Functional Mapping of Dynamic Happy and Fearful Facial Expressions in Young Adults with Familial Risk for Psychosis (FR)

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Background

Psychotic disorders and their prodromal states have been connected to impaired social functioning. We compared the brain activity between young adults with familial risk for psychosis (FR) and matched controls during visual exposure to emotional facial expression.

Methods

51 FR and 52 control subjects were drawn from the Northern Finland 1986 Birth Cohort (Oulu Brain and Mind Study). Participants underwent functional MRI (fMRI) using visual presentation of dynamic happy and fearful facial expressions. FMRI data were processed to produce maps of blood oxygen level dependent (BOLD) responses for happy and fearful facial expressions, which were then compared between groups.

Results

FR subjects had increased BOLD response in the superior frontal gyrus and supplementary motor area and reduced negative BOLD response in the paracingulate cortex during happy facial expressions. The FR group also showed a statistically significant linear correlation between mean amygdala BOLD response and facial expression recognition. PPI showed that there was a significant negative interaction between the amygdala and the dorsolateral prefrontal cortex (dLPFC) and superior temporal gyrus in FR subjects.

Conclusions

Our results indicate abnormal function of PFC in FR subjects. This was also suggested by PPI, as the dLPFC showed decreased functional connectivity with the amygdala in the FR group. This may indicate that in FR subjects the amygdala have to take a greater role in emotion recognition and social functioning. This inference was supported by our discovery of statistically significant correlations between the amygdala BOLD response and emotion recognition in the FR group but not in controls.