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PERIPHERAL SEROTONIN UPTAKE IS RELATED TO NEURAL ACTIVATION IN THE CINGULATE CORTEX

C. Scharinger[1], C. Kasess[2], W. Huf[1,2,3], K. Kalcher[1,2,3], H. Esterbauer[4], H. Sitte[5], S. Kasper[1], E. Moser[2], L. Pezawas[1]

[1]Devision of Biological Psychiatry Department of Psychiatry and Psychotherapy, [2]MR Centre of Excellence Centre for Medical Physics and Biomedical Engineering, Medical University of Vienna, [3]Department of Statistics and Probability Theory, Vienna University of Technology, [4]Clinical Institute of Medical and Chemical Laboratory Diagnostics, Medical University of Vienna, [5]Institute of Pharmacology, Center for Biomolecular Medicine and Pharmacology, Medical Universitiy of Vienna, Vienna, Austria

Introduction: Maximal serotonin transporter (5-HTT) densities have been found in the cingulate cortex, a cortical region that has been critically implicated in emotion processing and the pathophysiology of Major Depressive Disorder. Furthermore, serotonin (5-HT) re-uptake inhibition is the first line strategy in the treatment of depression.

Objectives: Since 5-HTTs are not restricted to neuronal cells, 5-HT uptake velocity (Vmax) can be easily measured on blood platelets subserving as peripheral model of neuronal 5-HTT function and related measures of neural activation.

Aims: To determine whether peripheral 5-HTT uptake velocity is related to neural activation in the cingulate cortex during emotion processing.

Methods: 48 healthy subjects underwent an fMRI paradigm comprising emotional (angry/fearful faces and scenes) and neutral stimuli (simple shapes). 5-HT Vmax was determined in platelets. Subjects were genotyped for a common triallelic polymorphism in the promoter region of the 5-HTT gene (5-HTTLPR).

Results: Significant negative correlations between Vmax and BOLD-signal in the anterior and posterior portion of the cingulate cortex have been found. Cluster maxima within both regions were detected in the subgenual anterior cortex (-1.5, 28.5, -3.5, t=-3.77) and the ventral posterior cingulate cortex (-4.5, -49.5,14.5, t=-3.06). Genotype did not impact on this relationship.

Conclusions: Our results indicate a clear dependency between a peripheral marker, platelet 5-HT uptake velocity, and neural activity in portions of the cingulate cortex for the first time.

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