INTERNATIONAL
AYURVEDIC
MEDICAL JOURNAL

IAMJ

Research Article ISSN: 2320 5091 Impact Factor: 5.344

CLINICAL APPRAISAL OF BITTER GOURD IN THE MANAGEMENT OF DIABETES MELLITUS

L. D. Barik[1], S.K. Debnath[2], D. S. Sahu[3], J. Hazra[4]

[1,2,3]Research Officer Ayurveda, [4]Director;
Central Ayurveda Research Institute for Drug Development, 4 C N Block, Sector V, Bidhan Nagar, Kolkata-91, India

Email: ldbarik1963@gmail.com

ABSTRACT

Since antiquity, two third of the population of the world suffered with Metabolic disorders like Diabetes Mellitus treated with traditional medicine (herbal preparations). Research all over the world is going on to prove the efficacy of Herbal medicines & establish their effectiveness based on scientific evidences.*Karela*(*Momordica charantia*) is very popular drug being used for several ailments like antidiabetic, anthelmintic, eczema, antimalarial, gout, jaundice, laxative etc. There are few reports available on clinical use of *karela*fruits in diabetes mellitus and its complications. Anti-diabetic activity of the karela plant is being documented by various pre-clinical studies through many postulated mechanisms. However, clinical trial data with human subjects are very few and flawed by inappropriate study design. Material and method:30 Patients of Diabetes patients are being selected and advice them to take 20 ml of fresh *karela* juice twice daily for a period of 1 month and also advised to do Brisk walking for 30 minute. Observation and result: Fasting Blood Sugar ,Post Prandial Blood sugar and glycosylated Hemoglobin Type A1 C of the patients of diabetes Mellitus are remarkably reduced.

Keywords: *Karela, Momordica charantia*, Hypoglycaemic activity, Diabetes mellitus

INTRODUCTION

Momordicacharantia Linn. (*Karela*) commonly known as Bitter gourd is of the family Cucurbitaceae. The Latin name Momordica means "to bite" (referring to the jagged edges of the leaf, which appear as if they have been bitten). All parts of the plant, including the fruit taste very bitter as it contains a bitter compound called momordicin that is believed to have a stomachic effect. In Ayurveda, various parts of Momordicacharantia (*Karela*) are recommended for many diseases likecholera, bronchitis, anemia, blood diseases, ulcer, diarrhea, dysentery, sexual tonic and as a cure for gonorrhea. It is a potent hypoglycemic agent due to alkaloids and insulin like peptides and a mixture of steroidal sapogenins known as charantin. In the past decade, therefore, research has been focused on scientific evaluation of traditional drugs of plant origin. Momordicacharantia (MC) is one such plant that has been frequently used as medicine (Giron et al., 1991; Lans and Brown, 1998).

The different parts of the *Karela* contain following various biological activities:

Root - Acrid, astringent, bitter.

Leaf - Antipyretic, bitter, emetic, purgative.

Fruits - Acrid, anthelmintic, anti-diabetic, anti-inflammatory, appetizer, bitter, digestive, purgative, stimulant & stomachic.

Ayurvedic Properties: Momordicacharantia Linn. (*Karela*), a vegetable/medicinal plant is used in the Ayurvedic system of medicine for treating various diseases including diabetes mellitus, measles, fever, hepatitis, itching etc.


Figure 1


Figure.2


Figure 3


Figure 4

According to Ayurveda it contains:

1. *Gunna* (properties): *laghu* (light), *ruksh* (dry); 2. *Rasa* (taste): *katu* (bitter) and *tikta* (pungent); 3. *Virya* (potency): *Ushna* (hot)

Synonyms: *Karavella* (Sanskrit), Bitter gourd (English), *Karela* (Hindi), *Uchchhe* (Bengal), *Karela* (Guj) *Karla* (Maharasthra), *Kakara(*Telgu), *Pavakka* (Tamil), *Paval*, *Kaipavalli* (Mal.), *Hagala-kayi* (Kannada), *Gurkenahnlicher Balsamapfel* (German), Arab.- *Quisaul-barri* (Arab).

Part used: Fruits, seeds and leaves

Family: Cucurbitaceae.

Biochemical constituents: The main constituents of bitter melon (*Karela*) are triterpene, protein, steroid, alkaloid, inorganic, lipid, and phenolic compounds, alkaloids, momordicin and charantin, charine, cryptoxanthin, cucurbitins, cucurbitacins, cucurbitanes, cycloartenols, diosgenin, elaeostearic acids, erythrodiol, galacturonic acids, gentisic acid, goyaglycosides, goyasaponins, guanylatecyclase inhibitors, gypsogenin, hydroxytryptamines, karounidiols, lanosterol, lauric acid, linoleic acid, linolenic acid &many more.

Pharmacological activity: Experimentally Momordicacharantia (MC) is most widely studied with regard to its anti-diabetic effect and all parts of the plant (fruit pulp, seed, leaves and whole plant) have shown hypoglycemic activity in normal animals (Bailey et al., 1985; Day et al., 1990; Shibib et al.,1993; Ali et al., 1993; Cakici et al., 1994; Sarkar et al.,1996; Jayasooriya et al., 2000); and antihyperglycemic activity in alloxan (Akhtar, 1982; Karunanayake et al., 1984;Singh et al., 1989; Pari et al., 2001; Rathi et al., 2002a; Kar et al., 2003).However, in a recently conducted study, Kar et al. (2003)achieved nearly euglycemic state with ethanolic extracts of Momordicacharantia fruit (250 mg/kg) within 2 weeks of treatment. Chronic treatment with aqueous fruit extract (200 mg/kg, orally) in alloxan diabetic rats caused a significant fall in plasma glucose levels of 64.33, 66.96, 69.7 and 70.53% at 1, 2, 3 and4 months, respectively, and mean reduction of 15.37, 18.68and 22.86% in STZ mice at 40, 50 and 60 days, respectively(Rathi et al., 2002a). In another study, it was shown to act like insulin or promote insulin release Welihinda et al., 1986; Higashino et al., 1992). Matsuda et al. (1998) attributed the hypoglycemic activity of MC to inhibition of glucose transport at the brush border of the small intestine. In a clinical trial, a water-soluble extract of the fruits of Momordicacharantia significantly reduced blood glucose concentrations in the nine NIDDM .

Material and Methods: Total 30 patients of type 2 diabetes mellitus were enlisted those are attended in the OPD of National Research Institute of Ayurvedic Drug Development, Kolkata-91.

Dose: Each and everyday morning&evening patients were advised to take fresh juice of 20 ml fresh juice of *karela* (Momordicacharantia).

Exercise-After that Patient was advised to do brisk walking for 30 minutes.

Result & Observation: In the present study maximum registered patients were belonging to 30-60years age group, average random blood sugar level was more than 200 mg/dl ,positive family history of Diabetes mellitus (60%) and sufferings with diabetes since 2-5year and the history of hypertension since 2-5 years (40%). More than 60% patients had *Vishamagni* (52%) *KruraKoshtha* (50%), *Va-*

taKaphaPrakriti (55%), *Madhyama AturaBala* (56%), and belonging to overweight criteria (56%). In maximum patients Vata predominant (90%) and *MedovahaSrotoDushti* (50%) *Lakshana* were observed.

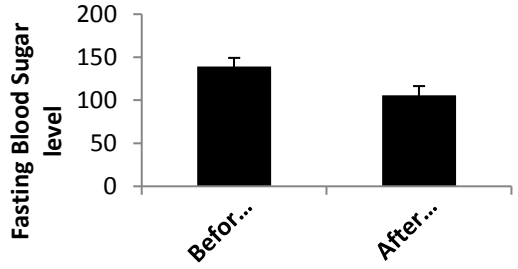
Table 1: Effect of therapies on presenting complaints of diabetes

Presenting Complain	Before Treatment	After Treatment	% of Relief
PrabhutaMutrata (frequency of micturition)	18	2	88.8
AvilMutrata (Turbidity of Urine)	19	3	84.2
Kshudadhikya (polyphasia)	21	4	80.95
Trishnadhikya (polydipsia)	23	4	82.6
Karapadadaha (Burning sensation)	14	3	78.5
Atisweda (Excessive perspiration)	12	3	75
Daurbalya (Debility/weakness)	13	2	84.6

The effect of Karela juice was significant in almost all patients of Diabetes Mellitus. Highly significant ($P < 0.001$) improvement is found in *Prabhuta Mootrata* (frequency of urine), *Avila Mootrata* (turbidity of urine) and *Daurbalya* (weakness). Significant improvement ($P < 0.01$) was found in *Trishnadhikya* (polydipsia), *KarapadaDaha* (burning sensation in palms and soles) and *Atisweda* (excessive perspiration).

Effect of *Karela* juice on Fasting Blood sugar: After a period of 1-month intake of *Karela* juice the fasting blood sugar is remarkably reduced to normal.

Table 1:



Effect of *Karela Swaras* in Post prandial Blood Sugar: The Post prandial blood sugar and glycosylated Hemoglobin Type A1 C is remarkably reduced in most all the diabetic patients.

Table 2

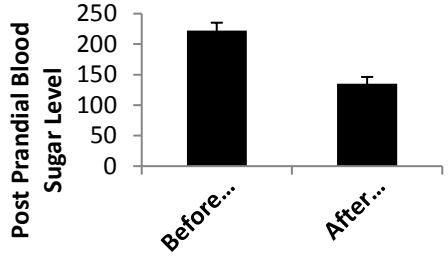
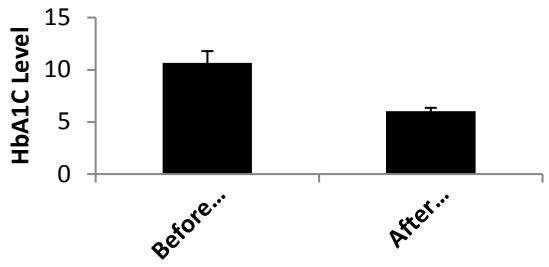


Table 3



DISCUSSION

Bitter melon (*Momordica charantia* L.) is widely used as a traditional medicine for treatment of diabetic patients in Asia. In vitro and animal studies suggested its hypoglycemic activity, but limited human studies are available to support its use.

Over the year's scientists have verified many of the traditional uses of this bitter plant (Momordica charantia) concentrated fruit or seed extracts that are marketed today. *Momordica charantia* preparations are becoming more widely available in the U.S as well as rest of the world for treatment of diabetes, psoriasis and viral diseases, including flu. Role of *Momordicacharantia* in diabetes is of paramount importance as this plant serves various purposes in these patients—lowers blood sugar, delays complications (nephropathy, neuropathy, gastroparesis and cataract, athereosclerosis) and is anti-infective are known to be more susceptible to infections. This proves that this treatment is safe. Karela juice is effective to reduce the fasting blood sugar as well as post pranndial blood sugar. Glycosylated Hemoglobin Type A1 C is remarkably reduced also after taking karela juice.

CONCLUSION

Karela (Momordicacharantia) is proved to have antihyperglycemic property Bitter melon had a modest hypoglycemic effect and significantly reduced fasting blood sugar,Post prandial sugar.Bitter melon (Momordicacharantia) is an alternative therapy that has primarily been used for lowering blood glucose levels in patients with diabetes mellitus. Components of bitter melon extract appear to have structural similarities to animal insulin. Antiviral and antineoplastic activities have also been reported in vitro. Four clinical trials found bitter melon juice, fruit, and dried powder to have a moderate hypoglycemic effect. Bitter melon may have additive effects when taken with other glucose-lowering agents. Bitter melon may have hypoglycemic effects, but data are not enough to recommend its use in the absence of careful supervision and monitoring.

REFERENCES

1. *SushrutaSamhita, ChikitsaSthana, Anuvasanottara Basti* 37/77. 9th ed. Jadavaji Trikamji Acharya., editor. Varanasi: Chaukhamba Orientalia; 2007. p. 536.
2. *Charaka, Dridhabala, CharakaSamhita, Siddhi Sthana, Panchakarmiya Siddhi*, 2/24-28. Reprint ed. Jadavaji Trikamji Acharya., editor. Varanasi: Chaukhamba Krishnadas Academy; 2006. p. 690.
3. Andersen AR, Christiansen JS, Andersen JK, Kreiner S, Deckert T. Diabetic nephropathy in type 1 (insulin-dependent) diabetes: An epidemiological study. Diabetologia. 1983; 25:496–501.
4. Genuth SM. The case for blood glucose control. Adv Intern Med. 1995;40:573–623.
5. *Charaka, Dridhabala, Charaka Samhita, ChikitsaSthana, PramehaChikitsa*, 6/4. Reprint ed. Jadavaji Trikamji Acharya., editor. Varanasi: Chaukhamba Krishnadas Academy; 2006. p. 445.
6. *Charaka, Dridhabala, CharakaSamhita, Sutra Sthana, ShadvirechanaShatashritiya*, 4/15. Reprint ed. Jadavaji Trikamji Acharya., editor. Vol. 33. Varanasi: Chaukhamba Krishnadas Academy; 2006.
7. Anonymus. I. New Delhi: Department of AYUSH, Ministry of Health and Family Welfare, Govt. of India; 2001. The Ayurvedic Pharmacopoeia of India; p. 52. Part I.
8. *Sushruta Samhita, Sutra Sthana, Annapanvidhi*, 46/255. 9th ed. Jadavaji Trikamji Acharya., editor. Varanasi: Chaukhamba Orientalia; 2007. p. 232.
9. Anonymus. I. New Delhi: Department of AYUSH, Ministry of Health and Family Welfare, Govt. of India;

2001. The Ayurvedic Pharmacopoeia of India; p. 128. Part I.
10. *Sharangadhara Samhita, Madhyama Khanda, Sneha-Kalpana,* 9/1-2, translator. 2nd ed. Varanasi: Chaukhamba Sanskrit Series Office; 2007. p. 199.
11. Pawar A. Jamnagar: I.P.G.T. and R.A., Dept. of Kaya Chikitsa, Thesis Submitted to Gujarat Ayurveda University; 2003. A comparative study of the role of Basti therapy and Pramehaghna drugs in the management of Madhumeha.
12. Ibidem. *CharakaSamhita, NidanaSthana, Prameha-Nidana,* 4/8. :213.

Source of Support: Nil
Conflict of Interest: None Declared

How to cite this URL: L.D. Barik et al: Clinical Appraisal Of Bitter Gourd In The Management Of Diabetes Mellitus. International Ayurvedic Medical Journal {online} 2020 {cited February, 2020} Available from: http://www.iamj.in/posts/images/upload/2714_2718.pdf