



Beneficial role of telmisartan on cardiovascular complications associated with STZ-induced type 2 diabetes in rats

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Abstract:

We studied the effect of an eight-week treatment with telmisartan ($5 \text{ mg kg}^{-1} \text{ day}^{-1}$) on cardiovascular complications that are associated with type 2 diabetes in a neonatal rat model. Type 2 diabetes was induced by the administration of 90 mg/kg streptozotocin (STZ), *ip*, in two-day-old rats. The development of diabetes was checked 12 weeks after STZ administration, and the animals were divided into different groups. Telmisartan treatment was given for eight weeks. At the end of the eight-week treatment, various biochemical and cardiac parameters were measured. Diabetic rats exhibited hyperglycemia, hyperinsulinemia, hyperlipidemia, increased blood pressure and heart rate, increased creatinine, cardiac enzyme and C-reactive protein (CRP) levels, a reduction in the rate of pressure development and decay, cardiac hypertrophy and oxidative stress. Chronic treatment with telmisartan significantly prevented STZ-induced hypertension and tachycardia and elevated fasting glucose and insulin levels. It significantly prevented the dyslipidemia and significantly reduced the elevated creatinine and CRP levels and the levels of other cardiac enzyme markers, like lactate dehydrogenase and creatinine kinase, in diabetic rats. There was an increase in rate of blood pressure development and decay with telmisartan treatment. Telmisartan also produced beneficial effects by preventing cardiac hypertrophy, which was evident from left ventricular collagen levels, the cardiac hypertrophy index and the left ventricular hypertrophy index in diabetic rats. Telmisartan successfully prevented oxidative stress, which was evidenced by a decrease in malondialdehyde and an increase in glutathione, catalase, superoxide dismutase levels. In conclusion, our data suggest that telmisartan prevented STZ-induced metabolic abnormalities and cardiovascular complications in type 2 diabetes.

Key words:

cardiovascular complications, cardiac hypertrophy, telmisartan, type 2 diabetes mellitus
