

Antidiabetic Effect of Karanja Seed Powder in Type-2 Diabetes Mellitus(DM)



Medical Science

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ABSTRACT

Madhumeha is a Vatika type of Prameha, it can be described as disease in which patient voids the urine having concordance with Madhu i.e. of Kasaya and Madhura taste, Ruksa texture and madhu (honey) like colour and body acquires sweetness so called Madhumeha. Diabetes Mellitus is a metabolic disorder with a group of symptoms like polyurea, polydipsia, hyperglycemia etc. Pongamia pinnata (L.) Pierre [family: Fabaceae] is a medium -sized glabrous tree popularly known as Karanja in Hindi, Indian beech in English and Pongam in Tamil. Karanja is indicated in Prameha in Samhita granthas and many Nighantus, due to its properties opposite to Samprapti ghatok of Madhumeha. This is an attempt to compile and document information on different aspect of Pongamia pinnata and its potential use as antidiabetic drug.

Introduction:

In Ayurvedic classics *Madhumeha* is described under heading of *Prameha Roga*. Ayurvedic scholars have referred *Madhumeha* as *Maharoga* or *Mahagada*. *Prameha* comprises a number of diseases with various physical and chemical changes in urine. The manifestation of this dreaded disease is described as *Prabhutavilmutrata*, means in which patient voids frequently copious urine with turbidity.(1,2) *Sushruta* has narrated the term *Ksaudrameha* in place of *Madhumeha* means in which patient voids urine similar to *Ksaudra* or *Madhu* (3)i.e. of *Kasaya* and *Madhura* taste and *Ruksa* texture and honey like colour. Further he narrated that when all the *Prameha* ill treated or neglected get converted into *Madhumeha*.(4,5)

Diabetes Mellitus is defined as the state of chronic hyperglycemia due to impairment of insulin secretion or its action. Diabetes mellitus (DM) comprises a group of common metabolic disorders that share the phenotype of hyperglycemia.

The most important demographic change to diabetes prevalence across the world appear to be the increase in the proportion of people >65 years. By the 2030 it is estimated that number of people with diabetes >64 age will be >82 million in developing countries and >48 million in developed countries.(6)

Long term Diabetes lead to several complications like diabetic retinopathy, neuropathy, nephropathy and several other so it is necessary to use such drugs which cure the Diabetes along with its complications.(7)

In this respect many drugs have been used for treatment of Diabetes. In the present work, the drug *Karanja* has been used for the management of *Madhumeha*. The selected drug *Karanja* is mentioned in Ayurvedic classics like *Caraka*, *Susruta*, *Vagbhata* and various *Nighantus*. In the traditional system of medicines, such as *Ayurveda* and *Unani*, the *Pongamia pinnata* plant is used for anti-inflammatory, anti-plasmodial, antinociceptive, anti-hyperglycemic, antilipidperoxidative, anti-diarrhoeal, anti-ulcer, antihyperammonic and antioxidant activity. (8)

Aims and objectives

To study the effect of *Karanja* seed powder in the management of *Madhumeha*.

Discussion

In prevedic era the Diabetes is described to have originated after consumption of *Havisa* of *Yajna* performed by *Daksa Prajapati*. Its inclusion in "*Asta Mahagada*" by *Caraka*, *Susruta* and *Vagbha* signifies the importance of the disease. "*Prameho*

Anusanginam", as considered by *Caraka* gives the clue for the adherent nature and poor prognosis of the disease.

The prevalence of type 2 Diabetes is increasing all over the world, it was estimated for all age group to be 2.8% in 2003 and 4.4% in 2030.

India has high prevalence of Diabetes and the number is increasing at an alarming rate. The most disturbing trend is the shift in age of onset of Diabetes to a younger age in the recent years. This could have long lasting adverse effects on nation's health and economy.

Our mission was launched with an aim to explore the possibility of a better control over Diabetes by *Karanja*.

Karanja has *Kasaya*, *Katu* and *Tikta Rasa*, *Tiksna* and *Laghu Guna*, *Katu Vipaka* and *Usna Virya*. It is *KaphaVatasamaka* and *Pittavardhaka*. All these properties make it suitable to combat *Madhumeha*.(9)

During review we found that different chemicals are also isolated from *Karanja* viz. *Karanjin*, pongapin, pongamol-chromeno chromene, furanoflavones and various other chemical constituents.

Ethnobotanical review reveals that different parts are used by many tribes all over the world to cure many diseases viz. Diabetes, diarrhea, skin diseases as scabies, dyspepsia, inflammation, leprosy, cough etc. In wound caused by poisonous fish it is used and also used in fever and jaundice. Botanically *Pongamia pinnata* (Linn.) Pierre is studied as source plant of *Karanja*.(10)

Madhumeha has been described as one among the 20 types of *Prameha* and is subtype of *Vataja Prameha*. It is *Tridosaja vyadhi*. *Abadhha Slesma* is particular *Dosa* in all types of *Prameha*. The clinical entity in which patient voids the urine having concordance with *Madhu* i.e. of *Kasaya* and *Madhura* taste, *Ruksa* texture and *Madhu* (honey) like colour and body acquires sweetness is called *Madhumeha*. Treatment of *Madhumeha* is difficult due to contradictory treatment of *Vata* (predominant *Dosa*) and *Meda* (predominant *Dusya*). Drugs which combate *Vata* will increase *Meda* and *Kapha* and vice-versa. In *Avaranjanya Madhumeha* the treatment must be such that it should not vitiate *Vata* and should clear *Avarana* also.

Karanja is indicated in *Prameha* by authors of many *Nighantus*. *Kapha*, *Abadhha Meda* and *Vata* are main factors in pathogenesis of *Madhumeha*. *Karanja* having *Katu*, *Tikta Rasa* and *Katu*

Vipaka alleviates *Kapha* and *Meda Dosa* involved in all types of *Prameha*. *Kasaya Rasa* of *Karanja* also allivates *Kapha* and being *Stambhana* it also decrease *Sarira gata Kleda* and useful in *Bahumutrata*. Because of its *Tiksna*, *Laghu Guna* and *Bhedana* action it is *Srotosodhaka*. Its *Usna Virya*, pacifies *Vata* and *Kapha*. It also has *Kapha Vatasamaka* action which is desirable in treatment of *Madhumeha*.

The test drug is effective in polyurea because of its *Kasaya Rasa* which is *Stambhana* and also reduces *Sarira Gata Kleda*. This result shows that trial drug proved better synergistically with Gliclazide.

It lowers the post prandial blood sugar (PPBS) might be due to its *Katu*, *Tikta Rasa* and *Katu Vipaka* which pacify *Kapha* and *Meda*. *Kapha* and *Meda* are the causative factors to increase *Madhuratva*. It may have Acarbose like action to which causes reduction in glucose absorption.

In all we can say that factors involved in *Madhumeha* (type 2 DM) are increase in *Meda* and *Kapha*, vitiation of *Vata* and *Dhatuk-*

saya chiefly. *Karanja* by virtue of *Tikta* and *Katu Rasa* alleviate *Meda* and *Kapha* main etiological factors involved in pathogenesis of disease. Being *Usna Virya* it pacify *Vata*, and by virtue of *Kasaya Rasa* it reduces *Sariragata Kleda*. This seems here it acts by *Guna Prabhava*. Improvement in physical strength observed in the test subjects could not be explained by its properties and action therefore, this benefit may be due to *Dravyaguna Prabhava*. So we may infer that the drug acted by both *Gunaprabhava* and *Dravyaprabhava*.

Medicinal importance

- Seed used for keloid tumors, used in hypertension, skin ailments and rheumatic arthritis. (11),(12),(13)
- Seed powder valued as a febrifuge, tonic and in bronchitis and whooping cough (14).
- Useful in inflammations, pectoral diseases, chronic fevers, hemorrhoids and anemia.(15).

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