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UNDERSTANDING DEVELOPMENT OF VASCULOPATHY IN DIABETIC MICROCIRCULATION ROLE OF ENDOTHELIAL PROSTANOIDS, PROSTACYLIN AND NITRIC OXIDE

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UNDERSTANDING DEVELOPMENT OF VASCULOPATHY IN DIABETIC MICROCIRCULATION – ROLE OF ENDOTHELIAL PROSTANOIDS, PROSTACYCLIN AND NITRIC OXIDE

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ABSTRACT (120 words)
This study aims to elucidate how endothelial dysfunction develops in diabetic microcirculation. The roles of endothelial derived factors that regulate blood vessel tone and homeostasis: prostacyclin, nitric oxide (NO), endothelium derived hyperpolarizing factors (EDHF) and endothelial prostanoids were studied in streptozotocin induced diabetic rats.
The first part of the project involved *In-vitro* vascular response studies to determine relative contributions of each endothelial NO, EDHF, prostacyclin and prostanoids mediated relaxation /contraction in normal and diabetic vessels. The second part were biochemical studies (western blot and immunohistochemistry) to determine presence and protein expression of the enzymes and receptors involved in synthesis and action of these factors. These experiments were conducted during early and late phases of diabetes.

1. INTRODUCTION & LITERATURE REVIEW

Diabetes is a global health problem and is associated with micro- and macrovascular complications. Diabetic microvasculopathy contributes to cardiovascular complications such as heart diseases, nephropathy, neuropathy and retinopathy. Endothelial cells line the inner blood vessel and releases endothelial derived factors (EDF) that dilate and contracts blood vessels; these substances also have pro and anti-atherogenic properties. Microcirculation is very important, as it is believed to show earliest manifestations of atherosclerosis. Diabetic endothelial dysfunction is characterized by the impairment of endothelium-dependent relaxations. The endothelium evokes relaxation of underlying smooth muscle through the production of endothelium-dependent relaxing factors (EDRF) including nitric oxide (NO), prostacyclin and endothelium-dependent hyperpolarization (EDH). Our co-investigators had shown that endothelial dysfunction in larger vessels such as aorta and femoral artery is due to imbalance in the release/availability of EDF; release of NO is impaired, while there was abnormal production of endothelial prostanoids (Shi & Vanhoutte, 2007). However, in