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CORTISOL PLASMA LEVELS ARE ASSOCIATED WITH SEROTONIN-1A RECEPTOR BINDING IN POSTMENOPAUSAL WOMEN

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Introduction: Alterations of the serotonin-1A receptor (5-HT_{1A}) and the hypothalamic-pituitary-adrenal (HPA) axis have been reported in depression and anxiety disorders. We previously showed a strong negative correlation between cortisol plasma levels and 5-HT_{1A} receptor binding potential (BP) in patients with social anxiety disorder but not in healthy controls using PET [1].

Objectives: To investigate the relationship of cortisol and the 5-HT_{1A} BP in postmenopausal women, a population that is at increased risk of suffering from depressive symptoms.

Methods: Subjects: 19 postmenopausal women, aged 55.26±4.98, medication free, no current substance abuse or hormone replacement therapy.

PET: Dynamic measurements (50 frames, 90min) were performed using the radioligand [carbonyl-11C]WAY100635 and a GE-Advance scanner. PET data were normalized to a ligand-specific template [2]. Regions-of-interest (ROI) were defined as given in [3]. TACs within ROIs were averaged and the 5-HT_{1A} receptor BP was quantified using Logan-plot and PMOD 3.1. Measurement of total cortisol plasma levels was done using electrochemoluminescence.

Results: We found negative correlations between cortisol and 5-HT_{1A} BP in the midbrain (Spearman's $r_s=-0.54$, $p=0.02$), the median raphe nucleus ($r_s=-0.47$, $p=0.04$) and the nucleus accumbens ($r_s=-0.505$, $p=0.03$).

Conclusions: In line with our previous findings [1], the observed negative association between cortisol plasma levels and 5-HT_{1A} BP might reflect an increased vulnerability for mood disorders in postmenopausal women.

1. Lanzenberger R., et al., *Int J Neuropsychopharmacol*, 2010. 13(9):p.1129-43.
2. Fink M., et al., *Neuroimage*, 2009. 45(2): p.598-605.
3. Stein P., et al., *Eur J Nucl Med Mol Imaging*, 2008. 35(12):p.2159-68.