Schizophrenia and frontal cortex: Where does it fail?
P. Salgado-Pineda, A. Caclin, I. Baeza, C. Junqué, M. Bernardo, O. Blin, P. Fonlupt

Presented by Caitlin McKall

Overview
- Schizophrenia diagnosis
- Introduction
- Experiment
- Results
- Strengths & Limitations
- Future research

Schizophrenia
Two+ present over 1 month:
- Delusions
- Hallucinations
- Disorganized Speech
- Catatonic or Disorganized Behaviour
- Negative Symptoms (poverty of speech, affect or goal directed behaviour)

- John Nash

Introduction
- Abnormal connectivity between frontal lobe & other structures
- Modified activity within frontal lobe
- Negative correlation between dorsolateral PFC (attention outward) & medial PFC (attention inward) vital for attentional control
- Difficulty prioritizing, processing & responding to information
- fMRI of Continuous Performance Task to compare this connectivity pattern in healthy vs. schizophrenic subjects

Participants
Schizophrenic Subjects
- 7 men & 7 women
- Schizophrenia Diagnosis
- Hospital Clinic of Barcelona
- 25±4 years old
- 11 paranoid type, 1 residual, 2 undifferentiated
- All on neuroleptic medication

Control Subjects
- No mental illness of any type
- Matched to patients by handedness, age, sex & highest level of education of parent
Method

1.5T fMRI scanner
2 control blocks alternating with 2 Continuous Performance Tasks (CPT) blocks
CPT: Respond when the same digit appeared twice in succession
Control: Respond when the number 1 appears

Results

Green: dorsolateral prefrontal, inferior frontal & preSMA
Red: medial frontal, premotor & inferior/posterior inferior frontal
Blue Arrow: inferior/posterior inferior frontal region
Red Arrow: right dorsolateral area

Main Findings

Less negative correlation between DLPFC (attention directed externally) & MFC (self-referential activity)

Absant connections: • Right DLC
• Inferior/posterior inferior frontal region

Discussion

Impaired relations of the DLPFC (external) with such structures as the right DLC (external) & MFC (self-referential) may be related to:
• impairments in sustained attention
• distorted perceptions of reality (leading to hallucinations)
• false beliefs (leading to delusions)

Limitations

• Patterns the effect of the disease or the drug treatment?
• No measured occurrence of attention deficit or distortion of reality during MRI scan
• Different schizophrenic type diagnoses participating
• Small number of participants

Strengths

• Creative approach to study balance between external vs. internal attention
• Healthy subjects highly matched to schizophrenic patients

Future Directions

The effect of neuroleptic drugs on activities in the frontal cortex in schizophrenic and healthy subjects:
Do they suppress activity in the right DLC, activity in the inferior/posterior inferior frontal region, or any negative correlations between the DLFC and MFC?
Questions?