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CORRELATION OF BLOOD SUGAR WITH BMI IN TYPE 2 DIABETES SUBJECTS

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ABSTRACT

People have greater risk of diabetes due to improper dietary practice, unhealthy life style, lack of physical exercise. The present study was conducted to correlate the blood sugar level with BMI in type 2 diabetes subjects. Multistage stratified sampling technique was used for selecting 100 samples in both males and females and an interview scheduled was evolved to collect information regarding socio-economic profile, dietary pattern *etc*. Dietary intake between male and female diabetics was very highly significant but age , BMI, nutrients intake *etc*. between male and females diabetics were insignificant.

Figure : 00 References : 10 Tables : 08
KEY WORDS : Body Mass Index, Diabetes mellitus, Fasting Glucose .

Introduction

Diabetes mellitus is a chronic metabolic disorder that prevents the body to utilize glucose completely or partially. It is characterized by high blood glucose concentration in the blood and alteration in carbohydrate, protein and fat metabolism. This can be due to failure in the formation of insulin. Observational studies addressing physical activity, weight loss, and dietary intake of whole grains and fiber *etc*. provided evidences for factor that might delay or prevent Type-2 diabetes[1]. . Prevalence of Type 2diabetes has increased dramatically with 1 million people reported to have been diagnosed with Type 2diabetes in 1994, increasing to 382 million by 2013, and with prediction of 592 million by 2035. Type 2diabetes is responsible for the deaths of approximately 1.5 million people annually and is a risk factor for cardiovascular disease (CVD), which kills 13 million people worldwide every year, accounting for 25% of all deaths, thereby increasing the economic burden within global healthcare systems[10]. People are at greater risk of diabetes due to improper dietary practice, unhealthy life style, socioeconomic situation, mental stress and lack of physical exercise[2,7]. Too much fat especially saturated from meat or dairy products contains too much sugars calories and not enough whole grains, fruits and vegetables are the primary dietary problems challenging the population. The present study was conducted to correlate the blood sugar level with BMI in type 2 diabetes subjects.

Material and Methods

The study was carried out in 100 diabetic male and female diabetic subjects from local hospitals from Agra city. Multistage stratified random sampling technique was used in the selection of samples. In this study relevant information regarding socio-economic profile, dietary pattern *etc*. from the patients using the predesigned schedules was collected. The study was carried out under the following objectives:

1. To assess the health status through BMI in male and female diabetic patients aged between 40- 50 years (All subjects had Type-2 diabetes)

TABLE- 1 : Distribution of Male and Female diabetic patients according to age

Age in Years	Sex of the respondents			
	Male		Female	
	No.	%	No.	%
30-35	7	14.0	8	16
35-40	5	10.0	13	25.00
40-45	10	20.0	27	51.92
45-50	13	26.0	5	9.61
50 and Above	15	30.0	2	3.84
Total	50	100.0	50	100.00

2. To correlate the blood sugar level with BMI among male and female diabetic patients.

Statistical analysis was performed to find out the effect of all factors on diabetes with the help of mean SD, t-test and to see the significance at 5% level. Correlation coefficient was also applied to assess the relationship between blood sugar level and exercise.

Result and Discussion

Table-1 reveals the distribution of male and female respondents according to age**.** Out of 50 male diabetic patients, majority of them (30.00%) were in the age group of 50 yrs and above, followed by 26.00% in the age group of 45-50 yrs and the minimum 10.0% in the age group of 35-40 years. Out of the female diabetic patients, majority of them (28.0%) were in the age group of 35-40 years, followed by 22.0% were in the age group of 45-50 years and the minimum 14.0% were in the age group 40-45 yrs. WHO reported that most of the surveyed population (60%) and diabetic patient (54.8%) were in the age group of 30-45 years. It shows diabetes in young adults is common.

Table-2 highlights the distribution of male and female respondents according to height. Out of the 100 diabetic patients, majority of them (50.00%) were having height of 155 cms, followed by 30.00% having the height of 165 cms and above and minimum (20.00%) were having the height of 145 cms.Out of the male diabetic patients, majority of them (45.83) were having the height of 165 cms and above, , followed by 41.61 % having the height of 155 cms and minimum (12.50%) were having the height of 145 cms.Out of the female diabetic patients, majority of them (57.69%) were having the height of 155 cms,, followed by 26.92 % having the height of 145 cms and minimum (15.38%) were having the height of 165 cms and above. Further Table shows that the mean height of diabetic subjects was found to be 160.33 cms which was more among male diabetic subjects (163.38 cms) as compared to female diabetic subjects (157.52cms)Statistically Significant difference regarding mean height between male and female diabetic subjects was observed ($t= 4.247$, $p<0.05$)[3].

Table-3 highlights the distribution of male and female respondents according to weight. Out of the 50 male diabetic patients, majority of them (50.00%) were having the weight of 70 – 80 kg,, followed by 44.00% having the weight of80 kg and above and the minimum (6..00)were having 60-70 kgs weight. Out of the female diabetic patients, majority of them (46.00%) were having the weight of 60 -70 kg, followed by 40.00% having the weight of 50 -60 kg and minimum (2.00%) were having the weight of 80 kg and above.

Table-4 highlights the distribution of male and female respondents according to body mass index. Out of the 50 male diabetic patients, majority of them (74.00%) were having the body mass index of 25 – 30 kg,, followed by 20.00% having the body mass index of 20-25and the minimum (6..00)were having the body mass index of 30 and above. Out of the female diabetic patients, majority of them (54.00%) were having the body mass index of 20 – 25 , followed by 44.00% having the body mass index of 25-30and the minimum (2..00)were having the body mass index of 30 and above[5,6,7,9].

Table-5 reveals the distribution of the male and female respondents according to blood sugar level. Out of 50 diabetic patients, majority of them (26.00%) were

TABLE-2 – Distribution of the Male and Female respondents according to Height

Height in cms	Sex of the respondents			
	Male		Female	
	No.	%	No.	%
140-150	0	0.0	3.0	6.0
150-160	2	4.0	34	68.0
160 -170	21	42.0	11	22.0
170-180	21	42.0	2	4.0
180 and Above	6	12.0	0	0.0
Total	50	100.0	50	100.0

TABLE-3 : Distribution of the Male and Female respondents according to weight

Weight in Kgs	Sex of the respondents			
	Male		Female	
	No.	%	No.	%
50 -60	0	0.00	20	40.00
60 -70	3	6.00	23	46.00
70 – 80	25	50.00	6	12.00
80 and Above	22	44.00	1	2.00
Total	50	100.00	50	100.00

TABLE-4 : Distribution of the Male and Female respondents according to body mass index

Body Mass Index	Sex of the respondents			
	Male		Female	
	No.	%	No.	%
20-25	10	20.00	27	54.00
25-30	37	74.00	22	44.00
30 and above	3	6.00	1	2.00
Total	50	100.00	50	100.00

having the fasting blood sugar level of 150 and above, followed by 24.00% blood sugar level of 120 -130 and the minimum 4.00%. having the fasting blood sugar level of 100 -110. Out of the female diabetic patients, majority of them (22.0%) were having the fasting blood sugar level of 120 -130 followed by 16.0.00% having 130 -140 blood sugar level of and the minimum 4.00%. having the

TABLE-5 : Distribution of the Male and Female respondents according to fasting blood sugar level

Blood Sugar level mg/dl	Sex of the respondents			
	Male		Female	
	No.	%	No.	%
80-90	0	0.0	2	4.0
90-100	4	8.0	7	14.0
100-110	2	4.0	7	14.0
110-120	5	10.0	6	12.0
120-130	12	24.0	11	22.0
130-140	6	12.0	8	16.0
140-150	8	16.0	7	14.0
150 and above	13	26.0	2	4.0
Total	50	100.0	50	100.0

fasting blood sugar level of 150 and above, & 80 – 90 respectively. This difference might be occurred due to performing exercise, restricted diet and taking proper medicine.

Table-6 reveals the distribution of the male and female respondents according to blood sugar level. Out of 50 diabetic patients, majority of them (38.00%) were having the blood sugar level after 2 hrs of 190 and above, followed by 14.00% blood sugar level of 170 -180 and the minimum 2.00%. having the blood sugar level after 2 hrs of 130 -140 of 100 -110 respectively. Out of the female diabetic patients, majority of them (26.0%) were having the blood sugar level after 2 hrs of 190 and above followed by 18.0.00% having 130 -140 blood sugar level of and the minimum 4.00%. having the fasting blood sugar level after 2 hrs of 120 -130 and 160 -170 respectively.

Correlation between blood sugar level (Fasting & pp) with BMI of the male diabetic patients (Table-7) was

TABLE-6 : Distribution of the Male and Female respondents according to blood sugar level after 2 hours

Blood Sugar level mg/dl	Sex of the respondents			
	Male		Female	
	No.	%	No.	%
100-110	1	2.0	2	4.0
110-120	0	0.0	2	4.0
120-130	4	8.0	1	2.0
130-140	1	2.0	9	18.0
140-150	4	8.0	6	12.0
150 -160	3	6.0	5	10.0
160 -170	6	12.0	1	2.0
170-180	7	14.0	3	6.0
180 -190	5	10.0	8	16.0
190 and above	19	38.0	13	26.0
Total	50	100.0	50	100.0

TABLE-7 : Correlation between BMI with blood sugar levels among Male diabetic patients

Parameter	Statistical Values				
	Mean	SD	r	t	p
Body Mass Index	24.64	1.86			
Fasting Blood sugar Level	140.84	37.36	+0..095	0.661	>0.05
After 2 hrs Blood sugar Level	188.08	46.31	+0.128	0.894	>0.05

TABLE-8 : Correlation between BMI with blood sugar level among Female diabetic patients

Parameter	Statistical Values				
	Mean	SD	r	t	p
Body mass index	23.04	1.59			
Fasting Blood sugar Level	120.48	19.87	+0.089	0.619	>0.05
After 2 hrs Blood sugar Level	172.92	45.52	+0.009	0.062	>0.05

observed. Statistically, positive and insignificant correlations were observed between BMI of the male diabetic patients with blood sugar level (Fasting) and blood sugar level (pp) even at 5% level of significance. An increase in fasting plasma glucose in the normal range was associated with an increase in the incidence of IGT (Impaired glucose Tolerance)[8].

Table-8 highlights the correlation between blood sugar level (Fasting & pp) with BMI of the female diabetic patients. Statistically, significant correlations were observed between BMIof the female diabetic patients with blood sugar level (pp) <0.05 at 5% level of significance. An increase in fasting plasma glucose in the normal range is associated with an increase in the incidence of IGT (Impaired glucose Tolerance)[8].

Conclusion

From the study it is evident that nutritional status of both male and female diabetic patients was highly significant but on contrary the results like age, blood sugar level, food habit profile *etc.* in both diabetic patients showed insignificant. It may be due to poor nutritional status, poor diet and lack of exercise etc. From the above observations, it can be concluded that exercise affects the blood sugar level in male as well as in female respondents. Thus, alongwith other forms of treatment mild regular physical exercise played an important role in primary prevention of Type-2 diabetes.

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