



# Plasma Brain Derived Neurotrophic Factor is Decreased in Women with Polycystic Ovary Syndrome and Related to the Markers of Endothelial Dysfunction

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## BACKGROUND

Brain derived neurotrophic factor (BDNF) is a neurotrophin which plays a role in neuronal growth and differentiation. Decreased level of BDNF is supposed to play a role in the pathogenesis of the neurodegenerative diseases. Recent data indicate that BDNF could be also involved in angiogenesis. Several lines of evidence support the role of BDNF in glucose metabolism. The decreased level of BDNF are observed in obesity and type 2 diabetes mellitus. Polycystic ovary syndrome (PCOS) is a common endocrine disorder associated with insulin resistance and increased risk of cardiovascular diseases.

## AIM

The aim of the present study was to determine plasma BDNF concentration in patients with PCOS in comparison to healthy women.

## STUDY PARTICIPANTS

We studied 74 women with PCOS and 37 healthy, regularly menstruating women.

## METHODS

- PCOS was diagnosed according to the Rotterdam criteria. Studies were performed 3-5 days after a spontaneous menses, or independent of cycle phase in the presence of amenorrhea and in regularly cycling women during the early follicular phase (3-5 day) of their menstrual cycle. All analyses were performed after an overnight fast.
- Clinical examination, anthropometric measurements (BMI, WHR), percent of body fat (assessed by bioelectric impedance analysis using In Body 220 Body Composition Analyzer) was performed in the all study participants.
- Subjects underwent an oral glucose tolerance test (OGTT). The blood samples for glucose and insulin determinations were taken at 0min, 60, 120min.
- Fasting blood samples were taken before OGTT for determination of sex hormone binding globulin (SHBG), adiponectin, soluble E-selectin (sE-selectin), intercellular adhesion cell molecule-1 (sICAM-1), hormonal and lipid profile and BDNF.
- Insulin sensitivity was evaluated by the euglycemic hyperinsulinemic clamp technique as described by DeFronzo et al.

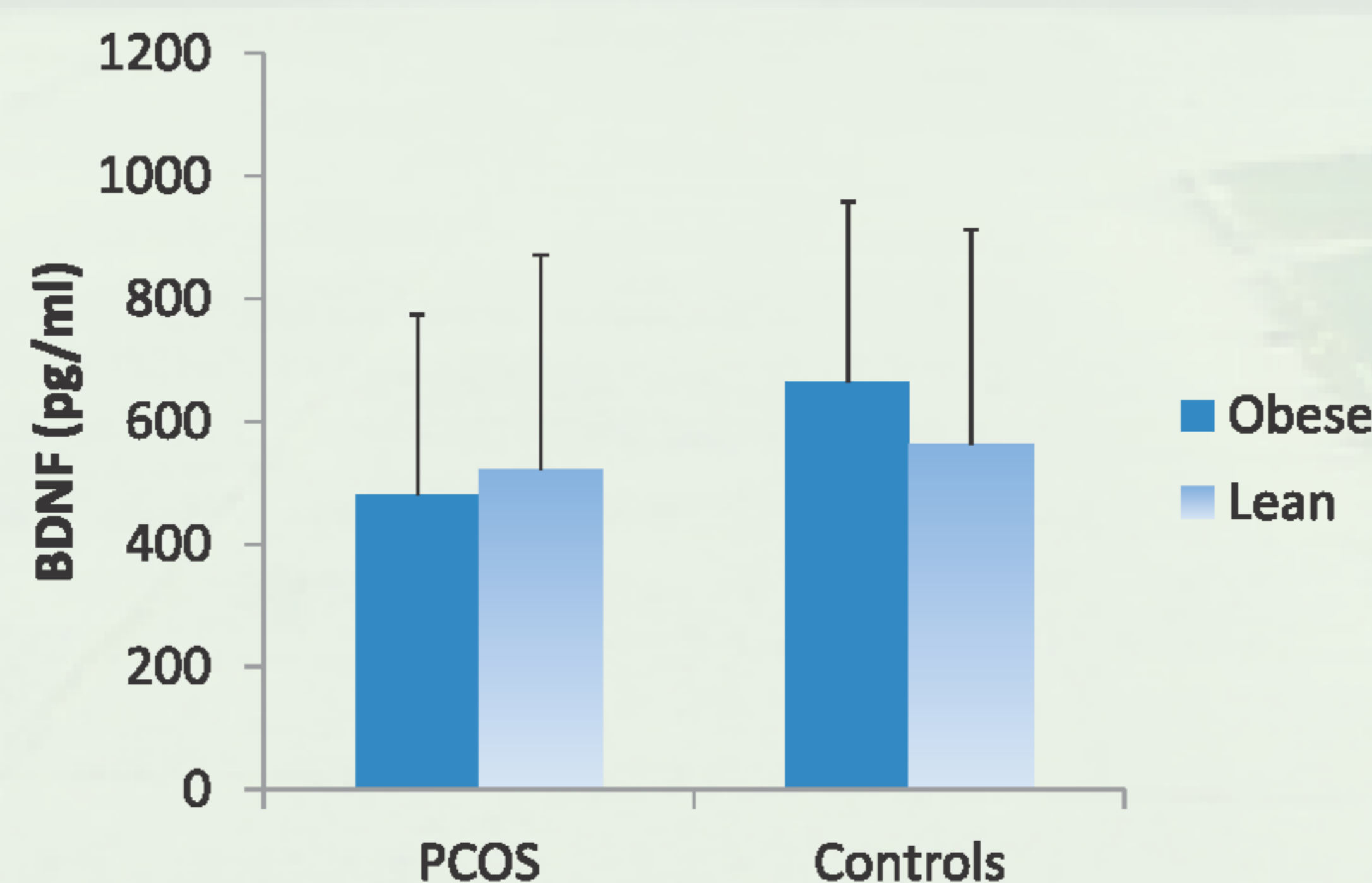
## RESULTS

Table 1. Clinical, hormonal and metabolic characteristic of studied groups

	PCOS (n=74)	Control (n=37)
Age (years)	25.34 ± 5.33	26.81 ± 6.61
BMI (kg/m <sup>2</sup> )	27.60 ± 6.73	26.69 ± 6.72
% body fat	35.31 ± 11.22	31.03 ± 10.45
Fasting glucose (mg/dl)	82.31 ± 7.76	83.66 ± 9.19
Fasting insulin (μU/ml)	14.52 ± 7.49	14.31 ± 8.69
Mifm (mg x kg <sup>-1</sup> x min <sup>-1</sup> )	8.17 ± 3.26	8.99 ± 3.56
CHOL (mg/dl)	176.92 ± 30.89	174.97 ± 30.73
TG (mg/dl)	87.28 ± 42.42	77.58 ± 45.49
HDL-cholesterol (mg/dl)	60.16 ± 9.76	57.47 ± 11.45
LDL-cholesterol (mg/dl)	97.32 ± 28.28	96.24 ± 31.15
LH (μU/ml)	8.19 ± 4.41*	4.80 ± 2.17
FSH (μU/ml)	5.61 ± 1.84	5.54 ± 1.93
PRL (ng/ml)	13.11 ± 9.60	13.44 ± 12.80
Estradiol (pg/ml)	79.02 ± 70.37	63.21 ± 62.94
Testosterone (ng/dl)	81.47 ± 38.60*	63.47 ± 24.19
SHBG (nmol/l)	43.40 ± 24.84*	54.23 ± 45.75
sICAM-1 (ng/ml)	289.15 ± 95.39	292.10 ± 98.13
sE-selectin (ng/ml)	35.84 ± 16.61	33.89 ± 15.44
Adiponectin (μg/ml)	11.20 ± 4.23	10.58 ± 4.52

\*p<0.05

Fig. 1 Plasma BDNF concentrations in the studied groups



p=0.03 - PCOS - obese vs. Controls - obese

Table 2. Correlations of plasma BDNF with adiponectin, sICAM-1, sE-selectin, SHBG in PCOS

	PCOS	
	r	p
Adiponectin	0.29	0.012
sICAM-1	-0.28	0.014
sE-selectin	-0.24	0.033
SHBG	0.26	0.024

## CONCLUSION

Our data indicate that BDNF is decreased in obese PCOS women and related to the markers of endothelial dysfunction.

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