SERUM BRAIN-DERIVED NEUROTROPHIC FACTOR IN CUSHING'S SYNDROME PATIENTS (*EP- 64 / ADRENAL*)

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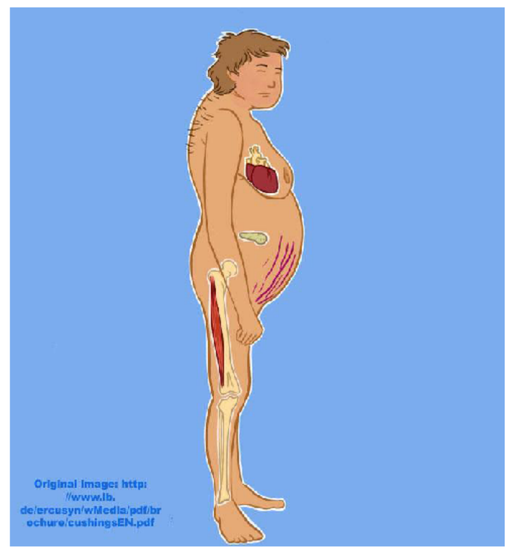
INTRODUCTION AND AIMS

Brain-derived neurotrophic factor (BDNF) is a protein member of the neurotrophin family of growth factors that has been linked to several cardiovascular risk factors and bone status. Stress and corticosteroid exposure can affect BDNF levels, although this has never been studied in Cushing's syndrome (CS). The aims of this study were: 1) to establish if BDNF levels were reduced in CS and 2) to check possible associations between BDNF and cardiovascular risk factors and bone status.



METHODS

Three groups of subjects were evaluated:
- Patients with cured CS (N= 34, 7 males, mean age 47.41±11.55)
- Patients with active CS (N= 18, 3 males, mean age 46.27±10.54)
- Healthy controls (N= 52, 10 males, mean age 47.19±11.64)

Patients and controls were matched for sex and age. Blood tests (including biochemistry, cortisol and BDNF), anthropometry, a complete clinical examination and a whole body dual x-ray absorptiometry (DEXA) were performed. Patients were considered biochemically cured of CS after surgery if adrenal insufficiency was demonstrated or if morning cortisol suppression (<50 nmol/l) was observed after 1 mg dexamethasone overnight and if repeated 24 h urinary free cortisol measures were normal (<280 nmol/l). Patients that did not fulfil these criteria were considered to have active CS. Statistical analysis was performed using ANOVA with Bonferroni correction, and Pearson's correlations.

	Active CS	CS in remission	Controls
Weight (kg)	78.9 ± 16.6 *	72.2 ± 15.1	67.9 ± 13.4
Waist (cm)	100.2 ± 12.0 *	95.4 ± 15.0 *	86.3± 12.9
Total cholesterol (mmol/L)	5.3 ± 1.0	5.3 ± 0.9	5.3 ± 1.1
Triglycerides (mmol/L)	1.2 ± 0.7	1.3 ± 0.7 *	0.9 ± 0.4
Systolic blood pressure (mm/Hg)	130.2 ± 19.9	132.1 ± 20.3 *	118.7 ± 15.7
Diastolic blood pressure (mm/Hg)	83.9 ± 14.7 *	81.3 ± 11.9 *	71.1 ± 8.0

Table 1. Clinical characteristics of CS patients (active and in remission) and controls. Scores are represented as mean ± standard deviation

RESULTS

Clinical characteristics of patients and controls can be seen in table 1. BDNF was reduced in both active and CS patients in remission, compared to controls ($p<0.001$; $p<0.05$) (Figure 1). Both patient groups had higher waist ($p<0.01$, $p<0.05$) and diastolic blood pressure ($p<0.001$ both), while CS in remission also showed higher systolic blood pressure ($p<0.01$) and triglycerides ($p<0.01$) than controls. Active patients had higher weight than controls ($p<0.005$). Correlations including the whole sample showed that BDNF positively correlated with DEXA bone mineral content ($r=0.285$, $p<0.01$), meaning that reduced BDNF indicated less bone mineral content. BDNF also correlated negatively with diastolic blood pressure ($r=-0.210$, $p<0.05$). A tendency was found for systolic blood pressure ($r=-0.196$, $p= 0.057$). BDNF did not correlate with urinary free cortisol levels, ACTH, blood cortisol, waist, total cholesterol or triglyceride levels.

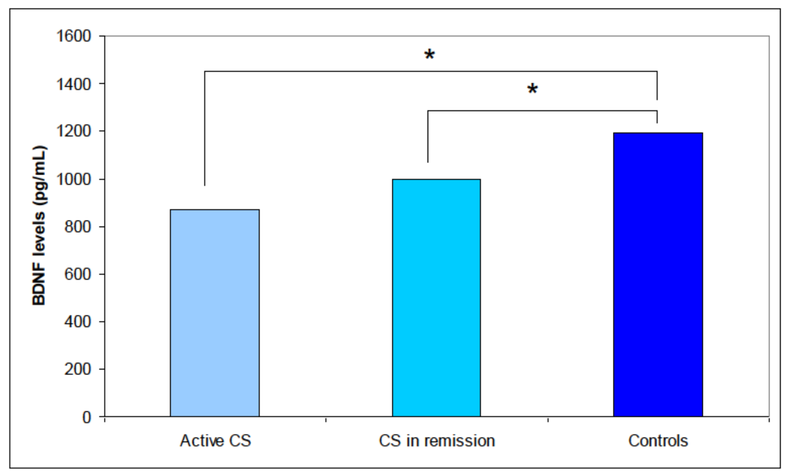


Figure 1. BDNF levels in CS patients (active and in remission) and controls.

CONCLUSIONS

BDNF is reduced in CS patients, even after cure. Negative correlations suggest that it may contribute to persistent co-morbidities seen in CS patients, such as osteoporosis and hypertension.

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