipeline wrapped into repeated nested cross-validation was used to train a multi-modal diagnostic system and evaluate its generalization capacity in new subjects**.**
Results: Both functional and structural classifiers were able to distinguish between HC and SZ patients with similar accuracies. The RS classifier was showing a slightly higher accuracy (75%) comparing to GM volume classifier (74.4%). Ensemble-based data fusion outperformed pattern classification based on single MRI modalities by reaching 76.6% accuracy, as determined by cross-validation. Further analysis showed that RS classification was less sensitive to age-related effects across the life span than GM volume**.**
Discussion: Our findings suggest that age plays an important role in discriminating SZ patients from HC, but that RS is more robust towards age-differences compared to GM volume. Single neuroimaging modalities provide useful insight into brain function or structure, while multimodal fusion emphasizes the strength of each and provides higher accuracy in discriminating SZ patients from HC.

https://doi.org/10.1016/S0924-9338(14)78735-8 Published online by Cambridge University Press