

P03-194

THE POTENTIAL OF SUPPORT VECTOR MACHINE AS THE DIAGNOSTIC TOOL FOR SCHIZOPHRENIA: A SYSTEMATIC LITERATURE REVIEW OF NEUROIMAGING STUDIES

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Introduction: Schizophrenia is a relatively common chronic psychotic mental illness, which usually continues throughout life. Current diagnosis is based on a set of psychiatrist-applied diagnostic criteria. There can be considerable differences between diagnostic classification based upon either the set of criteria used, or the individual who applies the criteria. For this reason, the development of an objective test to inform the diagnosis could be highly beneficial.

Objectives: To assess the use of Support Vector Machine (SVM) as a potential diagnostic tool for schizophrenia, with a particular focus on the application of SVM to Magnetic Resonance Imaging (MRI) data.

Aims: To show the use of SVM on MRI data to be a potentially viable diagnostic test.

Method: A systematic literature search was carried out using the PubMed database, Web of Knowledge as well as Google Scholar. This search was conducted using the terms 'Schizophrenia', 'SVM', 'Support Vector Machine' and 'MRI/fMRI'. This was followed by the application of criteria relating to relevance to the desired search topic (as assessed by the author). Ten publications were identified as relevant.

Results: Results showed strong evidence that the application of SVM to MRI data can reliably differentiate between patients with schizophrenia and healthy controls.

Conclusions: The results indicate that using SVM to analyse MRI data can be reliably used to identify schizophrenia, although there is some variability between the results produced.

The potential of SVM in application to fMRI (as opposed to structural MRI) data is yet to be fully explored.