

Effects of Oxytocin on Neural Response to Facial Emotion Recognition in Schizophrenia

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Abstract : Objective: Impaired facial emotion recognition is widely reported in schizophrenia. Neuropeptide oxytocin is known to modulate brain regions involved in facial emotion recognition, namely amygdala, in healthy volunteers. However, its effect on facial emotion recognition deficits seen in schizophrenia is not well explored. In this study, we examined the effect of intranasal OXT on processing facial emotions and its neural correlates in patients with schizophrenia. Method: 12 male patients (age= 31.08 ± 7.61 years, education= 14.50 ± 2.20 years) participated in this single-blind, counterbalanced functional magnetic resonance imaging (fMRI) study. All participants underwent three fMRI scans; one at baseline, one each after single dose 24IU intranasal OXT and intranasal placebo. The order of administration of OXT and placebo were counterbalanced and subject was blind to the drug administered. Participants performed a facial emotion recognition task presented in a block design with six alternating blocks of faces and shapes. The faces depicted happy, angry or fearful emotions. The images were preprocessed and analyzed using SPM 12. First level contrasts comparing recognition of emotions and shapes were modelled at individual subject level. A group level analysis was performed using the contrasts generated at the first level to compare the effects of intranasal OXT and placebo. The results were thresholded at uncorrected $p < 0.001$ with a cluster size of 6 voxels. Neuropeptide oxytocin is known to modulate brain regions involved in facial emotion recognition, namely amygdala, in healthy volunteers. Results: Compared to placebo, intranasal OXT attenuated activity in inferior temporal, fusiform and parahippocampal gyri (BA 20), premotor cortex (BA 6), middle frontal gyrus (BA 10) and anterior cingulate gyrus (BA 24) and enhanced activity in the middle occipital gyrus (BA 18), inferior occipital gyrus (BA 19), and superior temporal gyrus (BA 22). There were no significant differences between the conditions on the accuracy scores of emotion recognition between baseline (77.3 ± 18.38), oxytocin (82.63 ± 10.92) or Placebo (76.62 ± 22.67). Conclusion: Our results provide further evidence to the modulatory effect of oxytocin in patients with schizophrenia. Single dose oxytocin resulted in significant changes in activity of brain regions involved in emotion processing. Future studies need to examine the effectiveness of long-term treatment with OXT for emotion recognition deficits in patients with schizophrenia.

Keywords : recognition, functional connectivity, oxytocin, schizophrenia, social cognition

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