RELATIONSHIP BETWEEN BRAIN SEROTONIN TRANSPORTER (5-HTT) BINDING AND ANXIETY IN MAJOR DEPRESSIVE DISORDER

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Background: The central serotonergic system has been implicated in pathological anxiety. Positron emission tomography allows quantification of regional brain serotonergic receptors and the serotonin transporter (5-HTT). Previously, we reported correlations between psychic and somatic symptoms and serotonin-1A receptor (5-HT₁A) binding potential in major depressive disorder (MDD). We now examine the relationship between regional brain 5-HTT binding and anxiety components (psychic, somatic, motoric) to elucidate the role of 5-HTT in expression of pathological anxiety symptoms in MDD.

Methods: 55 medication-free individuals (31 Female, 24 Male) with MDD participated in the study, with the 5-HTT radioligand [¹¹C]DASB. Anxiety component scores were calculated by multiplying anxiety item scores from the Hamilton Depression Rating Scale and the Brief Psychiatric Rating Scale, with component loadings derived from our previous Principal Component Analysis of a large MDD sample (N=288). We performed a weighted stepwise linear regression between the standardized natural logarithm of 5-HTT binding for 10 regions of interest (ROIs) and four standardized predictors (somatic, motoric, psychic anxiety component scores and gender).

Results: Correlations between 5-HTT binding and anxiety were significant in three regions after Bonferroni correction. The highest R-square was obtained in midbrain (R-square=0.539), where both psychic and somatic anxieties correlated with 5-HTT binding (p<0.01). In thalamus, amygdala and midbrain, somatic anxiety was negatively related to 5-HTT binding. In midbrain, psychic anxiety was positively related to 5-HTT binding.

Conclusions: In a previous study, psychic and somatic anxiety symptoms were correlated with 5-HT₁A binding in MDD. We report the same tendency for 5-HTT binding, indicating an indirect relationship between 5-HT₁A and 5-HTT in anxiety. Further, the ROIs with significant correlations have been implicated in the pathophysiology of anxiety. Characterization of the relationships of anxiety components with regional 5-HTT binding may aid in developing anxiety-specific treatment options and monitoring the course of illness for individuals with MDD.