

IS THERE EVIDENCE FOR A LINK BETWEEN STRESS AND ADDICTION?

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Introduction: Stress and reward processing are two of the principal mechanisms involved in the modulation of homeostasis in the body. According to neurobiological research, these two mechanisms overlap in the cortico-striatal-limbic circuit, which can be disrupted due to chronic stress and substance abuse. Stress is primarily modulated by the hypothalamic-pituitary-adrenal (HPA) axis, from which cortisol is an end-product.

Objectives: The aim of the study was to investigate the effects of chronic stimulant abuse on the cortico-striatal limbic circuit. This was examined by relating cortisol levels with grey matter volume in brain structures associated with addiction and stress.

Aims: We hypothesised that stimulant-dependent individuals show increased cortisol levels and abnormalities in the cortico-striatal-limbic circuit. We further hypothesised relationships between altered grey matter volume and increased cortisol levels in the patients.

Methods: Twenty-two stimulant-dependent individuals and 21 healthy volunteers (matched for age and gender) underwent an assessment session and structural MRI brain scan. Cortisol was assessed in saliva and blood plasma. Mood, impulsivity and compulsivity were measured by clinical instruments.

Results: Stimulant-dependent individuals showed higher levels of cortisol in both saliva and blood, which were associated with distinct alterations in grey matter volume in fronto-limbic structures. Plasma cortisol was positively correlated with the duration of cocaine use. No relationships were found with current mood, trait-impulsivity and drug-related compulsivity.

Conclusions: The relationships observed between cortisol and fronto-limbic structures may, in part, be explained by HPA axis dysfunction and its downstream effects on brain structures involved in stress modulation in stimulant-dependent individuals.