

ALTERATIONS IN SEROTONIN TRANSPORTER ASYMMETRY IN MALE-TO-FEMALE TRANSSEXUALS MEASURED BY BRAIN PET

G.S. Kranz¹, A. Hahn¹, D. Haeusler², C. Philippe², U. Kaufmann³, W. Wadsak², M. Mitterhauser², S. Kasper¹, R. Lanzenberger¹

¹Department of Psychiatry and Psychotherapy, ²Department of Nuclear Medicine, ³Department of Obstetrics and Gynecology, Medical University of Vienna, Vienna, Austria

Introduction: The serotonergic system modulates brain functions that are considered to underlie affective states, emotion and cognition. Several lines of evidence point towards a strong lateralization of these mental processes, indicating similar asymmetries in associated neurotransmitter systems.

Objectives: To investigate a potential brain asymmetry of the serotonin transporter (SERT) distribution using Positron Emission Tomography (PET).

Aims: As brain asymmetries differ between sexes, we aimed to compare serotonin transporter asymmetry between females, males and male-to-female transsexuals whose brains are considered to be partly feminized.

Methods: 36 subjects aged 19-54 years (9 female controls, 13 male controls and 14 male-to-female transsexuals) were measured with PET and [¹¹C]DASB. Whole-brain voxel-wise SERT binding potential (BP_{ND}) maps were computed using a tracer-specific symmetric template. Statistics comprised repeated measures ANOVA with group as the between subjects factor, voxel-wise SERT asymmetry as repeated factor and group*asymmetry as interaction term.

Results: SERT binding in all groups showed both strong left and rightward asymmetries in several cortical and subcortical structures including temporal and frontal cortices, anterior cingulate, hippocampus, caudate and thalamus ($p < 0.05$ FDR-corrected). Further, male controls showed a rightward asymmetry in the midcingulate cortex ($p > 0.05$ FDR-corrected) which was absent in females and male-to-female transsexuals.

Conclusions: Our data support the notion of a lateralized serotonergic system, which is in line with previous findings of asymmetric serotonin-1A receptor distributions, extracellular serotonin concentrations, serotonin turnover and uptake. The absence of serotonin transporter asymmetry in the midcingulate in male-to-female transsexuals may be attributed to an absence of brain masculinization in this region.