

Cardiovascular remodelling in female diabetic rats

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Diabetic cardiomyopathy involves both cardiac and large vessels alterations in their biochemical and biomechanical properties. Part of these dysfunctions is due to ROS overproduction and advanced glycated end-products (AGEs) synthesis caused by high blood glucose concentrations (1). Epidemiological studies usually ignore sex-gender outcomes of diabetes that has higher cardiovascular risk in women than in men (2). The aim of the present study was to assess the effects of diabetes on aorta, portal vein and myocardium morphology in females Wistar rats. Diabetes was induced by a single dose of streptozotocin 65 mg/kg, and, after 4 and half months, we evaluated the cardiovascular remodelling by light and transmission electron microscopy (TEM).

Paraformaldehyde fixed samples of aorta and portal vein were stained with Masson Trichrome method (for collagen fibers), Weigert's stain (for elastic fibers), Hematoxylin and Eosin (for nuclei), and underwent to morphometric analysis. TEM samples were prepared accordingly to common protocols.

Morphometric analysis performed on diabetic aortas showed a reduction of tunica media thickness, but the internal diameter width or the lumen cross-area was unchanged compared to controls. The number of smooth muscle cells increased in tunica media of diabetic aortas. The main change observed in diabetic portal veins was a reduction of the area occupied by elastic fibers in tunica adventitia.

TEM observations of papillary muscles did not reveal any changes in the sarcomere lengths across the two experimental groups.

These results display slight differences on what was reported in male rats (3) and account for a different development of diabetes in female subjects.

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References

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Keywords

Diabetes; females; cardiovascular system; streptozotocin.