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MULTIVARIATE ANALYSIS OF RECEPTOR, TRANSPORTER AND NEUROTRANSMITTER LEVEL CHANGES IN POST-MORTEM BRAIN SAMPLES OF CLONINGER TYPE 1 AND 2 ALCOHOLICS
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With the goal of understanding the pathology of extensive alcohol consumption to the brain we have previously published over 20 articles about changes in neurotransmitter, receptor and transporter levels measured from post-mortem brain samples from Cloninger type 1 (n = 9) and type 2 (n = 8) alcoholics and non-alcoholic controls (n = 10). The main aim of the present study was to achieve an overview of the changes seen using multivariate analyses to the previously published data. We used principal component analysis (PCA) and partial least squares discriminant analysis (PLS-DA) to analyse receptor and transmitter binding data from whole-hemisphere autoradiography analyses and neurotransmitter levels from mass spectrometry analyses. PCA analysis showed a separation of the study groups, which was further studied with PLS-DA. Analyses highlighted the role of GABAergic and serotonergic changes in separating alcoholics from controls. Main separating features for type 1 alcoholics from type 2 alcoholics and controls were decreased dopamine transporter and anandamide levels. Type 2 alcoholics showed increased levels of glutamatergic receptors and decreased levels of serotonergic receptors. Overall, role of changes in the nucleus accumbens and insular cortex were highlighted in the PLS-DA analysis. The present results demonstrate the possibilities of using multivariate analyses to study overall pathological changes in the post-mortem brain of alcoholics.