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Cataractogenesis in nSTZ-induced type-2 diabetes rat model

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Type-2 diabetes is most common form of diabetes and it is considered to be one of the major risk factors of cataract. Most of the animal studies done on diabetic cataract were on type-1 diabetic animal models. Here we have made an attempt to evaluate neonatal streptozotocin (nSTZ) induced SD rat model for the development of type-2 diabetes and subsequently diabetic cataract. Two day old SD rat pups were injected STZ i.p at a dose of 90 mg/kg body weight. nSTZ injected animals developed impaired glucose tolerance (IGT) and pre-diabetes by the age of two months as evidenced by OGTT and post prandial glucose levels. Subsequently 30% of nSTZ rats developed hyperglycemia and mature cataract by the age of 7 months. Remaining 70% animals continued to show IGT throughout the experimental period and did not show observable lenticular opacification. There was a reduced beta cell mass by 50% and 80% in IGT and hyperglycemic rats respectively. Further lens biochemical analysis has shown increased polyol pathway as evidenced by increase in aldose reductase activity and sorbitol levels and also increased oxidative stress as there was an increased SOD activity and MDA levels in diabetic cataractous lens. Interestingly IGT rats lens also showed a marginal increase in sorbitol levels than control group which indicates lens abnormalities even at the IGT stage which may ultimately lead to lens opafication. Since most of these animals developed IGT, it can be used as IGT model and also to study IGT associated abnormalities in the lens.

Biography

Madhoosudan A. Patil is ICMR-SRF doing his PhD at the National Institute of Nutrition, Hyderabad, India. Topic of his doctoral work is evaluation of animal models for the study of diabetic complications.

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