

Research Article

Traditional Indigenous Medicine for Diabetes Among the Natives of Madhya Pradesh, India

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Introduction

The word diabetes is derived from a Greek word that means to siphon or drain off and mellitus, a Latin word means sweet. Indeed, the most obvious sign of diabetes being excessive urination and the urine of a person with diabetes contains extra glucose (F=more than 70 – 110 & PP= more than 90 – 140 mg/100 ml of blood). It is a state in which homeostasis of carbohydrate and lipid metabolism is improperly regulated by insulin. This result primarily in elevated fasting and postprandial blood glucose levels. If this imbalanced homeostasis does not retain to normalcy and continue for a protracted period, it leads to hyperglycaemia that is due to course turns into a syndrome called diabetes mellitus.

Clinically, it occurs due to deficiency of insulin hormone, produced by β -cells of islets of langerhans. There are mainly two type of diabetes, i.e. type 1 (insulin dependent and type 2 (insulin independent). Discharge of large amount of glucose containing urine, increase hunger, great thirst and loss of body weight are some diagnostic symptoms of this disease. The ailment also weakness the body's natural defence system and makes it more prone to infection by opportunistic germs. Tribal and rural people believe that hyperglycaemic disorder arises due to non or less secreting of insulin from the pancreas. Therefore, they prescribe the drugs which enhance the proper secretion of hormone and utilization of excess glucose in the blood.

Diabetes mellitus is an oldest disease known to mankind. However, the disease was well documented in Indian literatures like Sushruta Samhita (600 BC) and Charaka Samhita (1000 BC) and subsequent works refer to this disease under the term madhueha. Excellent work towards the herbs used in the treatment of various human ailments has been obtained from the different part of our country. Obviously, equivalent work on the herbs used to cure hyperglycaemic disorders and proper secretion of insulin among the natives of Madhya Pradesh has not been done, except some published reports by Aiman [1], Gupta et al. [2], Dhar [3], Bhargawa [4], Bailey and Dey [5], Dwivedi [6], Dwivedi [7] (2009) and Ong et al. [8] (2010). Moreover, a number of anti-diabetic herbs have been screened for their biological activity in both in-vitro and in-vivo assays to validate the clinical therapeutic effects [9]. The present study aims to create awareness towards the anti-diabetic herbs and draw attention of pharmacologists, researchers and phytochemists to investigate its bioactive constituents and biological assays to formulate the new herbal drugs for treatment of both type of diabetes.

Methodology

Thirty tribal localities were explored from 1.7.2015 to 30.6.2016 and information on anti-diabetic herbal drugs was gathered from tribal physicians and knowledgeable medicine men of various age and sex group. Voucher specimens were collected from different study sites and were identified with the assistance of State Forest Research Institute, Jabalpur (M.P.). Cross verification of the specimens were done with the help of relevant literature [10,11] and voucher specimens are deposited in Ethnobotanical Research Laboratory, Department of Botany, Janata Post- Graduate College, A.P.S. University, Rewa (M.P.). Method of preparation and mode of administration of the drug along with their dose, duration etc. were also obtained by the inhabitants, folk healers, tribal physicians and rural vaidyas.

Prescriptions and Treatment

For the treatment of diabetes following herbal prescriptions have been recommended:

1. The following herbs and their parts are used to prepare an oral powder: Table 1

A fine powder of the above herbs is made by grinding them together in a grinder. Two tea spoon full of this powder is to be taken twice in a day before meal till the glucose concentration in the blood comes up to normal level.

2. In another prescription they suggested the fresh parts of following herbs to prepare an herbal drink: Table 2

The exact amount of fresh parts of herbs crushed alongwith five seeds of kalimircha by adding 50 ml of drinking water, filtered it and recommended every morning on empty stomach. It is an excellent remedy to reduce the blood sugar up to normal level.

3. The leaves of *Cathranthes roseus* (Sadabahar) and *Enicostema hysopifolium* (Nahi) have possess anti-diabetic properties. Tribal and rural physicians prescribe fresh leaf juice (10:10 ml before meal,

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Table 1

Botanical Name	Common Name	Parts used	Amount (gm)
<i>Coriandrum sativum</i> L.	Dhania	Seed	50
<i>Mucuna pruriens</i> (L.) DC.	Kemanch	Seed	25
<i>Eugenia jambolana</i> L.	Jamun	Seed	50
<i>Trigonostema cordifolia</i> (L.) Merr.	Giloya	Stem	25
<i>Trigonella foenum-graecum</i> L.	Menthi	Seed	50
<i>Withania somnifera</i> (L.) Dunal.	Ashwagandha	Root	50
<i>Zingiber officinale</i> Rosc.	Adarakh	Rhizome	25

Table 2

Botanical Name	Common Name	Parts used	Amount (No./ gm)
<i>Aegle marmelos</i> (L.) Corr.	Bel	Leaf	05
<i>Andrographis paniculata</i> (Brum. F.) Wall. ex Nees.	Kalmegh	Leaf	05
<i>Annona squamosa</i> L.	Sitaphal	Leaf	09
<i>Azadirachta indica</i> A. Juss.	Neem	Leaf	08
<i>Boerhaavia diffusa</i> L.	Pharnaba	Whole plant	20 (g)
<i>Ocimum sanctum</i> L.	Tulsi	Leaf	21
<i>Piper nigrum</i> L.	Kalimircha	Seed	05

twice daily) to control the excess glucose in the blood. The treatment should be continuing up to the normal level.

4. About 10 gm leaf powder of *Gymnema sylvestre* (Gurmar) with 50 ml juice of fresh *Momordica charantia* (Kerela) before both meal is a native remedy for hyperglycemia. Fatty and spicy diet along with sugar containing fruits and meal should not be taking during the course of treatment. However, sprouted grains and the diet rich in proteins, fibres and carbohydrates is recommended.

5. The natives suggested 50 ml juice prepared by taking 10 fresh leaves of *Annona squamosa* (Sitafal) every morning on empty stomach to control the level of glucose in the blood.

6. The rural physicians come across the modern world recommended stevia (3-5 leaves during meal) as an alternative to sugar. It has anti-diabetic effect and lowers the high blood glucose levels in both type of diabetes.

Results and Discussion

The herbs used in the treatment of diabetes are common, easily available and cheaper. The method of preparation and mode of administration of drug is very simple and convenient. The tribal and rural people below poverty status can also afford the treatment. They believe that most of the ills and sickness are due to evil spirits and often seek the aid of magical practices and religious rites. However, they have adequate knowledge of herbal remedies and have deep faith on it.

Hyperglycemic disorder occurs due to the deficiency of insulin hormone, resulting increase of glucose level in the blood. Herbal medicine obtained from various valuable plants occurring in and around the tribal huts has better solution for this disease [12] *Aegle marmelos* (Bel), a sacred and religious plant is very commonly used in digestive and urinary complaints. The active constituent of the fruit is marmosin. Due to presence of alkaloids, coumarins, sterols and aegelin it is best of all laxatives and used in diarrhoea and dysentery. The leaves contain skimianin, sterol and aegelin and have anti-diabetic properties [13]. *Azadirachta indica* (Margosa) played a key role in folk medicine. The bitter constituent separated from this plant is nimbin, which is traditionally used for treating cardiac and hepatic complaints and also as a barrier contraceptive of tribals. The main active principle of seed oil is nimbidin, which contain sulphur and have been found to possess anti-fertility activity by various routes. Scientific investigations revealed its anti-pyretic, anti-fertility and

hypoglycemic activities [12,14]. Panchang of *Boerhaavia diffusa* (Punarnaba) have been used in several preparations has also found wide acceptance in modern medicine as a diuretic and laxative herb, due to presence of large quantities of potassium salts. The herb contains a crystalline acid known as boerhavic acid. Besides, potassium nitrate and a brown mass containing of tannins, phlobaphens and reducing sugar have been also reported [15]. The active principle is alkaloid punnaravine. Whole plant of this herb has also been used to control the excess glucose in the blood [7]. Seeds of *Mucuna pruriens* (Kemanch) are used to treat sexual impotency and male sterility has been found to have stimulatory effect on semen formation. It also increases the peristaltic movement of intestine; maintain blood pressure and control heart beat [11]. It has been found to have hypoglycemic effect and prescribed for the treatment of diabetes [16].

A sacred and religious herb *Ocimum sanctum* (Tulsi) grown in most Hindu homes, is a native remedy for pyrexia, earache, measles, dental, pulmonary and skin complaints, due to its antibiotic, antipyretic and antibacterial activities. The leaves yield an essential oil which contain eugenol, carvacrol, methyl eugenol, cryophyllene, urosolic acid, apigenin, luteolin, glucuronid, orientin and molludistin. The leaves are immunomodulating and possess excellent anti-diabetic properties [17]. *Tinospora cordifolia* (Giloya) is known as amrita, is a very popular herbal drug used in several complaints including general debility, malaria, diabetes, jaundice, gynaecological and joint diseases. Gupta [2] has recognized about favorable indigenous insulin secretion and glucose uptake of the drug. Antiviral and antibacterial activity of the herb has been reported by Husain et al. [18]. The seeds of *Trigonella foenum-graecum* (Fenugreek) are carminative and prescribed in abdominal disorders, viz., indigestion, flatulence, sluggish liver. Also, quite useful in treating arthritis, low backache, sciatica and muscular pains. Recent clinical trials confirming that methi seeds and leaves possess good anti-diabetic properties [19,20] and have inspired the pharmaceutical companies to come up with many new herbo-mineral combinations which contain methi in suitable forms.

Withania somnifera (Ashwagandha) is a magic herb used by the tribals and rural people. They mention it invariably in all prescriptions, calling divine gift. It is used in several combinations for the treatment of general debility, respiratory and urinary ailments. Excellent medicinal properties are due to presence of alkaloid somniferine with glycosides and amino acids. Recent experiments have shown that its roots possess antibiotic, antibacterial, immune-modulating and anti-hyperglycemic properties [21]. Almost all part of *Momordica charantia* including fruits and seeds [22,23] and seeds of *Eugenia jambolana* [24] have possess anti-diabetic activity Likewise, the leaves of *Andrographis paniculata*, *Annona squamosa*, *Catharanthus roseus*, *Enicostema hysopifolium*, *Gymnema sylvestre*, and the seeds of *Coriandrum sativum*, and *Piper nigrum* have long been used in traditional medicine for the treatment of hyperglycaemic disorders [23,25]. Antihyperglycemic effect of *Stevia rebusiana* was observed by Gregerson et al. [26]. Obviously, stevioside may increase the insulin secretion in part of production of gene involve in glycolysis [27].

It has been realized that medicinal herbs are going to play a very important role in future health care system. Most of modern researches on herbal medicine have hinged around traditional folklore medicine [28]. We stand today at the crossroad of ancient traditions and modern advancement with regards to medicine. The modern medicine has brought it host of drug, none of which is non-toxic and hundred percentages safe for us and some of them even causes irreversible damage to our body system. It has also no answer to some the diseases ailing the humanity [29]. On the contrary the herbal medicines are safe, without any toxic effect and have answer for dreaded diseases too.

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