PW01-155 - **SEASONAL ALTERATIONS OF SEROTONIN-1A RECEPTOR BINDING IN THE HEALTHY HUMAN BRAIN**

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Objectives: Serotonergic neurotransmission plays a key role in seasonal changes of mood and behaviour. Higher serotonin transporter availability in healthy human subjects in times of lesser light has been reported in recent studies. Furthermore, seasonal alterations of postsynaptic serotonin-1A receptors have been suggested by a recent animal study. Following that, this study aimed at identifying seasonal alterations of serotonin-1A receptor binding in the living human brain.

Methods: Thirty-six healthy, drug-naïve subjects were investigated using PET and the specific tracer [carbonyl-11C]WAY-100635. Regional serotonin-1A receptor binding ($5\text{-}HT_{1A}$ BP_{ND}) was related to the individual exposure to global radiation. Furthermore, the subjects were divided into two groups depending on individual exposure to global radiation, and the group differences in regional $5\text{-}HT_{1A}$ BP_{ND} were determined.

Results: Correlation analysis controlled for age and gender revealed highly significant positive correlations between regional postsynaptic $5\text{-}HT_{1A}$ BP_{ND} and global radiation accumulated for 5 days (r=.32 to .48, p=.030 to .002). Highly significant differences in $5\text{-}HT_{1A}$ BP_{ND} binding between subjects with low compared to high exposure to global radiation were revealed (T=-2.63 to -3.77, p .013 to .001). 20% to 30% lower $5\text{-}HT_{1A}$ BP_{ND} was found in the subject group exposed to lower amount of global radiation.

Conclusion: Seasonal factors such as exposure to global radiation influence postsynaptic serotonin-1A receptor binding in various brain regions in healthy human subjects. In combination with seasonal alterations in serotonin turnover and 5-HTT availability revealed in recent studies, our results provide an essential contribution of molecular mechanisms in seasonal changes of human serotonergic neurotransmission.

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