



Administration of L-carnitine and mildronate improves endothelial function and decreases mortality in hypertensive Dahl rats

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Abstract:

Hypertension is a well established risk factor for the development of cardiovascular diseases and increased mortality. This study was performed to investigate the effects of the administration of L-carnitine or mildronate, an inhibitor of L-carnitine biosynthesis, or their combination on the development of hypertension-related complications in Dahl salt-sensitive (DS) rats fed with a high salt diet. Male DS rats were fed laboratory chow containing 8% NaCl from 7 weeks of age. Experimental animals were divided into five groups and treated for 8 weeks with vehicle (water; n = 10), L-carnitine (100 mg/kg, n = 10), mildronate (100 mg/kg, n = 10) or a combination of L-carnitine and mildronate at the doses above (n = 10). During the experiment, control group animals continued to consume a diet with normal salt content. Administration of the combination significantly improved the survival rate for 50% of the population. None of the tested compounds or their combination influenced high salt intake-induced hypertension, while treatment with mildronate and the combination for 8 weeks significantly decreased resting heart rate by 12% and 10%, respectively. Feeding with high salt diet had no influence on systolic function of the heart, but it induced thickening of the ventricular walls and development of heart hypertrophy that was not improved by the administration of tested compounds. In addition, administration of the combination attenuated the development of endothelial dysfunction in isolated aortic rings. In conclusion, our results demonstrate that treatment with a combination of L-carnitine and mildronate is protective against hypertension-induced complications in an experimental model of salt-induced hypertension.

Key words:

mildronate; L-carnitine; Dahl salt-sensitive rats; hypertension; endothelial dysfunction
