Introduction

• The "jumping to conclusions" (JTC) bias can be observed where patients with schizophrenia make decisions faster compared to healthy subjects in tasks requiring integration of information to respond [1,2].

• Hypersalience is consistent with the aberrant salience account of psychosis, where dysregulated dopamine transmission in the ventral striatal dopamine pathway in schizophrenia may result in context inappropriate salience attributions, exaggerating the importance of various associations [3].

• Evidence-hypothesis (EVH) matches are observed when the available evidence matches the presented hypothesis [4], and patients with schizophrenia and delusions may exaggerate the importance of the available evidence.

• The JTC bias is explained by the hypersalience of evidence-hypothesis matches (EVH matches) account of delusions [4].

Objective

This study aims to assess the functional brain networks involved in EVH matches in patients with schizophrenia and delusional symptoms during a probabilistic reasoning task known as the FISH task.

Methods

• Patients with schizophrenia (delusion n=29, non-delusional n=41) and healthy subjects (n=41) completed a probabilistic reasoning task in the fMRI scanner.

• Data was analyzed using Constrained Principal Component Analysis for fMRI (fMRI-CPCA) to identify functional brain networks elicited by the task and experimental manipulations of task conditions [6].

Results

• Four functional brain networks were extracted from the fMRI-CPCA analysis.

• The below network (Fig. 1) was involved in visual attention (external attention and default mode network), and revealed a significant difference between the three groups based on strength of evidence (i.e. strong vs. weak) (Fig 2).

• Visual attention revealed stronger activation for the weak relative to the strong match condition for healthy controls and non-delusional patients.

• This difference between strong and weak conditions was not observed in the delusional group for this network.

Discussion

• The functional brain network involved in external attention revealed hypersalience in the weak match condition for the delusional patients, as it required the same (low) attentional demands as the strong match condition.

• This emphasizes the importance of hypersalience of matches, even in the weak condition, and the JTC bias.

• Further research can investigate how treatment for delusions and schizophrenia may affect the brain network responsible for volitional attention to external representations.

• Understanding the cognitive underpinnings of patients' decision-making is important for further research in therapeutic interventions for patients with schizophrenia experiencing delusions, particularly methods involving electronic stimulation to modulate brain networks.

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References

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