

Anti-Hyperglycemic And Antidyslipidemic Potential Of *Azadirachta indica* Leaf Extract In STZ- Induced Diabetes Mellitus

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Abstract:

Azadirachta indica, an Indian medicinal plant, has been studied for its role in diabetes and its effect on lipid profile. This study was conducted to elucidate whether treatment of *Azadirachta indica* leaf extract after streptozotocin (STZ) - induced diabetes has anti-hyperglycemic and anti-dyslipidaemic action or not. The experiment involved four groups of rat; one group was control group, second diabetic control, third diabetic group received alcoholic extract of *Azadirachta indica* and fourth diabetic group received Glibenclamide as a reference standard. Oral glucose tolerance test was performed before induction of diabetes. Blood was collected by retro-orbital puncture for glucose estimation, and to evaluate serum triglyceride, total cholesterol, HDL-cholesterol, LDL-cholesterol levels. Blood Glucose level as well as serum lipid profile parameters such as total-cholesterol, triglyceride, low-density lipoprotein and very low-density lipoprotein cholesterol were also elevated, whereas, the level of high-density lipoprotein-cholesterol was reduced significantly ($P < 0.05$) in diabetic rats. Ethanolic extract of *A. indica* after induction of diabetes, normalized glucose level and lipid profile. It can be concluded that STZ-induced hyperglycaemia can be ameliorated by treatment with ethanolic extract of *A. indica*. *A. indica* ethanolic leaves extract after diabetic induction, reverses dyslipidaemia.

Key words: *Diabetes mellitus, serum lipid, Streptozotocin, Azadirachta indica.*

Introduction:

India has one of the oldest, richest and diverse cultural traditions associated with the use of the plants and herbs for human, livestock and plant health. Many of the ingredients of Indian cooking which have been handed down from ages contain medicinal properties. A vast ethnobotanical knowledge exists in India from ancient times. However, very few plants used by locals for medicines are subjected to scientific investigation. The need for conservation of medicinal plants and traditional knowledge, particularly in developing countries like India, taking into account the socio cultural and economic conditions is urgent.[1]

Diabetes mellitus (DM) is a serious metabolic disease which has several complications including diabetic nephropathy, diabetic neuropathy, coronary heart disease and hypertension.[2] It has been estimated that by the year 2010, the prevalence of DM worldwide will reach approximately 240 million.[3] Patients with DM are more likely to develop and die from microvascular and macrovascular complications than the nondiabetic population.[4] There is usually an

association between coronary heart disease or atherosclerosis and dyslipidaemia.[5, 6] Dyslipidaemia is a frequent complication of DM and is characterized by low levels of HDL-cholesterol and high levels of LDL-cholesterol and triglyceride. Several groups of hypoglycaemic drugs are currently available to treat DM. However, their toxic side effects and sometimes diminution in response after prolonged use are problematic. Management of DM to avoid these problems is still a major challenge. In the indigenous Indian system of medicine, good number of plants was mentioned for the cure of diabetes and some of them have been experimentally evaluated and the active principles isolated.[7] However search for new antidiabetic drugs were continues.

Neem (*Azadirachta indica* A. Juss) is perhaps the most useful traditional medicinal plant in India. Each part of the neem tree has some medicinal property and is thus commercially exploitable. During the last five decades, apart from the chemistry of the neem compounds, considerable progress has been achieved regarding the biological activity and medicinal applications of neem. It is now considered as