



HYPOGLYCEMIC EFFECT OF *Triticum Sativum Lam.* –GODHUMA PATRA SWARASA W.S.R TO MADHUMEHA – A PILOT STUDY

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It is a clinical study conducted on patients of Madumeha nearest resembling condition with diabetes mellitus, a rich man's disease to evaluate the hypoglycemic effect of Godhuma Patra Swarasa (Wheat grass juice) which traditionally practised in rural areas of Karnataka. On the basis of this survey, present study was designed on newly diagnosed cases of type II diabetes mellitus with an aim and objectives To evaluate the hypoglycaemic effect of Godhuma Patra Swarasa, Materials and methods of the study were planned on 10 newly diagnosed cases of diabetes mellitus was administered with Godhuma Patra Swarasa, Result & Discussion of the study revealed that Godhuma Patra Swarasa showed good result in relieving the subjective criteria's viz. Kshudhadhikyata, Daurbalya and Pipasadhikyata than objective criteria's like FBS, PPBS.

Key words: Madhumeha, Godhuma Patra Swarasa, Hypoglycemia.

Interoduction

Diabetes mellitus has emerged as an important public health problem globally. It has become an endemic disease affecting people irrespective of their age, sex, socio-economic status. It is a metabolic disorder characterized by hyperglycemia with cardinal features of Polyuria, Polydipsia and Polyphagia. In India at present approximately about 32 million people are suffering from diabetes and the future affliction is projected to 80 million by the year 2030^{1,2,3}. In Ayurveda, Diabetes Mellitus is known to be a 'Rich man's disease' which can be understood by etiological factors of Prameha⁴ mentioned as enjoying the pleasures of life with reduced or no physical activity and sedentary life. Madhumeha is type of Vataja Prameha⁵ & it is the nearest resembling condition with Diabetes Mellitus. Few researches are done and analyzed the efficacy of various Dravya's mentioned in Ayurvedic classics in Madhumeha. Here an attempt is made to analyze the effect of Dravya "Godhuma Patra Svarasa (Wheat grass juice)" which is used by many traditional practitioners of Karnataka. As though there is no direct reference of use of Godhuma Patra Swarasa but Godhuma has been told as Pathya⁶ in Prameha by this, use of Godhuma Patra Swarasa (Wheat grass juice)⁷ can be traced out and to confirm its efficacy a pilot study was conducted.

CLINICAL STUDY

AIMS AND OBJECTIVES OF THE STUDY

1. To evaluate the hypoglycaemic effect of Godhuma Patra Swarasa in Prameha

MATERIALS AND METHODS

SELECTION OF PATIENTS

Patients attending the OPD and IPD of S.D.M. college of Ayurveda and Hospital, Hassan were selected irrespective of age, sex, religion, occupation, marital status etc.

INCLUSION CRITERIA

Mild to moderate cases of diabetes mellitus having fasting blood sugar within range of 121 mg/dl to 220 mg/dl and post prandial blood sugar within range of 181 mg/dl to 280 mg/dl were selected.

Patients above the age group of 25 years and below 70 years of age were selected

Patients of newly diagnosis for diabetes mellitus were selected for the study.

EXCLUSION CRITERIA

Severe form i.e. patients having fasting blood sugar above 221 mg/dl and post prandial blood sugar above 281 were excluded.

Patients with uncontrolled blood sugars were excluded.

Patients with other systemic disorders and complications of diabetes mellitus were excluded from the study.

Type I diabetes mellitus were excluded.

DIAGNOSTIC CRITERIA

Newly diagnosed cases of diabetes mellitus were selected for the study. Mild to moderate diabetic cases were selected based on the following standard reference chart for classification along with the clinical signs and symptoms mentioned in the classics.

FBS	70 to 120 mg/dl	normal
	121 to 170 mg/dl	mild
	171 to 220 mg/dl	moderate
	221 and above	severe
PPBS	120 to 180 mg/dl	normal
	181 to 230 mg/dl	mild
	231 to 280 mg/dl	moderate
	281 and above	severe

As per classification of S.N Khosle at al.Nagarjuna

RESEARCH DESIGN:

10 newly diagnosed cases of Madhumeha were selected

Swarasa matra is 1 Pala (50ml) as per the classics. In the present study the dosage of Godhuma Patra Swarasa is also decided principally based on the above.

10 Patients were administered Godhuma Patra Swarasa in the dosage of 1 Pala (50ml) twice a day before food.

Diet and exercise were strictly advised.

Duration of Treatment: Two months.

ASSESSMENT CRITERIA

Table no.1

Sl.No	Subjective Parameter	Assessment
1	Assessment of Kshuddhaadhikyata 8,9 (excessive hunger)	Grade 0- Normal timely manifestation /can control hunger

		Grade 1- Slightly increased/Can control hunger up to 1 hr
		Grade 2- Excessive hunger / cannot withstand
		Grade 3- Feels hungry even after consuming food
2	Assessment of Pippasadhikyata ^{8,9} (excessive thirst)	Grade 0 Normal thirst up to 1.5 liters per day
		Grade 1- Feels thirsty up to 2 liters per day
		Grade 2- Feels very thirsty 3 liters per day
		Grade 3- Always thirsty more than 3 liters per day
3	Assessment of Prabhuta mutrata ^{8,9} (Poly uria)	Grade 0 Frequency of Micturation at night 0-1
		Grade 1- Frequency of Micturation at night 2-3
		Grade 2- Frequency of Micturation at night 4-5
		Grade 3- Frequency of Micturation at night more than 5
4	Assessment of Daurbalya ^{8,9}	Grade 0 No weakness
		Grade 1- Feels tiredness after strenuous work
		Grade 2- Feels frequent tiredness even after mild work
		Grade 3- Always associated with tiredness

Drug Review:

Analyzing Report of Wheat grass juice

The analysis of 10% water extract of the wheat grass supplied indicated the presence of following amino acids,

Alanine	Lysine	Histidine
Arginine	Methionine	Tyrosine
Asparatic acid	Phenylalanine	Isoleucine
Cystine	Proline	Valine
Glutamic acid	Threonine	Leucine
Glycine	Tryptophan	

Table 2

Nutritional Analysis of the Herbal Grass Juice
Herbal grass juice contains following nutrients – (3.5 Gms serving.)

Nutrients	Amount	RDI
Calories	13	
Calories from fat	0	
Cholesterol	0	
Carbohydrates	1.6g	
Protein	860mg	
Dietary fiber	1g	4%
Chlorophyll	18.5mg	
Vitamins	Amount	RDI
Biotin	4mcg	
Choline	5mg	
Lutein	1mg	
Lycopene	29mcg	
Vit A	1668 IU	30%
Vit B1	11 mcg	
VitB2	260 mcg	17%
Vit B3	252 mcg	
Vit B5	36 mcg	
Vit B6	39 mcg	
Vit B8	21 mcg	10%
Vit 12	.05 mcg	
Vit C	7.5 mg	13%
Vit E	320 mcg	
Vit K	35 mcg	20%
Minerals		
Calcium	15mg	
Cobalt	1.7mg	
Iodine	8 mcg	
Iron	870 mcg	4%
Magnesium	3.9 mg	
Manganese	240 mcg	7%
Phosphorus	14 mg	
Potassium	137 mg	
Selenium	3.5 mcg	6%
Sodium	1 mg	

Sulfur	10.5 mg	
Zinc	62 mcg	

RESULTS

Effect of Godhuma Patra Swarasa on the Patients of Madhumeha (NIDDM): As mentioned above 10 patients were treated with Godhuma Patra Swarasa administered in the dose of 50 ml twice a day before food for two months.

Table no. 3 - Effect of Godhuma Patra Swarasa in 1st month

<i>Signs & Symptoms</i>	<i>Mean BT</i>	<i>Mean AT</i>	MD	<i>% of Change</i>	<i>SD (±)</i>	<i>SE (±)</i>	<i>t*</i>	<i>p</i>
Prabhuta mutrata	3.8	2.5	1.3	34.21	0.67	0.21	6.19	<0.001
Pipasadhikyata	3.2	1.9	1.3	40.7	0.82	0.26	5	<0.001
Kshudhadhikyata	1.8	1.2	0.6	33.4	0.68	0.22	5.45	<0.001
Karapada Daha	3.4	2.3	1.1	32.4	0.73	0.23	4.7	<0.001
Daurbalya	1.6	0.7	0.9	56.25	0.98	0.32	2.81	<0.02
F.B.S	162.7	149.6	13.1	7.06	8.25	2.66	4.32	<0.001
P.P.B.S	212.5	190.5	22.1	10.45	8.60	2.77	7.9	<0.001

Table no. 4 -Effect of Godhuma Patra Swarasa in 2nd month

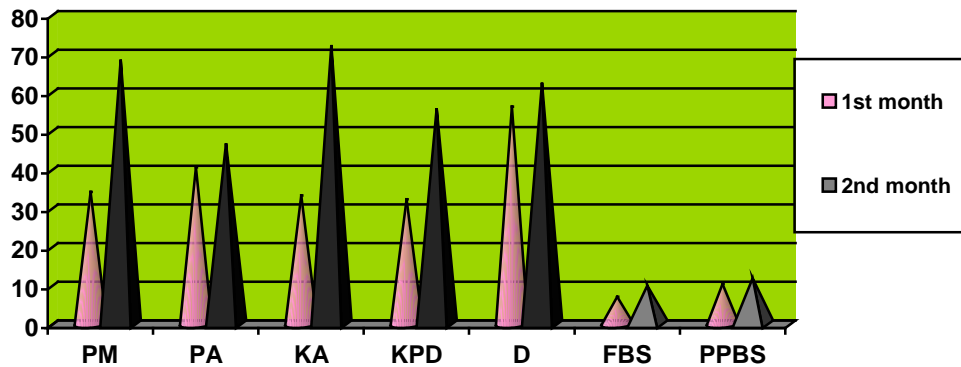
<i>Signs & Symptoms</i>	<i>Mean BT</i>	<i>Mean AT</i>	MD	<i>% of Change</i>	<i>SD (±)</i>	<i>SE (±)</i>	<i>t*</i>	<i>p</i>
Prabhuta mutrata	3.8	1.2	2.6	68.48	0.51	0.16	16.25	<0.001
Pipasadhikyata	3.2	1.7	1.5	46.8	0.87	0.28	7.5	<0.001
Kshudhadhikyata	1.8	0.7	1.3	72.3	0.70	0.22	5.90	<0.001
Karapada Daha	3.4	1.5	1.9	55.9	1.05	0.34	7.05	<0.001
Daurbalya	1.6	0.6	1.0	62.5	1.05	0.34	2.99	<0.01
F.B.S	162.7	146.6	16.2	9.95	8.39	2.70	6	<0.001
P.P.B.S	212.6	187.3	25.3	11.90	11.73	3.78	6.69	<0.001

Table no. 5 - Effect of the over all treatment

Parameters	Godhuma Patra Swarasa	
	1st month	2nd month
Prabhuta mutrata	34.3 %	68.5 %
Pipasadhikyata	40.7 %	46.7 %
Kshudhadhikyata	33.4 %	72.3 %
Karapada Daha	32.4 %	55.9 %
Dourbhalya	56.3 %	62.5 %
FBS	7.1 %	9.9 %

PPBS	10.4 %	11.9 %
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Graph no. 1 - Percentage of improvement in Godhuma Patra Swarasa



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DISCUSSION

Effect of therapy:

On Prabhuta mutrata -

After one month of the treatment Godhuma Patra Swarasa showed **34.2%** improvement in Polyuria and **68.5 % improvement after second month.**

On Pipasadhikyata –

After one month of the treatment Godhuma Patra Swarasa showed **40 .3 %** improvements in Polydypsia (Pippasa adhikata) and **46.8 % after second month.**

On Kshudhadhikyata –

After one month of the treatment Godhuma Patra Swarasa showed **33.4 %** improvements in Kshudhadhikyata (increased appetite) and

72.3 % after second month.

Phenylalanine – in Godhuma Patra Swarasa is amino acids, it is essential in human Nutrition. It is used in elevating the mood as it is closely involved with the nervous system and it acts as appetite suppressant.

Glutamic acid – in Godhuma Patra Swarasa is amino acids. Rightly considered to be nature’s brain food by improving mental capacity, helps give a lift from fatigue and also it suppresses the craving for sugar.

The protein contents in the Godhuma Patra Swarasa helps the patients to overcome the emaciation caused by utilization of fats and proteins for energy needs of the body thereby relieving the symptom of **Kshudhadhikyata**

On Karapada Daha-

After one month of the treatment Godhuma Patra Swarasa showed **32.4 %** improvements in **Karapada Daha** and **55.9 % after second month.**

(Vascular and neural diseases are closely related and intertwined. Blood vessels depend on normal nerve function, and nerves depend on adequate blood flow. The first pathological change in the microvasculature is vasoconstriction. As the disease progresses, neuronal dysfunction correlates closely with the development of vascular abnormalities, such as capillary basement membrane thickening and endothelial hyperplasia,

which contribute to diminished oxygen tension and hypoxia. Neuronal ischemia is a well-established characteristic of diabetic neuropathy.)

Tryptopan – in Godhuma Patra Swarasa is a amino acid.it is essential for human nutrition also helps in reducing the risk of artery.

Arginine – in Godhuma Patra Swarasa is a amino acid.it is a conditionally essential amino acid. Supports the cardio vascular system and prevents the cells and arteries dying from the hypoxia.

Methylcobalamin, a special form of Vitamin B12, is being studied now for treatment of neuropathy

Niacin (Vit B3) – in Godhuma Patra Swarasa dialtes the blood vessels and increases the flow of blood to the peripheral capillary system.

Vit C, Vit E, Superoxide Dismutase (SOD) & Selenium – in Godhuma Patra Swarasa is an highly potency anti-oxidant enzyme which prevents the impact of free radicals on the blood vessels which causes diabetic neuropathy

On Daurbalya –

After one month of the treatment Godhuma Patra Swarasa showed **56.3 %** improvements in **Daurbalya** and **62.5 %** after second month.

Alanine – in Godhuma Patra Swarasa is a amino acid, an important source of energy for muscle tissue, brain and the CNS system. Also strengthens the immune system by producing the anti bodies, helps in the metabolism of sugar and organic acids.

Aspartic acid – in Godhuma Patra Swarasa is amino acid. Helps in expulsion of harmful ammonia from the body. When ammonia acts on the circulatory system it is highly toxic and this can in turn shows harmful to CNS system, and also increases resistance to fatigue and increase endurance.

On F.B.S

After one month of the treatment Godhuma Patra Swarasa showed **7.1 %** improvements in F.B.S while **9.9 %** improvement after second month.

Biotin – in Godhuma Patra Swarasa ,lowers the fasting blood glucose level as a co-factor of enzymes required for fatty acid synthesis, Biotin may increase the utilization of glucose to synthesize fats, biotin has been found to stimulate glucokinase, an enzyme in the liver, resulting in increased synthesis of glycogen, the storage form of glucose, and also biotin has also been found to stimulate the secretion of insulin in the pancreas these thing helps in the lowering the blood glucose.

On P.P.B.S

After one month of the treatment Godhuma Patra Swarasa showed **10.4 %** and **11.9 %** improvement after second month.The rich fiber content of wheat grass (Godhuma) slows down the carbohydrate digestion and absorption and so improves glycemic control. Wheat grass (Godhuma) has a low glycemic index of 54, which helps in controlling the raise in the post prandial blood glucose levels. The low Glycemic index of the Godhuma Patra Swarasa (Godhuma) i.e. 54 delays the digestion process and slows down the absorption of carbohydrate from intestine thereby helps to maintain the sudden rise in blood glucose levels soon after food intake. As the sudden increase in post prandial blood sugar is controlled the post prandial urine sugar also is thereby controlled.)

Significant Effects of Godhuma Patra Swarasa: Godhuma Patra Swarasa provided significant relief in Prabhuta mutrata (68.5%), Pipasadhikyata (46.7%), Kshudhadhikyata (72.3%), Karapada Daha (72.3%) and Daurbalya (62.5%).It significantly reduced the fasting blood sugar by 9.9 % and postprondial blood sugar by 11.9 %.

SUMMARY AND CONCLUSION

In this study Godhuma Patra Swarasa showed good result in relieving the subjective criteria's viz. Kshudhadhikyata, Daurbalya and Pipasadhikyata compared to objective criteria's like FBS and PPBS. By

this we can claim that Godhuma Patra Swarasa is best indicated in reliving the subjective symptoms rather than objective symptoms.

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