

Pharmacological Evaluation of Vasant Kusumakar Rasa in High Fat Diet and Streptozotocin-Induced Diabetic Retinopathy in Rats

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Diabetic retinopathy is one of the important microvascular complications of diabetes. Vasant Kusumakar Rasa (VKR) is a promising herbo-mineral preparation from Ayurveda, a traditional system of medicine for the management of diabetes. The present study was designed to evaluate the efficacy of Vasant Kusumakar Rasa in type II diabetic retinopathy in rats. Type II diabetes was induced in *Sprague Dawley* rats by using a high-fat diet and a single dose of streptozotocin at 35 mg/kg, *i.p.* After confirmation of diabetes induction, the rats were treated with two doses of VKR (28 mg/kg and 56 mg/kg, *p.o.*) for 16 weeks. At the end of the study, various biochemical and oxidative stress parameters were assessed. Moreover, an electroretinogram (ERG) of all animals was recorded to study retinal physiology. In addition to this, the expression of key proteins MMP-2, MMP-9, and VEGF, was studied. Histopathological study of retinal tissue was also performed using hematoxylin and eosin staining. The administration of VKR at both doses, 28 and 56 mg/kg, exhibited a significant reduction in glucose, glycosylated hemoglobin, and insulin levels when compared to the diabetic control group. Furthermore, the higher dose of VKR, 56 mg/kg, notably decreased the elevated levels of aldose reductase and sorbitol dehydrogenase after the 16-week treatment period. VKR at both doses demonstrated a remarkable ability to prevent the changes in 'a' and 'b' wave amplitude and latency, thus preserving retinal function in comparison to the diabetic control group. Additionally, oxidative stress, a key player in the progression of diabetic retinopathy, was considerably reduced in diabetic animals following 16 weeks VKR treatment. Notably, the expression levels of MMP-2, MMP-9, and VEGF were decreased in the VKR-treated diabetic animals. These findings indicate the significant therapeutic effects of Vasant Kusumakar Rasa in the management of type II diabetic retinopathy.

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