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Brain Perfusion Characterizes First Episode of Psychosis Patients in Respect to Healthy Controls.

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Introduction

Vascular changes in the brain are relevant in schizophrenia [e.g. 1] and in bipolar disorder [2]. The study of first episode psychosis (FEP) allows the analysis of brain morphology and function without confounds due to chronicity.

Objectives

To characterize brain perfusion in FEP.

Aims:

To see if FEP exhibit modified perfusion in respect to healthy controls (HC), and identify the most affected brain areas.

Methods

We acquired T1 and DSC images of 35 FEP patients (45 +/- 10 years old) and 35 HC (42 +/- 8), using Gadolinium (0.1 mmol/Kg). We computed cerebral blood volume (CBV), cerebral blood flow (CBF) and mean transit time (MTT) [3] in the whole brain and in left and right frontal, parietal, temporal and occipital lobes, insula, caudate and cerebellum

Results

Mean values of all quantities resulted lower in patients, up to 12% for CBV in right frontal lobe, 11% for CBF in left cerebellum and 16% for MTT in right frontal lobe. We used a support vector machine (SVM) to classify subjects on the basis of the histogram of perfusion values. We found that the classification reached accuracies over 80%, especially in the frontal brain areas.

Conclusions

FEP show altered perfusion parameters, which allow automatic classification with good accuracy, showing that brain vascular characteristics can be considered as marker of psychosis.

[1] Peruzzo et al (2011). J Neural Transm, 118, 4:563-70.

[2] Agarwal et al (2008). J Affect Disord, 110, 1-2:106-14.

[3] Ostergaard et al (1996). Magn Reson Med, 36, 5:715-25.