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The Effect of Levonorgestrel and Melatonin Treatments on Plasma Oxidant-Antioxidant System, and Lipid/Lipoprotein Levels in Female Rats

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Abstract: This study was carried out in order to determine the effects of levonorgestrel (LNG) and progestin derivatives, alone and in combination with melatonin (MEL), on the plasma oxidant-antioxidant system, and also lipid and lipoprotein levels, in the rat model. Female rats were divided into 4 groups according to subcutaneous treatment with LNG (5 mg/kg/day), MEL (25 mg/kg/day) and a LNG-MEL combination (5 mg LNG/25 mg MEL/kg/day) for 5 consecutive days, and a control group. Following the treatment period, malondialdehyde (MDA), conjugated dienes (CD), thiol (SH) and glutathione peroxidase (GPx) values, as the components of the oxidant-antioxidant system, and also triglyceride (TG) and cholesterol (TC, HDL-C, LDL-C) levels were measured in plasma obtained from the rats. Statistical comparisons were made using ANOVA and post-ANOVA tests. There were no significant differences in respect of any of the measured parameters between the controls and the MEL group. Although there were no significant differences in TG and HDL-C, MDA and CD levels were found to be higher, but SH and GPx values lower in the LNG group than in the control and MEL groups. On the other hand, the LNG treatment along with MEL resulted in significant decreases in MDA, CD, TC, LDL-C levels and elevations in SH and GPx in respect of the LNG group, and these values measured in the LNG-MEL group were not different from those of the control and MEL groups. In conclusion, the use of MEL together with synthetic sex steroids, which may lead to oxidative stress and induce the risk of cardiovascular disease (CVD), may play an important role in reducing the risk of CVD, through the protection of the antioxidant system.

Key Words: Levonorgestrel, melatonin, the risk of cardiovascular disease, oxidant- antioxidant system, lipid-lipoprotein profiles

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