

The Effect of Herbs by Charantin Product for Controlling the Blood Sugar Levels among Diabetic Patients in Ubon Ratchathani Province

Chuthamat Baokhumkong¹, Pramee Supmee²

¹(Faculty of Public Health, Ubon Ratchathani Rajabhat University, Ubon Ratchathani Thailand)

²(Pramee Supmee Co.,Ltd, Bangkok Thailand)

Abstract: This research aims to study the effect of herbs by Charantin product for controlling the blood sugar levels among diabetic patients in Ubon Ratchathani province. This research is a qualitative research to track the use of herbs to control blood sugar levels in patients with type 2 diabetes who were the 166 persons and compared the blood sugar levels before and after taking the herbal diabetes treatment between July and December 2558. In-depth interviews and records of monitoring blood glucose levels were used to be the tool to track the result of herb effect by measure and interview one time before taking herb and three times after taking herb. There were four types of herbs used including bitter melon, garlic, holy basil and neem eaten by the patient in the form of tea and capsule by Charantin product. The results showed that the blood sugar levels of 166 patients before taking herbal diabetes treatment by Charantin product were at the high level with the blood sugar level of 360.67, the low level with the blood sugar level of 180.85 and the average blood sugar level of 290.67. After taking the herbal treatment of diabetes in the first to second, third to fourth and fifth to sixth month the blood sugar levels were dropping and the average blood sugar levels of participants in each month were 165.00, 154.00, and 127.67, respectively. The symptoms and complications caused by diabetes symptoms were also improved. The study reveals that these herbs by Charantin product can increase efficiency and reduce blood glucose levels and symptoms and complications of diabetes. However, the use of herbs to treat diabetes effectively and safely should pay attention to the cleanliness and should be guided by health authorities in order to maintain the efficiency and reduce the cost of treatment of the patients.

Keywords: herbal diabetes treatment, diabetes type 2, diabetes.

I. Introduction

Type 2 diabetes used to be called adult-onset diabetes, but is becoming more common in children. This form of diabetes is caused when your body either resists insulin or doesn't produce enough. It causes your blood glucose levels to be unbalanced. There is no cure. However, many people are able to manage their blood glucose levels with diet and exercise. If not, a doctor can prescribe medications that can manage blood sugar levels. Some of these medications are healthy diet, physical activity, and maintaining a healthy weight are the first, and sometimes, most important part of diabetes treatment. However, when those are not enough to maintain your blood sugar levels, your doctor can decide which medications will work best for you. Along with these treatments, people with diabetes have tried numerous Thai herbs and supplements to improve their diabetes. These alternative treatments are supposed to help control blood sugar levels, reduce resistance to insulin, and prevent diabetes-related complications. Some supplements have shown promise in animal studies. However, there is currently only limited evidence that they have the above mentioned benefits in humans. It is always best to let the foods you eat provide your vitamins and minerals. However, more and more people are turning to alternative medicines and herb product. In fact, according to the Thai diabetes association diabetics are more likely to use Thai herb than those without the disease. Thai herbs product should not be used to replace standard diabetes treatment. Doing so can put your health at risk. It is important to talk to your doctor before using any Thai herb. Some of these products can interfere with other treatments and medications. Just because a product is natural does not mean it is safe to use A number of Thai herb have shown promise as diabetes treatments. These include the following the bitter melon is used to treat diabetes-related conditions in countries like Asia, South America, and others. There is a lot of data on its effectiveness as a treatment for diabetes in animal and lab studies. However, there is limited human data on bitter melon¹. There are not enough clinical studies on human. The human studies currently available are not of high quality. The Thai herbs contains poly phenols, which are antioxidants. The main antioxidant in Thai herbs is known as epigallocatechin gallate (EGCG). Laboratory studies have suggested that EGCG may have numerous health benefits including lower cardiovascular disease risk, prevention of type 2 diabetes, improved glucose control and better insulin activity. Studies on diabetic patients have not shown health benefits². However, Thai herbs is generally considered safe.

Thai herbs are being looked up once again for the treatment of diabetes. Many conventional drugs have been derived from prototypic molecules in medicinal plants. Metformin exemplifies an efficacious oral glucose-lowering agent. Its development was based on the use of *Galega officinalis* to treat diabetes. *Galega officinalis* is rich in guanidine, the hypoglycemic component. Because guanidine is too toxic for clinical use, the alkyl biguanides synthalin A and synthalin B were introduced as oral anti-diabetic agents in Europe in the 1920s but were discontinued after insulin became more widely available. However, experience with guanidine and biguanides prompted the development of metformin. To date, over 400 traditional plant treatments for diabetes have been reported, although only a small number of these have received scientific and medical evaluation to assess their efficacy. The hypoglycemic effect of some herbal extracts has been confirmed in human and animal models of type 2 diabetes. The World Health Organization Expert Committee on diabetes has recommended that traditional medicinal herbs be further investigated³.

Major hindrance in amalgamation of herbal medicine in modern medical practices is lack of scientific and clinical data proving their efficacy and safety. There is a need for conducting clinical research in herbal drugs, developing simple bioassays for biological standardization, pharmacological and toxicological evaluation, and developing various animal models for toxicity and safety evaluation. It is also important to establish the active component/s from these plant extracts.

II. Research Objective

This research aims to determine the Thai herbs used including bitter cucumber, garlic, holy basil and neem and aims to study the effect of herbs by Charantin product for controlling the blood sugar levels among diabetic patients in Ubon Ratchathani province.

III. Research Methodology

Method and Sample size

This research is a qualitative research to track the use of herbs to control blood sugar levels in patients with type 2 diabetes who were the 166 persons and compared the blood sugar levels before and after taking the herbal diabetes treatment between July and December 2558. In-depth interviews and records of monitoring blood glucose levels were used to be the tool to track the result of herb effect by measure and interview one time before taking herb and three times after taking herb. There were four types of herbs used including bitter gourd, garlic, holy basil and neem eaten by the patient in the form of tea and capsule by Charantin product.

Data analysis

Analyze data to characterize the general descriptive statistics include percentage, mean, standard deviation, median compared the blood sugar levels before and after taking the herbal diabetes treatment.

IV. Results

The Thai herbs for used including bitter gourd, garlic, holy basil and neem by the patient in the form of tea and capsule by Charantin product.

Bitter gourd

The bitter gourd is commonly used as an antidiabetic and antihyperglycemic agent in Thailand as well as other Asian countries. Extracts of fruit pulp, seed, leaves and whole plant was shown to have hypoglycemic effect in various animal models. Polypeptide p, isolated from fruit, seeds and tissues of bitter gourd showed significant hypoglycemic effect when administered subcutaneously to langurs and humans⁴. Ethanolic extracts of bitter gourd (200 mg/kg) showed an antihyperglycemic and also hypoglycemic effect in normal and STZ diabetic rats. This may be because of inhibition of glucose-6-phosphatase besides fructose-1, 6-biphosphatase in the liver and stimulation of hepatic glucose-6-phosphate dehydrogenase activities⁵.

Garlic

This is a perennial herb cultivated throughout Thailand. Garlic, a sulfur-containing compound is responsible for its pungent odour and it has been shown to have significant hypoglycemic activity⁶. This effect is thought to be due to increased hepatic metabolism, increased insulin release from pancreatic beta cells and/or insulin sparing effect⁷. Aqueous homogenate of garlic (10 ml/kg/day) administered orally to sucrose fed rabbits (10 g/kg/day in water for two months) significantly increased hepatic glycogen and free amino acid content, decreased fasting blood glucose, and triglyceride levels in serum in comparison to sucrose controls⁸. S-allyl cystein sulfoxide (SACS), the precursor of allicin and garlic oil, is a sulfur containing amino acid, which controlled lipid peroxidation better than glibenclamide and insulin. It also improved diabetic conditions. SACS also stimulated *in vitro* insulin secretion from beta cells isolated from normal rats⁹. Apart from this, Garlic exhibits antimicrobial, anticancer and cardioprotective activities.

Holy basil

It is commonly known as holy basil. Since ancient times, this plant is known for its medicinal properties. The aqueous extract of leaves of holy basil showed the significant reduction in blood sugar level in both normal and alloxan induced diabetic rats¹⁰. Significant reduction in fasting blood glucose, uronic acid, total amino acid, total cholesterol, triglyceride and total lipid indicated the hypoglycemic and hypolipidemic effects of holy basil in diabetic rats¹¹. Oral administration of plant extract (200 mg/kg) for 30 days led to decrease in the plasma glucose level by approximately 9.06 and 26.4% on 15 and 30 days of the experiment respectively. Renal glycogen content increased 10 fold while skeletal muscle and hepatic glycogen levels decreased by 68 and 75% respectively in diabetic rats as compared to control¹². This plant also showed antiasthmatic, antistress, antibacterial, antifungal, antiviral, antitumor, gastric antiulcer activity, antioxidant, antimutagenic and immunostimulant activities.

Neem

Hydroalcoholic extracts of this plant showed anti-hyperglycemic activity in streptozotocin treated rats and this effect is because of increase in glucose uptake and glycogen deposition in isolated rat hemidiaphragm¹³⁻¹⁴. Apart from having anti-diabetic activity, this plant also has anti-bacterial, antimalarial, antifertility, hepatoprotective and antioxidant effects¹⁵.

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The results showed that the samples of 166 males 79 to 47.60 percent and women 87 percent, 52.4 0 average age of 54.62 years (SD = 6.139) groups had before taking herbal diabetes treatment by Charantin product were at the high level with the blood sugar level of 360.67, the low level with the blood sugar level of 180.85 and the average blood sugar level of 290.67, as shown in Table 1. After taking the herbal treatment of diabetes in the first to second, third to fourth and fifth to sixth month the blood sugar levels were dropping and the average blood sugar levels of participants in each month were 165.00, 154.00, and 127.67, as shown in Table 2.

Table 1- The blood sugar level before taking herbal diabetes treatment by Charantin product

	The blood sugar level (N=166)		
	The high level (mg./dl.)	The low level (mg./dl.)	the average blood sugar level (mg./dl.)
Before taking herbal diabetes treatment	360.67	180.85	290.67

Table 2- The blood sugar level after taking herbal diabetes treatment by Charantin product

	The blood sugar level (N=166)		
	July-August (mg./dl.)	September-October (mg./dl.)	November-December (mg./dl.)
After taking the herbal treatment	165.00	154.00	127.67

V. Discussion

The study also found that groups had before taking herbal diabetes treatment by Charantin product were at the high level with the blood sugar level of 360.67, the low level with the blood sugar level of 180.85 and the average blood sugar level of 290.67, as shown in Table 1. After taking the herbal treatment of diabetes in the first to second, third to fourth and fifth to sixth month the blood sugar levels were dropping and the average blood sugar levels of participants in each month were 165.00, 154.00, and 127.67.

Charantin product marketed by Pramee Supmee, contains epicatechin, a benzopyran, as an active principle. Epicatechin increases the cAMP content of the islet, which is associated with increased insulin release. It plays a role in the conversion of proinsulin to insulin by increasing cathepsin activity. Additionally it has an insulin-mimetic effect on osmotic fragility of human erythrocytes and it inhibits Na/K ATPase activity from patient's erythrocytes. It corrects the neuropathy, retinopathy and disturbed metabolism of glucose and lipids. It maintains the integrity of all organ systems affected by the disease¹⁶. It is reported to be a curative for diabetes, Non Insulin Dependant Diabetes Mellitus (NIDDM) and a good adjuvant for Insulin Dependant Diabetes Mellitus (IDDM), in order to reduce the amount of needed insulin. It is advised along with existing oral hypoglycemic drugs. And is known to prevent diabetic complication. It has gentle hypoglycemic activity and hence induces no risk of being hypoglycemic¹⁷.

Bitter gourd powder marketed by Garry and Sun. It lowers blood & urine sugar levels. It increases body's resistance against infections and purifies blood. Bitter Gourd has excellent medicinal virtues. It is antidotal, antipyretic tonic, appetizing, stomachic, antibilious and laxative¹⁸. The bitter Gourd is also used in

native medicines of Asia and Africa. The Bitter gourd is specifically used as a folk medicine for diabetes. It contains compounds like bitter glycosides, saponins, alkaloids, reducing sugars, phenolics, oils, free acids, polypeptides, sterols, 17-amino acids including methionine and a crystalline product named p-insulin¹⁹⁻²⁰. It is reported to have hypoglycemic activity in addition to being antihemorrhoidal, astringent, stomachic, emmenagogue, hepatic stimulant, anthelmintic and blood purifier.

Charantin product, a formulation of Pramee Supmee, available in the capsule form is an anti-diabetic with combination of proven anti-diabetic fortified with potent immunomodulators, antihyperlipidemics, anti-stress and hepatoprotective of plant origin. The formulation of Diabeta is based on ancient ayurvedic references, further corroborated through modern research and clinical trials. Diabeta acts on different sites in differing ways to effectively control factors and pathways leading to diabetes mellitus. It attacks the various factors, which precipitate the diabetic condition, and corrects the degenerative complications, which result because of diabetes. Diabeta is safe and effective in managing Diabetes Mellitus as a single agent supplement to synthetic anti-diabetic drugs. Diabeta helps overcome resistance to oral hypoglycemic drugs when used as adjuvant to cases of uncontrolled diabetes. Diabeta confers a sense of well-being in patients and promotes symptomatic relief of complaints like weakness, giddiness, pain in legs, body ache, polyuria and pruritis.

Thus many different plants have been used individually or in formulations for treatment of diabetes and its complications. One of the major problems with this herbal formulation is that the active ingredients are not well defined. It is important to know the active component and their molecular interaction, which will help to analyse therapeutic efficacy of the product and also to standardize the product. Efforts are now being made to investigate mechanism of action of some of these Thai plants using model systems.

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References

- [1] Grover J.K., Yadav S., Vats V. Medicinal plants of India with antidiabetic potential. *J. Ethnopharmacol.* 2002;81:81–100.
- [2] Scartezzini P., Sproni E. Review on some plants of Indian traditional medicine with antioxidant activity. *J. Ethnopharmacol.* 2000;71:23–43.
- [3] Ramachandran A., Snehalatha C., Viswanathan V. Burden of type 2 diabetes and its complications- the Indian scenario. *Curr. Sci.* 2002;83:1471–1476.
- [4] Khanna P., Jain S.C., Panagariya A., Dixit V.P. Hypoglycemic activity of polypeptide- p from a plant source. *J. Nat Prod.* 1981; 44: 648–655.
- [5] Shibib B.A., Khan L.A., Rahman R. Hypoglycemic activity of *Coccinia indica* and *Momordica charantia* in diabetic rats: depression of the hepatic gluconeogenic enzymes glucose-6-phosphatase and fructose-1, 6-biphosphatase and elevation of liver and red-cell shunt enzyme glucose-6-phosphate dehydrogenase. *Biochem. J.* 1993;292:267–270.
- [6] Sheela C.G., Augusti K.T. Antidiabetic effects of S-allyl cysteine sulphoxide isolated from garlic *Allium sativum* Linn. *Indian J. Exp. Biol.* 1992;30:523–526.
- [7] Bever B.O., Zahnd G.R. Plants with oral hypoglycemic action. *Quart. J. Crude Drug Res.* 1979;17:139–146.
- [8] Zacharias N.T., Sebastian K.L., Philip B., Augusti K.T. Hypoglycemic and hypolipidaemic effects of garlic in sucrose fed rabbits. *Ind. J. Physiol. Pharmacol.* 1980; 24:151–154.
- [9] Augusti K.T., Shella C.G. Antiperoxide effect of S-allyl cysteine sulfoxide, an insulin secretagogue in diabetic rats. *Experientia.* 1996;52:115–120.
- [10] Vats V., Grover J.K., Rathi S.S. Evaluation of antihyperglycemic and hypoglycemic effect of *Trigonella foenum-graecum* Linn, *Ocimum sanctum* Linn and *Pterocarpus marsupium* Linn in normal and alloxanized diabetic rats. *J. Ethnopharmacol.* 2002;79:95–100.
- [11] Rai V., Iyer U., Mani U.V. Effect of Tulasi (*Ocimum sanctum*) leaf powder supplementation on blood sugar levels, serum lipids and tissue lipid in diabetic rats. *Plant Food For Human Nutrition.* 1997;50:9–16.
- [12] Vats V., Yadav S.P. Grover, Ethanolic extract of *Ocimum sanctum* leaves partially attenuates streptozotocin induced alteration in glycogen content and carbohydrate metabolism in rats. *J. Ethnopharmacol.* 2004;90:155–160.
- [13] Chattopadhyay R.R., Chattopadhyay R.N., Nandy A.K., Poddar G., Maitra S.K. Preliminary report on antihyperglycemic effect of fraction of fresh leaves of *Azadiracta indica* (Beng neem) *Bull. Calcutta. Sch. Trop. Med.* 1987;35:29–33.
- [14] Chattopadhyay R.R., Chattopadhyay R.N., Nandy A.K., Poddar G., Maitra S.K. The effect of fresh leaves of *Azadiracta indica* on glucose uptake and glycogen content in the isolated rat hemidiaphragm. *Bull. Calcutta. Sch. Trop. Med.* 1987;35:8–12.
- [15] Biswas K., Chattopadhyay I., Banerjee R.K., Bandyopadhyay U. Biological activities and medicinal properties of neem (*Azadiracta indica*) *Curr. Sci.* 2002;82:1336–1345.
- [16] Chakrabarti S., Biswas T.K., Rokeya B., Ali L., Mosihuzzaman M., Nahar N., Khan A.K., Mukherjee B. Advanced studies on the hypoglycemic effect of *Caesalpinia bonducella* F. in type 1 and 2 diabetes in Long Evans rats. *J. Ethnopharmacol.* 2003;84:41–46.
- [17] Sharma S.R., Dwivedi S.K., Swarup D. Hypoglycemic, antihyperglycemic and hypolipidemic activities of *Caesalpinia bonducella* seeds in rats. *J. Ethnopharmacol.* 1997;58:39–44.
- [18] Kannur D.M., Hukkeri V.L., Akki K.S. Antidiabetic activity of *Caesalpinia bonducella* seed extracts in rats. *Fitoterapia.* In press.
- [19] Yadav P., Sarkar S., Bhatnagar D. Lipid peroxidation and antioxidant enzymes in erythrocytes and tissues in aged diabetic rats. *Thai J. Exp. Biol.* 1997;35:389–392.
- [20] Agarwal V., Chauhan B.M. A study on composition and hypolipidemic effect of dietary fiber from some plant foods. *Plant Foods Human Nutr.* 1988;38:189–197.