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Effect of Amla Powder and Turmeric Powder Consumption on Middle Aged (40-59 Years) Non-Insulin Dependent Diabetics

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ABSTRACT

Type 2 diabetes is a global crisis that threatens the health and economy of all nations, particularly developing countries. This epidemic is primarily driven by rapid urbanization, nutrition transition, and increasing sedentary lifestyle. The present study was conducted to study the effect of amla powder and turmeric powder consumption on middle aged (40-59 years) non-insulin dependent diabetics. Multistage random sampling technique was used in the present study. For sample selection door to door survey was conducted in Moti Katra and Sheetla Gali area of Agra. The total sample size of the study was 18 diabetic non insulin dependent respondents. The subjects were divided in two groups (Experimental n_1 =9 and control group n_2 = 9). In the present study, more females were found to be suffering from type 2 diabetes than males. Amla powder and turmeric powder was consumed by experimental group diabetic respondents for 45 days. Fasting blood sugar level of experimental group was significant on 15th day, 30th day and 45th day while post prandial blood sugar level was significant on 30th and 45th day. On 45th day both fasting and post prandial blood sugar level were statistically significant ($p<0.05$). NSI diet calculator and website www.nutrispoon.in (2014) was used for calculating 24 hour diet recall of both experimental and control group.

Key words: *Middle aged, Amla powder, Turmeric powder, Non-insulin dependent diabetics, Fasting, Post prandial blood sugar level.*

INTRODUCTION

Diabetes is a chronic disease that occurs either when the pancreas does not produce insulin or when the body cannot effectively use the insulin it produces. Ayurvedic herbs have become a subject of interest because of their beneficial effects on human health. Several plant extracts have been examined for their anti-diabetic properties in an attempt to recognize alternative treatment strategies[4].

Amla being the richest source of ascorbic acid that is preserved by the presence of galleoellagi tannis, may be used as a supportive therapy for diabetes and other diseases[7]. Singh *et al*.,[5] reported that amla is richest source of vitamin C. Vitamin C content of amla increases in the sun dried amla for example 100 gm. of fresh amla gives 600 mg of Vitamin C, then when it is sundried, its content increases to 1500 to 1600 mg.

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Curcumin has been shown to improve the symptoms associated with diabetes. The efficacy of curcumin has been widely observed in reducing various diabetic secondary complications such as diabetic nephropathy[6], retinopathy[2] and wound healing[3].

OBJECTIVES

1. To study the demographic characteristics of middle aged (40-59 years) patients suffering from non-insulin dependent diabetes mellitus.
2. To assess and compare the life style characteristics of experimental and control group non-insulin dependent middle aged diabetic subjects.
3. To assess and compare the dietary pattern of experimental and control group non-insulin dependent middle aged diabetic subjects.
4. To study the effect of amla powder and turmeric powder consumption on fasting and postprandial blood sugar level of middle aged diabetic subjects.

MATERIAL AND METHODS

The methodological aspects of the study are discussed under the following heads:

A. SELECTION AND PROCUREMENT OF THE HERBS

Fresh amla fruit was procured from Sabji mandi of Moti katra, Agra. Total raw amla procured was 10kg.Dehydrated turmeric was procured from Rawat pada market, Agra. Total dehydrated turmeric procured was 1.25kg.

DEHYDRATION OF HERBS

a. Dehydration of Amla:

Fresh amla fruit
↓
Washing 2 to 3 times
↓
Blanching 3 to 4 minutes
↓
Separation of seed and pulp
↓
Cut into small pieces
↓
Spread out on white cotton cloth
↓
Covered with malmal cloth
↓
Dehydration for 16-18 days
↓
Finely grinded
↓
Sieved
↓
Kept in airtight container before packaging

b. Dehydration of turmeric

Dehydrated turmeric procured from market
↓
Coarsely broken in small pieces
↓
Finely grinded
↓
Sieved
↓
Kept in airtight container before packaging

B. SELECTION OF LOCALE

The study was carried out in the area of Moti Katra and Sheetla gali area of Agra. The reason of selecting these areas was convenience for the investigator.

C. SCREENING OF SUBJECTS

Multistage stratified random sampling technique was used for screening of diabetic respondents. Door to door survey was carried out for screening of diabetic respondents. Total number of selected diabetic respondents was 22. Out of them, 18 diabetic respondents were randomly selected for the purpose of present research. Diabetic respondents were divided in two groups (experimental and control group). Nine diabetic respondents (n_1=9) were randomly screened for experimental group and remaining nine diabetic respondents (n_2=9) were randomly assigned to control group.

D. SCHEDULE PREPARATION FOR ADMINISTRATION OF AMLA POWDER AND TURMERIC POWDER

After screening of 18 diabetic respondents, out of them 9 diabetic repondents were selected randomly for the purpose of amla and turmeric powder feeding trial. Research was started from 1 february 2016 (stability period) and after 15 days, feeding of amla powder and turmeric powder was started and continued regularly for 45 days.

E. PACKAGING OF HERBS FOR FEEDING TRIAL IN EXPERIMENTAL GROUP:

For experimental group feeding trial turmeric powder and amla powder were packed in small packets.

	AMLA POWDER	**TURMERIC POWDER**
No. of Packets	405	405
Weight of packets	2.5gm	2.5

F. DEVELOPMENT OF THE SCHEDULE:

The schedule consisted of the following sections: General information, family background and history of diabetes mellitus, general health, life style, symptoms related to diabetes, dietary Intake, glucose testing of subjects, physical activity, medication, medical care.

G. STANDARDIZATION OF TOOLS AND TECHNIQUES USED IN THE STUDY

Glucometer was standardized before using it on the research respondents. Different recipes were standardized for taking 24 hour diet recall using different utensils.

a. Glucometer: Johnson and Johnson one touch select simple blood glucose monitoring system was standardized from medical store.

Steps for standardization of glucometer are as follows:

- **Step 1:** Set the battery of glucometer.
- **Step 2:** Set the strip in the glucometer.
- **Step 3:** Pricked finger.
- **Step 4:** When glucometer shows the sign of blood drop, it was ready to enter the sample.
- **Step 5:** Record the readings i.e. fasting and post prandial blood sugar level.

b. Recipes for 24 hour diet recall : Dry vegetable, jhol vegetable, gravy vegetable, pulse, whole pulse and chappaties were standardised for the purpose of taking dietary intake.

AMOUNT OF RAW VEGETABLE AND COOKED VEGETABLE		
RECIPES	**RAW VEGETABLE (gm)**	**COOKED VEGETABLE (gm)**
Dry vegetable(gm)	250	200
Jhol vegetable(gm)	250	225
Greavy vegetable(gm)	200	185
Moong dal(gm)	50	150
Rajma(gm)	50	200

After the standardization of vegetables, pulse and whole pulse, different sizes of bowls (A,B,C,D) were used for calculating the dietary intake.

RECIPIES	**BOWLS**			
	A	**B**	**C**	**D**
Dry vegetable(gm)	50	75	100	125
Jhol vegetable(gm)	100	125	150	175
Greavy vegetable(gm)	100	125	150	175
Moong dal(gm)	100	150	200	250
Rajma(gm)	100	150	200	250

Chapaties : For the standardization of chapaties , different types of cut-outs were made.

WHEAT FLOUR (gm)	**CHAPATIES(gm)**			
	A	**B**	**C**	**D**
RAW WEGHT (gm)	25	35	45	55
COOKED WEIGHT (gm)	35	45	55	65

H. ADMINISTRATION OF AMLA POWDER AND TURMERIC POWDER

After completing phase II, administration of amla powder and turmeric powder was started. This section consisted of following steps:

STEPS	**DAYS**	**ADMINISTRATION OF AMLA POWDER AND TURMERIC POWDER**
1	Before 15^{th} day	Stability period without administration of amla powder and turmeric powder
2	0 day	Starting the feeding trial of selected experimental respondents
3	15^{th} day	2^{nd} part of feeding trial
4	30^{th} day	3^{rd} part of feeding trial
5	45^{th} day	4^{th} part of feeding trial

I. MEASUREMENT OF FASTING AND POST PRANDIAL BLOOD SUGAR ON EVERY 15^{TH} DAY :

Glucometer was used for the measurement of fasting and post prandial blood sugar level. Testing of fasting and post prandial blood sugar level was taken for both control and experimental group.

BLOOD SUGAR LEVEL mg/dl			
Day	**Time**	**Fasting**	**Post prandial**
Before 15th day			
0 day			
15th day			
30th day			
45th day			

J. 24 HOUR DIETARY RECALL FOR 7 CONSECUTIVE DAYS

During the research, 24 hour dietary recall was taken for both groups (experimental and control) using standardized recipes, utensils and cut-outs. First all the cooked amounts were changed into raw amount and then NSI diet calculator was used for calculating the nutrients from raw amounts. Nutrispoon website was also used for calculating dietary intake of respondents.

K. DIETARY ANALYSIS

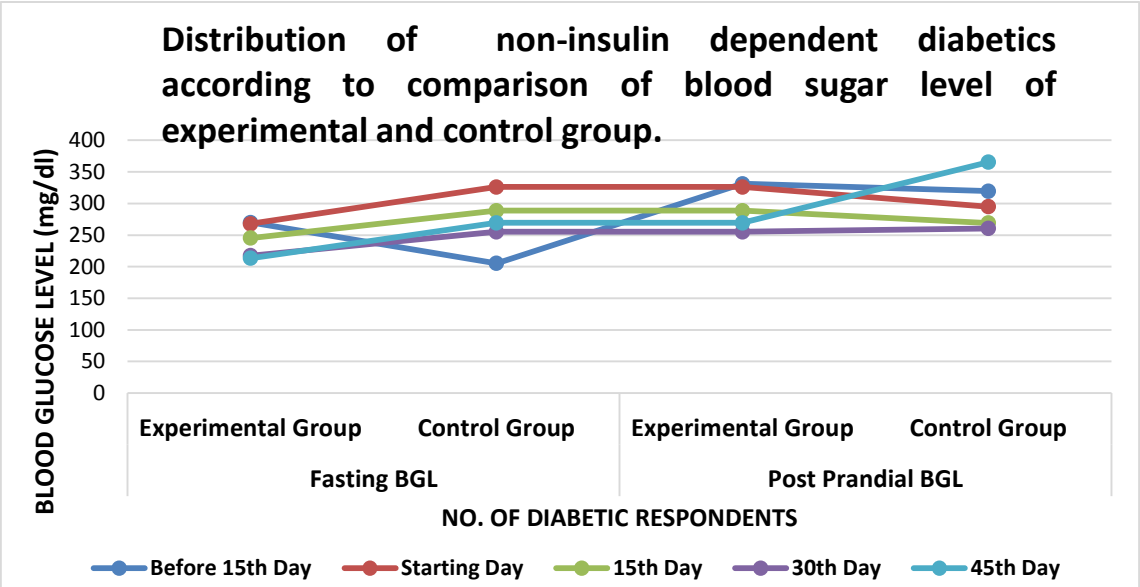
For dietary analysis, first all the data was converted to raw form and then entered in NSI diet calculator. The following nutrients were calculated: Energy (kcal), protein (gm), fat (gm), zinc (mg), calcium (mg), phosphorous (mg), vitamin A (mcg), thiamine (mg), riboflavin (mg), niacin (mg), vitamin C(mg), iron(mg), folic acid (mcg) and sodium(mg).For the calculation of carbohydrate, Indian Council of Medical Research's exchange list (2012) was used.

RESULT AND DISCUSSION

1. Distribution of the non-insulin dependent diabetics according to comparison of blood sugar level of experimental and control group:

Fasting Blood Glucose Level	**Experimental Group**	**Control Group**	**t-Test**	**p-value**
	Mean±SD (mg/dl)	**Mean±SD (mg/dl)**		
Before 15th Day	270.00±92.52	205.33±64.06	0.3010	0.3204
Starting Day	267.89±90.30	198.78±98.27	2.2250	0.7594
15th Day	245.33 ±9.64	152.56±74.28	3.7104	0.0260*
30th Day	217.56 ±94.53	162.89±58.59	5.3292	0.0101*
45th Day	213.56 ±85.84	212.11±68.15	4.4510	0.0100*
***This result is Statistically significant at $p < .05$.**				
Post Prandial Blood Glucose Level	**Experimental Group**	**Control Group**	**t-Test**	**p-value**
	Mean±SD (mg/dl)	**Mean±SD**		
Before 15th Day	331.11±93.90	319.56±128.26	0.2740	0.5790
Starting Day	326.11±72.62	295.11±101.89	2.0209	0.4392
15th Day	288.78±85.05	269.22±95.84	1.5623	0.1093
30th Day	255.22 ±83.31	260.56±99.87	3.6906	0.0141*
45th Day	269.33 ±91.94	365.44±77.78	3.9781	0.0124*

Above table reveals distribution of the non-insulin dependent diabetics according to comparison of blood sugar level of experimental and control group statistically significant comparison of fasting blood sugar of both group was observed at 15th day, 30th day and 45th day of the feeding trial. Statistically significant comparison of post prandial blood sugar of both groups was observed at 30th day and 45th day of the feeding trial.



2. Distribution of the non-insulin dependent diabetics according to correlation between fasting and post prandial blood sugar level of experimental group:

Fasting blood sugar level (mg/dl)				
	Mean ± St. Deviation (mg/dl)	**Correlation Coefficient**	**R-Test Value**	**p-value**
Before 15th Day	270±92.52			
0 Day	267.89±90.3			
15th Day	245.33±97.64	0.979	0.950	0.001*
30th Day	217.56±94.53	0.951	0.933	0.002*
45th day	213.57±85.31	0.901	0.867	0.002*

*Statistically significant at p<0.05

Post Prandial blood sugar level (mg/dl)				
	Mean±St. Deviation (mg/dl)	**Correlation Coefficient**	**R-Test Value**	**p-value**
Before 15th Day	331.11±93.9			
0 Day	326.12±72.62			
15th Day	288.78±85.05	0.901	0.783	0.001*
30th Day	255.22±83.31	0.857	0.816	0.007*
45th day	269.33±91.94	0.856	0.971	0.001*

*Statistically significant at p<0.05

Above table explains, by normal standards, the association between the reading of Fasting and Post Prandial Blood glucose with 15th,30th and 45th days would be considered statistically significant and positive.

CONCLUSION

On the basis of the results obtained from the present study entitiled "**Effect of amla powder and turmeric powder consumption on middle aged (40-59 years) non-insulin diabetics"** it can be concluded that in middle age prevalence of type 2 diabetes was very high. More females suffered from type 2 diabetes than males. Out of the 18 diabetic respondents, 12 females suffered from type 2 diabetes.Fasting and post prandial blood sugar level was lowered with the consumption of

amla powder and turmeric powder for 45 days. Fasting blood sugar level was significant at 15th day, 30th day and 45th day while post prandial blood sugar level was significant at 30th and 45th day. On 45th day both fasting and post prandial blood sugar level were statistically significant ($p < .05$).

Mean and standard deviation of fasting and post prandial blood sugar level of experimental group respondents on starting day and 45th day were 267.89±90.30 mg/dl ,213.56±85.84 & 326.11±72.62 mg/dl & 269.33±91.94 mg/dl respectively.

REFERENCES

1. Gupta, A., Pictorial portion size of recipes. Retrieved from http://www..nutrispoon.in/pictorialportionsize. (2014).
2. Kowluru, R., A., & Kanwar, M., Effects of curcumin on retinal oxidative stress and inflammation in diabetes, *Nutrition & Metabolism*, **4:** 1-8 (2007).
3. Panchatcharam, M., Miriyala, S., Gayathri, V.S. & Suguna, L.**,**Curcumin improves wound healing by modulating collagen and decreasing reactiveoxygen species, *Molecular and Cellular Biochemistry*, **290(1-2):** 87-96 (2006).
4. Singh, K.P., & Verma, B., Role of ayurvedic herbs in madhumeha (Diabetes mellitus). *International Journal of Ayurvedic and Herbal medicine,* **3(2):** 1136-1144 (2013).
5. Singh,E., Sharma, S., Pareek, A., Dwivedi, J., Yadav, S., & Sharma, S., Phytochemistry, traditional uses and cancer chemopreventive activity of Amla (*Phyllanthusemblica*): The Sustainer. *Journal of Applied Pharmaceutical Science* **02(01):** 176-183 (2011).
6. Sharma,S., kulkarni, S.K., Agarwal, J.N. & Chopra, K., Curcumin improves wound healing by modulating collagen and decreasing creative oxygen spices. *Molecular and Cellular Biochemistry,* **290:** 87-96 (2006).
7. Walia, K., & Boolchandani, R.,Role of amla in Type 2 Diabetes Mellitus - A Review. *Research Journal of Recent Sciences*, **44(ISC-2014):** 31-35 (2015).
8. World Health Organization. Fact Sheet No.312: What is Diabetes? Retrieved from: http:// www.who.iny/mediacentre/factsheets/fs312/en/ (2009).