

## **Abstract**

**Background:** We aimed to summarize the available data regarding the levels of leptin and adiponectin and the key modulators of endometriosis compared to the controls.

**Methods:** The electronic databases such as MEDLINE, Embase, Scopus, Cochrane Library, and Web of Science were searched up to October 2020. The circulating and peritoneal levels of leptin and circulating levels of adiponectin were included. We used the Cochrane's Q test and the I<sup>2</sup> statistic in this study. These tests' weighted mean difference (WMD) and 95% CIs were considered as the summary effect size. They were then pooled using a random-effects model with the DerSimonian-Laird method.

**Results:** Twenty eligible articles (or 25 studies) with 2645 participants (1362 women with endometriosis and 1283 controls) were included. Pooled results showed that women with endometriosis had significantly higher leptin levels (WMD = 4.45 mg/ml, 95%CI = 2.42-6.49,  $p < .01$ ) and leptin/BMI ratio (WMD = 0.32 mg/ml, 95%CI = 0.23-0.42,  $p < .001$ ) than the controls, whereas adiponectin levels (WMD = -0.24 mg/ml, 95%CI = -4.27 to -0.01,  $p = .038$ ) were significantly lower. The pooled results also indicated significantly lower leptin levels in women with advanced-stage endometriosis (WMD = -8.07 mg/ml, 95%CI = -14.22 to -1.92,  $p = .01$ ) than in the early stage. It was found, however, that there were no significant differences in adiponectin levels of women with advanced-stage endometriosis (WMD = -0.16 mg/ml, 95%CI = -0.64 to 0.32,  $p = .512$ ) and the early-stage ones.

**Conclusion:** We showed that leptin levels and leptin/BMI ratio were significantly higher in women with endometriosis than the controls. Nonetheless, patients with endometriosis had significantly lower levels of adiponectin than the controls.