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Predicting the Failure of Disc Surgery by a Hypofunctional HPA Axis: Evidence from a Prospective Study.

Patients with postoperative ongoing sciatic pain have been shown to exhibit reduced cortisol levels along with enhanced Interlukin-6 (IL-6) levels.

The aim of the present study was to clarify the relationship between a reduced cortisol secretion and enhanced cytokine levels by performing a prospective study on patients with disc herniation.

Twenty-two patients were examined before and after their disc surgery. Twelve healthy, pain-free subjects matched for age, education and gender constituted the control group.

The preoperative examinations included the assessment of the diurnal pattern of cortisol secretion and the feedback sensitivity of the hypothalamus-pituitary-adrenal (HPA) axis. Patients' subjective stress levels also were assessed during the preoperative examination. The diurnal pattern of cortisol secretion was again assessed during the postoperative examination. Furthermore, blood samples were collected to measure catecholamine, adrenocorticotrophic hormone (ACTH)- and interleukin-6 (IL-6) levels before and after measuring the pressure pain thresholds (PPTs). An assessment of the sensitivity of circulating monocytes to the immunosuppressive effects of glucocorticoids was further included in the postoperative examinations.

Failed back syndrome (FBS) patients ($n=12$) showed a reduced cortisol secretion in the morning hours and enhanced feedback sensitivity of the HPA axis. Furthermore, FBS patients displayed an increased in-vitro production of proinflammatory cytokines and a relative glucocorticoid resistance of pro-inflammatory cytokine producing monocytes as compared to non-FBS patients ($n=10$) and controls. After PPT measurement FBS patients exhibited an increased norepinephrine but decreased epinephrine response, together with lower ACTH levels and a four times higher plasma IL-6 response.

These findings suggest that **chronically stressed patients are at a higher risk for a poor surgical outcome** as their reduced cortisol secretion promotes the postoperative ongoing synthesis of proinflammatory cytokines.

Reference: Geiss A, Rohleder N, Kirschbaum C, Steinbach K, Bauer HW, Anton F. *Predicting the failure of disc surgery by a hypofunctional HPA axis: evidence from a prospective study on patients undergoing disc surgery.* Pain 2005;114:104-17.