DESCRIPTION OF A MULTIMODAL IMAGING TOOL (PET/MR/EEG) FOR EARLY SCHIZOPHRENIA DIAGNOSIS – TRIMAGE PROJECT

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Abstract

Schizophrenia is a severe mental disorder, characterized by profound disruptions in thinking, affecting language, perception, and the sense of self. Schizophrenia disorders manifest themselves early in life, affecting approximately 1% of the European adult population. This causes a high social and economic burden on European societies. In most of the cases, early diagnosis, can lead to effective treatment, and people who are affected can live a productive life and be integrated in society. Consequently, there is a strong need for an imaging tool that facilitates the diagnosis of schizophrenia early during development. The purpose of this study is to present the results and development of the European FP7-Health-2013: TRIMAGE project, which aims at building an original PET/MR/EEG imaging system for early diagnosis of brain disorders. The 1.5T brain-dedicated MRI scanner is already under operational testing procedures. For comparison reasons, a clinical trial was carried out in 25 subjects (13 healthy control and 12 schizophrenic patients) using an existing clinical MRI scanner. The PET system, with FOV=16.2cm and PET ring diameter of 24cm, is under the final stage of construction, while Monte Carlo simulations, using anthropomorphic computational models, were carried out in order to evaluate the PET system. Finally, the PET/MRI system will be a complete trimodal system since it will incorporate a commercially available state-of-the-art EEG system (32 channels) that has already been tested in the hybrid PET/MRI environment. The proposed system will be fully operational by the end of the project in December 2018.

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