The Effects of Rosiglitazone and Pioglitazone on Serum Nitric Oxide Levels in Hypercholesterolemic Rats

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Introduction: Hypercholesterolemia plays an important role in atherosclerosis and related cardiovascular diseases. Endothelial cell damage is the basic mechanism for initiation and progression of atherosclerosis. There is strong evidence that hypercholesterolemia increases production of free radicals and leads to endothelial cell injury, which sets the stage for atherosclerosis. Nitric oxide (NO) is a very short-lived free radical synthesized in endothelial cells and causes the relaxation of smooth muscle cells adjacent to endothelial cells. Since NO has an important role in endothelial cell function, we aimed to investigate serum NO levels in hypercholesterolemic rats and the potential beneficial role of rosiglitazone and pioglitazone.

Methods: The animals were initially fed the chow pellets for 15 days, after the adaptation, the rats were divided into five groups (n=8). The control group (group I) fed basal diet during entire experiment period. All other animals fed with hypercholesterolemic diet which contains 2% (w/w) cholesterol and 1% cholic acid in basal diet for 8 weeks. The hypercholesterolemic group (group II) was continued taking hypercholesterolemic diet while the group III, IV and V received 1 mg and 4 mg Rosiglitazone and 3 mg pioglitazone respectively by oral gavage in addition to hypercholesterolemic diet for 3 weeks. All the animals were sacrificed at the end of 11 weeks. Blood samples were collected by cardiac puncture. Serum NO levels were measured by a modification of the Cadmium-reduction method

Results: Serum NO levels of control group**,** hypercholesterolemic group Rosiglitazone, and pioglitazone treated hypercholesterolemic groups were 26.9$\pm$ 3.35, 20.27$\pm$ 1.48, 25.03 $\pm$ 2.66, 26.5 $\pm$ 3.3, 23.56$\pm$ 3.9 μmol/L. respectively.

Conclusions: These results showed that both rosiglitazone and pioglitazone treatment increased serum NO levels of hypercholesterolemic rats. This beneficial effect of rosiglitazone was concentration dependent. TZDs may have a protective role against atherosclerosis in hypercholesterolemic rats by improving endothelial functions.