Abstract

Aim: Endothelial reactivity is inhibited and oxidative stress is enhanced in women with endometriosis. Testosterone may adversely affect lipids and endothelium. We investigated the effects of androgenic properties of progestins combined with ethinyl estradiol (EE) on endothelial function, lipids and free radical production in such women.

Methods: Women with endometriosis were treated with 20 μg EE + 3 mg drospirenone (DRSP) or 35 μg EE + 1 mg norethisterone (NET) for 3 months. Plasma concentrations of sex hormone-binding globulin (SHBG), lipids, copper (Cu), derivatives of reactive oxygen metabolites (d-ROMs), biological antioxidant potential (BAP), nitrite/nitrate, endothelin-1 and asymmetrical dimethylarginine (ADMA) were measured before and after treatment. Flow-mediated vasodilation (FMD) of the brachial artery was measured by ultrasonography.

Results: DRSP group, but not NET group, significantly increased FMD and concentrations of nitrite/nitrate and small dense LDL cholesterol, while decreased endothelin-1 concentrations. In both groups, ADMA and LDL cholesterol concentrations were significantly decreased, but triglyceride, SHBG, d-ROMs, Cu and ceruloplasmin concentrations increased, and BAP concentrations did not change. DRSP group significantly increased HDL cholesterol concentrations, whereas NET group decreased its concentrations. Changes in triglyceride correlated positively either with changes in SHBG ($r = 0.57$, $P < 0.001$) or with small dense LDL cholesterol ($r = 0.45$, $P = 0.005$). Changes in Cu correlated positively with changes in d-ROMs ($r = 0.87$, $P < 0.001$).

Conclusion: Androgenic properties of progestin may counteract EE's favorable effects on endothelial function and HDL cholesterol, while eliminating its adverse effects on increased triglyceride-induced small dense LDL cholesterol in women with endometriosis.