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A Clinical Trial of *Jambu* (*Eugenia jambolana*) in Non-insulin Dependant Diabetes Mellitus

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Considering the chronic nature of the disease and difficulties in its management due to side effects of the modern drugs, it is necessary to look for drugs, from indigenous systems of medicine. Accordingly trial of jamun beej (E. jambolana) has been taken up on 30 patients of non-insulin dependant diabetes. The drug produces good symptomatic relief alongwith regulation of blood sugar.

Introduction

The need of the indigenous drugs in the management of Diabetes mellitus has been felt because of the complexity of the disease and non-availability of satisfactory therapeutic measures in relieving the patients of this disease. The diabetic complications and side effects of modern therapeutic agents makes such a search of indigenous antidiabetic measures all the more important. The large scale conventional use of *Jamun beej* (*Eugenia jambolana*), its repeated reference in the classical Ayurvedic Literature and the results of the experimental studies led the authors to undertake the present clinical trial. This study was conducted in Sir. Sunderlal Hospital of Banaras Hindu University during the period 1983-84.

Methodology

Thirty case of uncomplicated Maturity onset (Non-insulin dependant) diabetes were randomly selected. All the subjects were subjected to Oral G.T.T. along with other routine investigations to rule out diabetic complications as also to have the basal status. The diagnosis was made following the criteria laid down by WHO Expert Committee on Diabetes (1980) according to which the following con-

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centrations of glucose in venous whole blood should be accepted as normal or diabetic respectively using 75 gms of glucose load.

Glucose Concentration in mg%

	Normal	Diabetic
Fasting	< 100 mg%	> 120 mg%
2 hours after glucose	< 120 mg%	> 180 mg%

Drugs and Diet

Seeds of *Eugenia jambolana* were procured from the Varanasi market and crushed to fine powder. This was used in the dose of 12 gms daily in three divided doses for 3 months. No new dietary restrictions were advised in known diabetics while no diet control was advised in freshly diagnosed cases.

Follow-up was done at monthly intervals for 3 months.

Parameters of assessment :

Monthly assessment was done under two major heads :

(i) Subjective improvement.

(ii) Objective improvement.

Subjective assessment

Clinical symptoms were graded into 4-grades (0 to 3) of severity and change in the gradations of each symptom were studied in every follow up.

The clinical gradation of symptoms was done on the following pattern of gradation.

Polydipsia—Grade 0: Normal feeling of thirst and daily water intake is 1.5 to 3 litres (With seasonal variations).

Grade I : Feeling of thirst is increased but patient can control it to normal frequencies of intake. Total intake is more than normal.

Grade II : Frequency of thirst increased (once in 2 hours) with excessive volume intake.

Grade III : Frequency of thirst highly increased (> once in 2 hrs.) and intake is excessive.

Similarly other symptoms such as polyurea, polyphagia, weight loss, weakness, cramps on walking, joint pains and diminished libido were graded and studied at every follow up.

Objective assessment

Oral Glucose Tolerance Test was repeated every month. The cases were classified as having good, fair, and poor response to the treatment following the method of Joslin Clinic. The degree of control with oral hypoglycaemic drugs was defined by the Joslin Clinic (U.S.A.).

For the purpose of classification as degree of control, 70% of the readings must conform with the standard.

Modern drug-group

Six patients of non-insulin dependent diabetes were treated only with chlorpropamide (Diabenese) for one month in dose of 250 mgm in single daily dose. This group was made in order to compare the hypoglycaemic effect of the trial drug with this known oral hypoglycaemic agent.

Observations

All the 30 cases registered for the trial of *Eugenia jambolana* attended the tirst follow up, but oral GTT could be done only in 28 cases. 24 cases come for 2 month in follow up and only 9 cases were available for 3 months followup.

Subjective assessment

There was remarkable relief in the symptoms in terms of a favourable shift of grades (from 3 to 0). The symptomatic relief was found to be progressively increasing in the successive months. There was also highly significant reduction in the mean grade scores of different symptoms as is evident from table I. Only diminished libido was not found to improve in first two months, but the improvement was significant after 3 months of treatment. (Table—I).

Objective improvement

This was assessed by the reduction in blood sugar at every monthly follow up. The reduction in blood sugar levels was found to be highly significant after one month and two months of treatment. The reduction was less after 3 months of treatment as compared to the previous follow-ups. (Table II, Fig. 1). The response to treatment with *E. jambolana* by Joslin Clinc criteria was found as mentioned in Table III.

The results recorded after one month of chlorpropamide treatment are given in table IV. Although the number of cases for modern drug are too less in comparison to *Eugenia jambolana* group, still a gross inference can be drawn that seeds powder of *Eugenia jambolana* have a comparable hypoglycaemic effect to chlorpropamide (Fig. 2). The statistical insignificance got by modern drug after one month appears to be because of highly inadequate number of subjects in this group.

Discussion

The object of the present study was to launch a long term clinical trial of *Eugenia jambolana* (*Jambu*) to assess its anti-diabetic effect. The drug was tried in a selected series of patients following a self control system. The results indicate marked symptomatic relief, which was found to be progressively increasing with duration of treatment. Diminished libido

Table—I

Showing symptomatic relief in cases of *Diabetes mellitus* after treatment with *E. jambolana*

Symptoms	Initial Mean ± SD	After 1 month of treatment Mean ± S.D.	After 2 months of treatment Mean ± S.D.	After 3 months of treatment Mean ± S.D.
Polyurea	1.60±1.04	0.33±0.55 t= 2.61 p < 0.05	0.21±0.41 5=5.79 P<0.001	0 ±0 t=6.67 p<0.001
Polydipsia	1.67±1.12	0.43±0.63 t= 5.29 p< 0.001	0.22±0.42 5=6.54 p<0.001	0 ±0 t=8.19 p<0.001
Polyphagia	1.07±1.08	0.33±0.061 t= 3.27 p< 0.01	0.17±0.38 t=4.28 p<0.001	0 ±0 t=5.43 p<0.001
Weight loss	1.45±1.09	0.66±0.86 t= 3.17 p< 0.01	0.29±0.55 t=5.07 p<0.001	0 ±0 t=7.09 p<0.001
Weakness	1.63±0.61	0.77±0.57 t= 5.65 p< 0.001	0.29±0.46 t=9.20 p<0.001	0.33±0.50 t=6.49 p<0 001
Cramps on walking	1.57±1.07	0.60±0.62 t= 4.30 p< 0.001	0.17±0 38 t=6.67 p<0.001	0 ±0 t=8.04 p<0.001
Joint pain	1.0±0.91	0.47±0.68 t= 2.56 p< 0.05	0.29±0.62 t=3.40 p<0.01	0.56±0.88 t=1.37 p>0.05 (N.S.)
Diminished libido	1.17±1.05	1.04±1.12 t= <1 p> 0.05 (N.S.)	0.83±1.04 t=1.07 p>0.05 (N.S.)	0.13±0.35 t=3.67 p<0.01 Significant

Table—II

Showing the mean G.T.T. before and after treatment with *E. jambolana*

Sample	Initial blood sugar in mgm% Mean ± S.E.	FOLLOW UP					
		After 1 month (28 cases)		After 2 months (24 cases)		After 3 months (9 cases)	
		Blood sugar in mg%	Reduction in blood sugar	Blood sugar in mg%	Reduction in blood sugar	Blood sugar in mg%	Reduction in blood sugar
Fasting	163.00 ±14.83	129.61 ±12.03	38.43 ±42.39 p<0.001	99.64 ±9.49	51.86 ±42.08 p<0.001	130.11 ±18.87	32.44 ±45.62 p>0.1 N.S.
After 1 hour of Glucose	279.001 ±18.64	222.68 ±16.06	59.18 ±58.87 p<0.001	183.55 ±9.31	81.50 ±62.69 p<0.001	220.33 ±22.71	65.22 ±66.81 p<0.01 Sig.
After 2 hours of Glucose	304.67 ±20.56	249.00 ±18.83	62.43 ±66.87 p<0.001	192.62 ±13.69	95.95 ±65.46 p<0.001	226.00 ±20.16	92.00 ±69.74 p<0.01

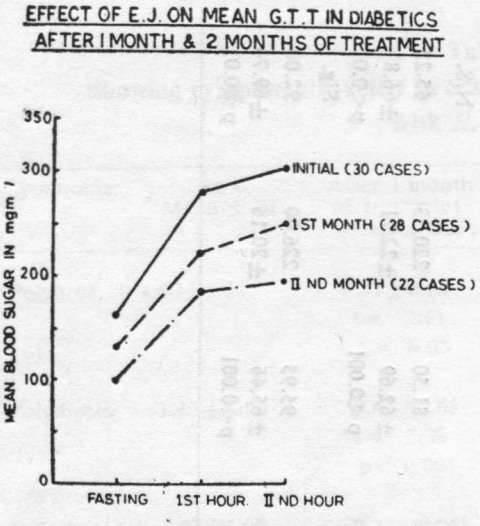

Fig. 1

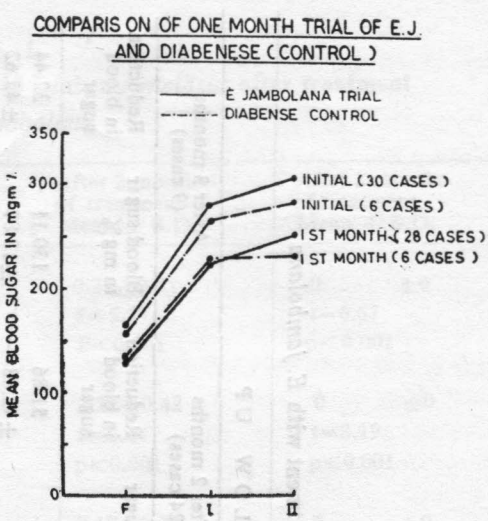

Fig. 2

Table—III

Showing the classification of response of *E. jambolana* in patients of NIDDM as per Joslin's Clinic Criteria

Sl. No.	Duration of treatment	Response to Treatment					
		Good		Fair		Poor	
		No. of cases	Percentage	No. of cases	Percentage	No. of cases	Percentage
1.	1 month (28 cases)	06	21.43	11	39.28	11	39.28
2.	2 months (24 cases)	05	20.83	13	54.16	06	25.00
3.	3 months (9 cases)	01	11.11	02	22.22	06	66.66

Table—IV

Showing the comparison between mean G.T.T. before and after one month's treatment with *E. jambolana* and Diabenese

Sample	E. jambolana group			Diabenese group			
	Blood sugar in mg% (mean ± S.D.)		Blood sugar reduction after 1 month (mean ± S.D.)	Blood sugar in mg% (mean ± S.D.)		Blood sugar reduction after 1 months (Mean ± S.D.) Values are using paired + COST	
	Initial (30 cases)	After 1 month (28 cases)		Initial (6 cases)	After 1 month (6 cases)		
Fasting	163.00 ± 81.29	129.61 ± 63.58	38.43 ± 42.39 $p < 0.001$	155.67 ± 73.61	130.00 ± 66.47	25.67 ± 73.87 $p > 0.1$	N.S.*
One hour after Gl. load	279.00 ± 102.15	222.68 ± 84.98	59.18 ± 58.87 $p < 0.001$	262.67 ± 83.72	226.50 ± 70.10	37.17 ± 58.78 $p > 0.1$	N.S.*
Two hours after Gl. load	304.67 ± 113.14	249.00 ± 99.62	62.43 ± 66.87 $p < 0.001$	281.17 ± 101.11	230.67 ± 117.29	50.50 ± 44.89 $p < 0.05$	t=2.515 Sig.

* Statistical non significance could be because of less number of subjects in this group.

was the only symptom which was not found to improve significantly with drug under trial.

There was a simultaneous correction of blood sugar levels progressively improving in first and second months. The blood sugar lowering effect was comparatively less in the third month. It is possible that we had more resistant cases left with us for 3rd month follow up.

Chlorpropamide (Diabenese) treatment was instituted in six cases of NIDDM and its blood sugar lowering property was compared with that of *Eugenia jambolana*. It was found that *Eugenia jambolana* has definite, moderate hypoglycaemic effect comparable to effect of chlorpropamide.

The mode of action of trial drug was not a part of the present study, still it can be hypothesised that it acts either by betacell stimulation or by increasing the peripheral utilization of glucose or by both ways.

Summary

It is observed that the drug *Jambu* (*Eugenia jambolana*) produces good symptomatic relief and a simultaneous reduction in blood sugar levels. From the chlorpropamide study, it can be inferred that the trial drug has a moderate hypoglycaemic effect comparable with the effect of chlorpropamide. Seeds powder of *Jambu* did not show any side effects and was well tolerated. It being freely available throughout the country and being extremely cheap with no side effects, should be popularised for use by all patients of NIDDM as also the prediabetics.

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हिन्दी सारांश

मधुमेह के इन्सुलीनरहित चिकित्स्यरुग्णों पर जम्बू बीज का निदान चिकित्सात्मक अध्ययन

कुलदीप राज कोहली एवं राम हर्ष सिंह

व्याधि की क्लिष्ट सम्प्राति एवं संतोषजनक औषधियों के अभाव में मधुमेह की चिकित्सा में देशी औषधियों की उपयोगिता की आवश्यकता है। मधुमेह के उपद्रवों तथा आधुनिक चिकित्सा के दुष्प्रभावों के कारण देशी मधुमेह हर औषधियों का महत्व और भी बढ़ जाता हैं। जामुन के बीज के मधुमेह की चिकित्सा में उल्लिखित संदर्भों तथा जान्तव परीक्षणों में इसके शर्कराशामक प्रभाव के आधार पर इसका निदान चिकित्सात्मक परीक्षण किया गया। मधुमेह के 30 रूग्णों पर परीक्षण किया गया। औषध व्याधि के मुख्य लक्षणों के शमन के साथ ही साथ रक्तगत शर्करा में भी कमी लाती हैं।