D-aspartate serum levels are altered in patients with treatment and non-treatment-resistant schizophrenia but not with autism spectrum disorder

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Schizophrenia (SCZ) and autism spectrum disorder (ASD) are neurodevelopmental diseases characterized by different psychopathological manifestations and divergent clinical trajectories. Various alterations at glutamatergic synapses have been reported in both disorders, including abnormal NMDA and metabotropic receptor signaling. We conducted a retrospective bicentric study to assess the levels of neuroactive D- and L-amino acids and their precursors in the serum of ASD, SCZ patients and their respective healthy controls. Twenty patients diagnosed with ASD and twenty-four control subjects were recruited from Istituto Giannina Gaslini (Genoa, Italy), while additional thirty-three ASD patients and six controls were recruited from the Federico II Hospital (Naples, Italy). Moreover, twenty-six SCZ patients and thirteen non-psychiatric control subjects were recruited from the same Neapolitan Hospital. Specifically, the SCZ patients were subdivided into treatment-resistant and non-treatment-resistant SCZ patients, based on their responsivity to conventional antipsychotics. We quantified serum concentrations of L-glutamate, L-aspartate, glycine, L-glutamine, L-asparagine, D-aspartate, D-serine, L-serine through High-Performance Liquid Chromatography. No significant differences between cases and controls were found in amino acid concentrations in the two independent ASD cohorts analyzed. Conversely, D-serine and D-aspartate serum reductions were found in SCZ patients compared to controls. This result further encourages future research to evaluate the predictive role of selected D-amino acids as peripheral markers for SCZ pathophysiology and diagnosis.

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