blocks allowed to separate activation associated with mental rotation from LRD related activation. The non- rotation condition showed bilateral activation in the angular gyrus, calcarine sulcus, frontal superior medial lobe. The rotated condition resulted in bilateral activation in the occipital lobe (inferior and middle (L) and calcarine sulcus (R) lobe), in inferior and superior parietal areas. In addition activations were observed in the post- and precentral gyrus, and the inferior and superior frontal gyrus. In frontal areas the activation was stronger on the left side.

The findings reveal that LRD condition (non-rotated trials) was especially related to activation in the angular gyrus. The result thereby fits to the findings of previous lesion and imaging studies. In addition, activation near the calcarine sulcus was found which could relate to the occipital activation found in a previous study. The activation found in the rotation condition included areas previously reported for mental rotation.

Authors:
Hjelmervik, Helene; University of Bergen, Norway
Hirnstein, Marco; University of Durham, United Kingdom
Osnes, Berge; University of Bergen, Norway
Endresen, Cecilie; University of Bergen, Norway
Hausmann, Markus; University of Durham, United Kingdom
Hugdahl, Kenneth; University of Bergen, Norway
Specht, Karsten; University of Bergen, Norway

P-14

ACUTE BLOCKADE OF 5-HT2A RECEPTORS REDUCES ORBITOFRONTAL CORTEX RESPONSE TO ANGRY AND FEARFUL FACES

Introduction: The serotonergic transmitter system is involved in modulation of emotions, temperament and individual differences in the risk for developing mood disorders, such as major depression.
We performed pharmacological fMRI in healthy adults to assess the role of 5-HT2A receptors in frontolimbic circuits in emotional processing of faces with negative valence. We used an emotional faces paradigm with and without pharmacological blockade of 5-HT2A receptors by administration of ketanserin. We hypothesised that 5-HT2A receptor blockade leads to an impairment of emotional processing in the orbitofrontal cortex (OFC), since this region has a high 5-HT2A receptor density and is known to be involved in the evaluation of socially relevant stimuli.

Methods: Seventeen subjects (9 males, 8 females), aged 22-40 (32.46 ±2.82,), performed a gender discrimination paradigme. Faces were shown in blocks consisting of male and female faces with neutral, angry or fearful facial expressions, each intermixed pseudorandomly with null events, during two fMRI sessions at 3T, at least one week apart. In one session, 5-HT2A receptors were blocked with ketanserin over time during the scanning session. During the second session no drug was given (control session). The order of sessions was counterbalanced across subjects. Ketanserin was applied intravenously (10 mg bolus followed by 6 mg/h for approx. 75 min).

We had from previous PET scans obtained neocortical 5-HT2A binding potential (BPP) values for each subject. Statistical analyses were performed in SPM5 using a repeated measures ANOVA design including aversive vs. neutral contrasts from the two sessions. The individual contrasts of interest were entered in separate repeated measures ANOVA mo dels that included the average BPP, the ketanserin occupancy (KEToc), and the product of the two latter as covariates for each subject ($p<0.001$, uncorr.).

Results and conclusion: There were no differences in task performance between the control and the ketanserin session. The amygdala was activated when viewing aversive (fearful and angry) compared to neutral faces. The neuronal response in amygdala was not reduced by 5-HT2A receptor blockade. In contrast, 5-HT2A receptor blockade resulted in a bilateral reduction of the neuronal response to aversive faces in medial OFC. The interaction between the covariates BPP and KEToc showed a positive correlation with amygdala. This demonstrates the involvement of amygdala and orbitofrontal 5-HT2A receptor mediated neurotransmission in emotional processing. In conclusion, our results point to a crucial role of serotonergic neurotransmission in the orbitofrontal regions in emotional processing of human faces with negative valence.

Authors:
Hornbøll, Bettina; Danish Recearch Center for MR, Copenhagen University Hospital, Hvidovre, Hvidovre, Denmark, Center for Integrated Molecular Brain Imaging, Copenhagen, Denmark
Wegener, Jon S.; Danish Recearch Center for MR, Copenhagen University Hospital, Hvidovre, Hvidovre, Denmark, Center for Integrated Molecular Brain Imaging, Copenhagen, Denmark
Paulson, Olaf B.; Danish Recearch Center for MR, Copenhagen University Hospital, Hvidovre, Hvidovre, Denmark, Center for Integrated Molecular Brain Imaging, Copenhagen, Denmark
Rowe, James B.; Department of Clinical Neurosciences, Cambridge University, Cambridge, United Kingdom, Center for Integrated Molecular Brain Imaging, Copenhagen, Denmark
Knudsen, Gitte M.; Neurobiology Research Unit, Copenhagen University Hospital, Copenhagen, Denmark, Center for Integrated Molecular Brain Imaging, Copenhagen, Denmark
Siebner, Hartwig; Danish Recearch Center for MR, Copenhagen University Hospital, Hvidovre, Hvidovre, Denmark, Center for Integrated Molecular Brain Imaging, Copenhagen, Denmark
Macoveanu, Julian; Danish Recearch Center for MR, Copenhagen University Hospital, Hvidovre, Hvidovre, Denmark, Center for Integrated Molecular Brain Imaging, Copenhagen, Denmark