INTRODUCTION: Brain-derived neurotrophic factor (BDNF) and urocortin-1 (Ucn1) are neuropeptides found in human peripheral plasma and associated with complex behavioral responses to physical injury and chronic stress. Endometriosis is a chronic, painful, inflammatory condition that alters the plasma levels of many signaling molecules, such as cytokines and hormones, but the use of these molecules as diagnostic markers for endometriosis has been hampered by their nonspecific increase in women with other pain syndromes or inflammatory diseases. Therefore, a persisting challenge in endometriosis research is to pursue a biomarker that changes in endometriosis but not in other forms of pelvic pain. The aim of this study was to test whether plasma levels of BDNF and Ucn1 are useful to predict the presence of endometriosis in women with pelvic pain.

METHODS: We carried out a prospective cohort study including 63 consecutive women aged 17-52 years, scheduled for laparoscopy due to chronic pelvic pain. Peripheral blood samples were withdrawn immediately before laparoscopy and assayed for plasma concentrations of BDNF and Ucn1 using specific enzyme immunoassays.

RESULTS: Women ultimately proven to have endometriosis (n=31) had higher preoperative plasma BDNF (median = 710 [IQR 550-1100 pg/ml) vs. 575 [353-710 pg/ml, p<0.05, Mann-Whitney test) and Ucn1 levels (61 [49-104] vs. 53 [31-69] pg/ml, p<0.05) compared to women who did not have endometriosis (n=32). The two markers were uncorrelated (Spearman’s rho = 0.08), but BDNF levels were positively correlated with the intensity of pelvic pain (rho = 0.35, p<0.01). The areas under the receiving operator characteristic (ROC) curves to detect endometriosis in this setting were, respectively, 0.64 and 0.62 for BDNF and Ucn1, and the detection rates were 26% with BDNF and 24% with Ucn1 at 90% specificity cut-offs.

CONCLUSION: Both BDNF and Ucn1 are increased in women with pelvic pain and endometriosis compared to women with pelvic pain of other etiologies. However, the low detection rate at the desired specificity suggests that these neuropeptides do not qualify as useful diagnostic markers of endometriosis in women with painful symptoms.

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