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Relationship between serum calcium and neuropsychological performance might indicate etiological heterogeneity underlying cognitive deficits in schizophrenia and depression

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Abstract

Cognitive dysfunction is a core feature of schizophrenia spectrum and depressive disorders. Influx of extracellular calcium is essential for neuronal processes such as pre-synaptic neurotransmitter release and NMDA receptor mediated neuroplasticity. Since serum and brain interstitial fluids maintain equilibrium for ion concentrations via passive diffusion, the amount of peripheral calcium could affect neuronal and hence cognitive function. Within the physiological norm-levels, we hypothesized higher serum-calcium to be associated with better neuropsychological performance in patients diagnosed with schizophrenia or depression. One-tailed Pearson's correlations were calculated between total serum-calcium levels and performance on an extensive computer-based neuropsychological test battery. Influence of covariates was assessed using linear regression. Serum calcium was significantly and positively correlated with neuropsychological composite, information processing speed, executive function and global assessment of functioning (GAF) in depression patients but not in schizophrenia patients. Amongst covariates, age associated significantly with serum calcium and neuropsychological functioning in depression but only with serum calcium in schizophrenia group. The study provides first evidence for a positive relationship between

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