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Protective effect of Catharanthus roseus leaf extract on streptozotocin induced oxidative damage in diabetic rat's brain

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Diabetic neuropathy is a complication of long term diabetes and it is estimated 60 % to 70 % of diabetics have mild to severe forms of nervous system damage and causes morbidity in diabetic patients. In diabetes mellitus, hyperglycemia is the most important factor in the onset and progress of diabetic complications mainly by producing oxidative stress and causes an imbalance in the oxidative status of nervous tissue and leads to micro vascular cerebral diseases. The reason for high risk of micro vascular cerebral diseases, despite the fact that brain consumes 20% of the oxygen in the body, is that it has a low content of antioxidants and high content of unsaturated fatty acids and catecholamine that are easily oxidized, making the brain more vulnerable to oxidative damage than any other organs in the body. Hyperglycemia induces the production of free radicals and causes excessive lipid peroxidation and alterations in antioxidant enzyme activities, which are the underlying causes of diabetic complications. This study was to investigate the possible neuroprotective effect of Catharanthus roseus leaf extract against streptozotocin-induced hyperglycaemia in the rat brain on lipid peroxidation in the brain of streptozotocin (STZ)-induced diabetic rats. Male rats weighing about 250–300 g were rendered diabetic by a single STZ injection of 50 mg/kg via the tail vein. Both the diabetic and non-diabetic rats were treated orally with C.roseus leaf extract 100 mg /kg). Eight weeks later, all rats from each group were killed and the brain was removed and used for biochemical studies. The level of lipid peroxidation in brain of streptozotocin-induced diabetic-untreated group increased significantly, whereas the activities of the antioxidant enzymes: glutathione reductase (GR); glutathione peroxidase (GPX); and superoxide dismutase (SOD) significantly decreased and glutathione S-transferase (GST) and Catalase (CAT) significantly increased in diabetic rat brain. Treatment with C.roseus significantly reduced lipid peroxidation and restored the antioxidant enzyme levels when compared to the streptozotocin-induced diabetic-untreated group. The current results suggest that C.roseus leaf extract exerts, efficiently, an attenuating effect on the progression of hyperglycemia and also on some diabetes-induced complications in rat brain caused due to oxidative damage.

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