Investigation of aldose reductase inhibitory and anti-hyperglycemic potential of 2, 4-thiazolidinedione derivatives and evaluation of their protective effect against galactose induced and STZ diabetic cataract in rats.

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Cataract is viewed as a major cause of visual impairment in diabetic patients as the incidence and progression of cataract is elevated in patients with diabetes mellitus. This is the reason for highly required biochemical solutions or pharmacological intervention that will maintain the transparency of the lens and delay the progression of cataract. Polyol pathway has been implicated as a major contributor in the pathogenesis of diabetic cataract along with chronic hyperglycemia as the root cause. Male SD rats were selected for this study. In the present study, we have investigated the novel effect 2, 4- thiazolidinedione derivatives that have potential to inhibit the aldose reductase enzyme and to act as a ligand of PPAR-γ against galactose-induced and single dose (55 mg/kg i.e.) of streptozotocin induced diabetic cataract in rats. All the above models of cataract showed development of mature cataract in the disease control group at the end of the respective study. Levels of aldose reductase, polyols, sodium, calcium and malondialdehyde in the lens had significantly elevated whereas antioxidant enzymes, total proteins, soluble proteins and potassium levels had significantly decreased in disease control rats as compared to the age-matched control rats, this indicates the accelerated polyol pathway and associated oxidative stress in lens. The treatment with Compound A (80 and 200 mg/kg, p.o.) and compound B (80 and 200 mg/kg, p.o.) significantly ameliorated the alterations in polyol pathway and oxidative stress with clear delay in the onset and progression of cataract. Results of the present study suggest the potential of these compounds as pharmacological intervention against diabetic cataract.

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