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ROLE OF MOMORDICA CHARANTIA IN MANAGEMENT OF METABOLIC DISORDERS ASSOCIATED WITH MODERN DAY LIFE STYLES

Dr.PRITAM RAMESH MEHER

Associate Professor ,Department of Kayachikitsa,BSDT ,Ayurved Mahavidyalaya,Wagholi ,Pune

Email : dr.pritammeher26@gmail.com

ABSTRACT

Medicinal plants and its products continue to be an important therapeutic aid for alleviating the ailments of human kind. Momordica charantia, also known as bitter melon, Karela, balsam pear, or bitter gourd, is a popular plant used for the treating of diabetesrelated conditions amongst the indigenous populations of Asia, South America, India, the Caribbean and East Africa.[11] Its fruit has a distinguishing bitter taste, which is more pronounced as it ripens, hence the name bitter melon or bitter gourd.In present article we are discussing regarding the importance of Momordica Charantia In Management Of Metabolic Disorders

Keywords: M Charantia ,Management disorders

INTRODUCTION

Momordica charantia L., also known as bitter gourd, bitter melon, or karela, is an annual climbing plant of the family Cucurbitaceae. It is native to East India and is widely grown and eaten in tropical, subtropical, and temperate regions at present. The vegetable is light green with a long cone shape; it tastes bitter but is popular for its various benefits [1]. There are many nutrients in this plant [2, 3]. With the deepening of research on MC, numerous phytochemicals have been discovered, including saponins, polysaccharides, triterpenes, proteins, vitamins, minerals, flavonoids, ascorbic acid, and steroids. Besides, multiple biological characteristics have also been confirmed, such as antioxidant, hypoglycemic, antitumor, antibacterial [4], skin care anthelmintic, neuroprotective, anti-inflammatory, antiviral, immunomodulatory, wound healing promoting, antimutagenic, antiulcer, liver protection, and antiobesity activities. It commonly serves as four dosage forms: fruit juice, freeze-dried powder, entire fruit, or capsule, and the preparations are mainly crude extracts (usually extracted with water, ethanol, or methanol) and effective monomer components extracted from its fruit, seeds, or leaves.

Madhumeha (Prameha) Ayurvedic remedies for Madhumeha (diabetes mellitus) are the oldest among all the available therapies, which includes in the Prameha category. Pramehas are a list of urinary disorders, especially characterized by profuse urination with several abnormal

qualities due to Doshic imbalances. The word Prameha is derived from, Pra – means excess, Meha – ksharane - passing of urine. So Prameha is passing excessive urine and turbid in color ('prabhootha avila mootrata'). The main causes of Prameha are lack of exercise and improper food habits in excess food intake which falls in the category of Ushna, Snigdha and guru are the primal cause of this disease - Fish, curd are good example. Foods that increase Kapha, Medhas and Moothra are the etiological factors for Prameha. Main causes Sleeping in day time, lack of exercise, Laziness, Sedentary habits, consumes food and drinks which are cold, unctuous, sweet and fatty items etc, (Fat rich Diet). The main constituents of bitter melon which are responsible for the antidiabetic effects are triterpene, proteid, steroid, alkaloid, inorganic, lipid, and phenolic compounds. Several glycosides have been isolated from the *M. charantia* stem and fruit and are grouped under the genera of cucurbitanetype triterpenoids. [15] *M.charantia* fruits consist glycosides, saponins, alkaloids, reducing sugars, resins, phenolic constituents, fixed oil and free acids. *M. charantia* consists the following chemical constituents including alkaloids, charantin, charine, cryptoxanthin, cucurbitins, cucurbitacins, cucurbitanes, cycloartenols, diosgenin, elaeostearic acids, erythrodiol, galacturonic acids, gentisic acid, goyaglycosides, goyasaponins, guanylate cyclase inhibitors, gypsogenin, hydroxytryptamines, karounidiols, lanosterol, lauric acid, linoleic acid, linolenic acid, momorcharasides, momorcharins, momordenol, momordicilin,

momordicin, momordicinin, momordicosides, momordin, momordolo, multiflorenol, myristic acid. [16] The major compounds that have been isolated from bitter melon and identified as hypoglycemic agents include charantin, polypeptide-p and vicine. Charantin is a typical cucurbitane-type triterpenoid in *M. charantia* and is a potential substance with antidiabetic properties. [17] Polypeptide-p Bitter melon is one of the most commonly used vegetable that contains polypeptide-p and is used to control diabetes naturally. Polypeptide-p or p-insulin is an insulin-like hypoglycemic protein, shown to lower blood glucose levels in gerbils, langurs and humans when injected subcutaneously. [18] Vicine The other major compound that has been isolated from the seeds of bitter melon is a glycol alkaloid known as vicine. [19] Medicinal Properties of *M. Charantia* Bitter melon is traditionally known for its medicinal properties such as antidiabetic, anticancer, anti-inflammation, antiviral, and cholesterol lowering effects. It contains many phenolic compounds that may have the potential as antioxidant and antimutagen. The fruit, stems, leaves and roots of bitter melon have all been used in traditional medicine to help treat ailments such as hyperlipidemia, digestive disorders, microbial infections and menstrual problems. Bitter melon has been shown to possess powerful antiviral properties that can stimulate the immune system and activate the body's natural killer cells to help fight off viruses such as white spot syndrome virus and human

immunodeficiency virus. [20,21] Like most fresh vegetables, bitter melon is low in calories, and as such great for weight-loss. In Ayurveda, bitter melon juice has long been used as a solution for diabetic issues and liver organ issues. It stimulates liver for secretion of bile juices that are very essential for metabolism of fats. Bitter melon contains a chemical called charantin which lowers the urine and blood glucose levels, and hence the best home remedy for diabetes. The health benefits of bitter melon are greater than those of many vegetables. It has numerous vital nutritional supplements including vitamin A, Vitamin B1, Vitamin B2, Vitamin C, Iron, Calcium, Phosphorus, Copper and Potassium. It energizes the appetite, cleanses the liver, purifies the blood and provides many other benefits. [22] It consists of lot of nutritional value like vitamins, minerals and trace elements like vitamin C, iron, zinc, potassium, calcium and phosphorus containing lots of fibers. It is also having low calories and it is effective in weight loss. It also consists of chemical known as charantin which lowers the high blood glucose levels. It is very effective and excellent in source of various health benefits flavonoids i.e. beta-carotene, alpha-carotene, lutein and zeaxanthin. [23] Anti-diabetic Effect of *M. Charantia* There are many traditional herbal remedies that have been used to treat diabetes in Asia and other developing countries. *M. charantia* is one of the plants that has been investigated thoroughly for the treatment of diabetes. With the traditional use supported by modern scientific evidence of the beneficial function of *M.*

charantia, it is one of the most promising plants for diabetes today. [24] Investigation of the traditional uses of *M. charantia* in India revealed that it is one of the most important plant for lowering blood glucose levels in patients with diabetes. Juice of Bitter melon/Karela may be taken on empty stomach daily in the early morning. Its help in lowers down the blood glucose as it consists of chemical known as Charantin which help in lowering blood glucose levels, so it is very effective for diabetic person. It leads to influence the glucose metabolism all over the body not than other drugs which only target one organ or tissue. It generally consists of anti-oxidants that will lead to fight the body against complications that are generally seen in diabetic person. The seeds of this plant consist of plant insulin known as polypeptide – P, which lowers the insulin production by the human pancreas and reduces ones sugar levels. [25] *M. Charantia* and Glucose Metabolism Insulin plays a major biochemical role in stimulating the uptake of glucose by different cells of the body for the production of energy. Since *M. charantia* and its various extracts and components have been reported to exert hypoglycemic effects, and then it is important to understand whether *M. charantia* may have a direct effect in inducing a reduction in blood glucose level. [26] 1. Lowers Blood Glucose Levels As stated earlier, bitter gourd has been found to be effective in lowering blood glucose levels. Instead of targeting one particular organ or tissue like medicinal drugs, bitter gourd facilitates glucose

metabolism in the entire body. This can be attributed to the presence of two essential compounds called charatin and momordicin which play a key role in lowering blood sugar levels. 2. Facilitates Carbohydrate Digestion Bitter gourd inhibits the enzymes that are involved in breaking down the disaccharides to two monosaccharides, thereby reducing the amount of glucose released into the blood. Bitter gourd is effective in the treatment of both Type I and Type II diabetes as it influences the transport channels for glucose. This is particularly beneficial in preventing the spikes in blood sugar levels after meals. Reverses Insulin Resistance Bitter gourd has been found to be effective in the treatment of Type II diabetes. As stated earlier, it is caused due to the failure of the skeletal muscles, fat tissues, and liver to respond adequately to insulin. This is called insulin resistance which increases the risk of developing type II diabetes. Research has shown that bitter gourd contains compounds called oleanolic acid glycosides which can improve glucose tolerance in Type II diabetics, by preventing or reversing insulin resistance. 5. Antioxidant Properties Thus, high sugar concentration in the blood increases the risk of both Type I and Type II diabetes which further increases the risk of oxidation and inflammation in the whole body, leading to blindness, diabetic feet, stroke, heart attack or kidney disease. Bitter gourd can prevent all these ailments not only by lowering blood sugar levels but also through its antioxidant properties. [27] The bitter gourd is specifically used as a folk medicine for diabetes. Several

researches proved that it contains a hypoglycaemic or insulin-like principle, designated as 'plant-insulin', which has been found highly beneficial in lowering the blood and urine sugar levels. [28] Preliminary Dietary Supplementation Results of this preliminary study demonstrate, for the first time, the beneficial effects of WBG in Taiwanese adult subjects with MetS. A daily dose of 4.8 grams lyophilized WBG powders in capsules significantly decreased the incidence of MetS after three months of supplementation and the improved status remained after stopping the supplementation for one month, but not for two and three months. This indicates that the washout period should be at least one month if a crossover study is to be conducted. Our results show that it is worth to conduct further randomized-placebo controlled trials to confirm the benefits of WBG on metabolic disorders. [29]

CONCLUSION The concept of food as medicine is a central theme in dietetic and nutritional sciences. The goal from a diet perspective is to control your sugar in your bloodstream in such a way that the insulin in your bloodstream can manage it efficiently. M. charantia has been used as dietary supplements and ethnomedicine throughout centuries for relieving symptoms and conditions related to what we know in modern days as diabetes. In relation to diabetes, only charantin, insulin-like peptide and alkaloid-like extracts possess hypoglycemic properties similar to the plant itself or its crude extracts. These different compounds seem to exert their beneficial effects via several mechanisms

to control and treat diabetes mellitus. M.Charantia is very useful in diabetes. whole plant, its seeds and its fruit all are having antidiabetic property. Diabetes treatment is very good in allpath but very effective and good result is found in Ayurveda. M. Charantia have anti-diabetic property and it is very well understand by its bitter property and its chemical composition.

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