

A comparison of two progestins on myocardial ischemia-reperfusion injury in ovariectomized monkeys receiving estrogen therapy

Suparto, Irma H.; Koufy Williams, J.; Fox, Jamie L.; Vinten-Johansen, Jakob

Abstract

Objective: It has been reported that the progestin medroxyprogesterone acetate (MPA), but not norethindrone acetate (NETA), inhibits the beneficial vascular effects of post-menopausal estrogen therapy, but their effects on the myocardium are unclear. The goal of this study is to compare the effects of these two progestins on post-ischemic myocardial damage.

Methods: Ovariectomized monkeys were fed an atherogenic diet for 18 months while receiving, or not receiving (control, $n=15$), the monkey equivalent to a woman's dose of 5 μg ethinyl estradiol with either 1 mg NETA daily ($n=15$) or 2.5 mg MPA daily ($n=15$). The left anterior descending coronary artery was occluded for 1 h and then released to allow myocardial reperfusion for 4 h. Infarct size was quantified using the histochemical stain triphenyl-tetrazolium chloride. Regional myocardial blood flow was measured by 15 μm neutron-activated microspheres, blood pressure and heart rates with a pneumatic cuff, stroke volume by echocardiography, coronary output by thermodilution and neutrophil accumulation in the myocardium using myeloperoxidase (MPO) activity.

Results: The infarct size (area of necrosis/area at risk) was similar between the control group ($21\pm 3\%$) and the MPA group ($29\pm 3\%$) ($P<0.05$) but significantly less in the NETA group ($3\pm 2\%$) than other groups ($P<0.05$). The hemodynamic myocardial function and regional myocardial blood values were similar among groups before, during and 4 h after reperfusion (all P -values >0.05). Similarly, there were no treatment effects on MPO activity ($P>0.05$).

Conclusions: NETA, but not MPA, diminished ischemia-reperfusion injury in estrogen-treated post-menopausal females. The mechanism(s) of this difference remains unclear.

© 2005 Lippincott Williams & Wilkins, Inc

Coronary Artery Disease:
August 2005 - Volume 16 - Issue 5 - pp 301-308
Pathophysiology and Natural History