EFFECTS OF METFORMIN ON OVARIECTOMIZED WISTAR RATS.

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Introduction and objectives: Menopause is associated with increased risks of developing some diseases as diabetes. Estradiol has been used as a hormone therapy for post-menopausal women in order to prevent those diseases, even though it raises the risks of cancer. Metformin is a common drug prescribed for diabetes with few collateral effects. It acts either lowering food intake and body weight, or improving insulin resistance and lipid profile. All of these parameters are impaired in ovariectomized rats, a model of low levels of female hormones so as occurs in post-menopausal. Thus, the aim of this work was to evaluate whether metformin could prevent the metabolic dysfunction developed early after ovariectomy.

Materials and methods: Female Wistar rats were divided into four groups: sham-operated (sham), ovariectomized + vehicle (ovx), ovariectomized + estradiol (e2) (estradiol benzoate 7 µg/mL/kg) and ovariectomized + metformin (met) (500 mg/kg/day). The animals were sacrificed 21 days after surgery.

Results and conclusions: At the end of the treatment, increased weight gain (1.16-fold) and food efficiency (3.33-fold) of ovariectomy were partially prevented by metformin (1.07-fold and 2.02-fold, respectively). This drug was able to block the 1.2-fold increased serum cholesterol in ovx when compared with sham. Estradiol was able to maintain all parameters to sham levels. Serum triglycerides has decreased in ovx (0.77-fold) and met (0.54-fold). Metformin and estradiol were able to decrease the levels of triglycerides in the liver (0.79-fold and 0.89-fold respectively) when compared with ovx. Western blotting for pAMPK did not change despite the tendency of decreasing pACC in ovx and met, when compared with sham and e2. Our results suggest that metformin prevents partially the metabolic dysfunction that occurs in ovariectomy model. This improvement is independent of AMPK phosphorylation although ACC phosphorylation seems to be modulated.

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