

A Review of The Effect of Andrographis Panniculata On the Pancreas: Emphasis on Hyperglycemia.

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Cite this paper as: Neha Samphriya, Vijaylaxmi, Gajanand Pujari, Nagalaxmi (2024). A Review of The Effect of Andrographis Panniculata On the Pancreas: Emphasis on Hyperglycemia.. Frontiers in HealthInformatics, 13 (8) 1373-1375

Article Info

Article type:
Research

Article History:

Received: 2024-07-29

Accepted: 2024-09-12

Published: 2024-12-30

ABSTRACT

Andrographis paniculata (AG) is a plant well known in southern India for several of its medicinal properties and it is also called the king of bitter. This plant is often used as a part of traditional medicine in treatment of diabetes mellitus and detoxification of the body. The AG plant exhibits antibacterial, anti-inflammatory, anti-cancer, anti-hypertensive, hepatic and cardio protective properties. This study is a search on the consolidated effect of AG on hyperglycemia along with its overall effect on the pancreas .

INTRODUCTION

The Diabetes mellitus, an metabolic diseases, is a major health problem that has been increasing globally and has become a major health problem causing global concern for decades. High blood glucose levels being the centerpiece of the disease on a vital organ – the pancreas.

The Routine medications along with dietary charts have always been the treatment approach for Diabetes. There have been several countries in Asia that treat Diabetes with traditional medicine using locally available plants. One such plant is the Andrographis paniculata. Known for its strong bitter taste, it has been named as the “king of bitters”. There are limited documentations of the action of this drug in diabetes and on the pancreas as a whole. This study targets to compile the material available to enhance further scope for research of the same.

The *andrographis paniculata* Nees, belonging to the Acanthaceae family, is a plant known commonly as “Kalmegha” or king of Bitters. Mostly the leaves and root are used in Indian traditional medicine (Ayurveda, Siddha and Unani) for the treatment of wounds, ulcer, skin diseases, leprosy. The plant grows well in almost all type of soil and is abundantly found in Southeast Asia, India, Pakistan, Malayasia and Sri Lanka¹.

Botanical description:

AG is an annual and branched herbaceous plant with lanceolate, simple, opposite green leaves and quadrangular or tetragonal slightly winged stem and much branched and attains heights of 60-70 cm in moist shady place. The inflorescence of plant as patent terminal or axillary panicle and flowers are small, white purplish or violet marking possess small linear calyx, corolla narrow tube. The stamens two inserted in the throat, ovary 2-celled. The fruits are capsule, linear oblong two celled, compressed, longitudinally furrowed on broad faces. The plant seed are very small, 6-10 round or ovoid, yellowish brown. The plants root is cylindrical, curved taper 5-20cm long.

Vernacular names

Arabic: Quasabhuva, Azerbaijani: Acılar Şahı, Assamese: Kalmegh Acılar Xanı (khanı), Chinese: Chuan Xin Lian, Japanese: Senshinren, Hindi: Kirayat, Kalpanath, English: The Creat, King of Bitters, French: Chirette verte, Bengali: Kalmegh.²

DISCUSSION - AG ON PANCREAS:

Nugroho et al found that administering the purified extract of *Andrographis paniculata* (Burm. f.) Nees or its most active compound andrographolide for 5 days succeeded to decrease the levels of blood glucose, triglyceride, and LDL in Wistar Rats.³

Moreover, as stated by another study by Ajith kumar Thakur et al, in comparison to the vehicle-treated diabetic control group, AP or andrographolide treated ones had significantly lower blood glucose levels and higher blood insulin level.⁴

It has been documented by Chengliang Zhang et al that Andrographolide in *Andrographis paniculata* prevented type 1 diabetes by maintaining Th1/Th2/Th17 homeostasis and significantly suppressed the development of diabetes in NOD mice.⁵

While Renu Agarwal et al opined that the antidiabetic activity of *Andrographis paniculata* observed in the diabetic patients with a fall in HbA1c and fasting insulin level, was not because of its effect on the Islets of the pancreas that produce insulin but by the utilization of peripheral glucose by potentiating insulin action.⁶

Kikelomo Folake Jaiyesimi et al used polyphenolic rich extracts form of *A. paniculata* in diabetic rats and found that the serum insulin levels, hexokinase and glucose-6-phosphatase activities were significantly improved in the AG treated group compared to diabetic untreated control.⁷

Namphung Suemanotham et al investigated the effects of *Andrographis paniculata* on diabetic canines and stated that the herb had no significant effect on the diabetes mellitus parameters of diabetic canines or the control group canines in the study.⁸

An in vitro study using a glucose-responsive clonal insulin-secreting cell line (BRIN-BD11) produced by pancreatic β cell of rats was set up by Aris Wibudi et al. using water extract infusion of *Andrographis paniculata* to the BRIN-BD11. AG showed very strong effect of increased insulin secretion by glucose independent and dose dependant action.⁹

CONCLUSION:

AG effect on the pancreas show promising results in hyperglycemic conditions in various studies that involved rat experiments, human studies and cell line cultures. While the canine study did not show any significant effect of Ag, there is therefore more scope for further research of Ag in this field.

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