A Comparative Study of Nutritional Status among Type 2-Diabetic Males and Females

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Abstract: *Diabetes mellitus is a group of disease characterized by high blood glucose concentration in the blood and alteration in carbohydrate, protein and fat metabolism. People are greater risk of diabetes due to improper dietary practice, unhealthy life style, lack of physical exercise. The present study was conducted a comparative study of nutritional status among Type- 2 diabetic males and females. Multistage stratified random sampling technique was used for selecting 100 samples in both male and females and an interviewed schedule was developed to collect information regarding socioeconomic profile, dietary pattern etc. Dietary intake between males and females diabetic were highly significant but age, BMI, etc. between males and females diabetic were insignificant. Consumption of high fat and carbohydrate diet was revealed as the major contributing cause of disease in both males and females.*
Keywords: *Diabetes, blood sugar, body mass index.*

I. Introduction

Diabetes is a group of metabolic diseases in which there are high blood levels over a prolonged period that effects on all parts of the body. It is characterized by high blood glucose concentration in the blood and alteration in carbohydrate, protein and fat metabolism. In contrast, insulin deficiency in a poorly controlled exercise results in increases is glucose concentration and free fatty acids release continues with minimal uptake. 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].Nutritional status is the conditioned of health of individuals as influenced by the utilization of the nutrient. It can be determined only by the correction of information through a medical and dietary history, although physical examination and appropriate laboratory investigations (robinson1978).Now days the prevalence of Type -2 diabetes has been rapidly rising worldwide. People are greater risk of diabetes due to improper dietary practice, unhealthy life style, socioeconomic situation, mental stress and lack of physical exercise[2, 3]. Too much fat especially saturated from meat or dairy product contains too much sugars calories, and not enough whole grains, fruits and vegetables are the primary dietary problem challenging the population.The present study is carried out tocompare the nutritional status among male and female diabetic patients and correlate the nutritional status with body mass index among male and female diabetic patients.

II. Material And Methods

The study is carried out in 100 diabetic male and female type -2 diabetic subjects from local hospitals from Agra city. Multistage stratified random sampling technique was used in the selection of 100 samples, 48 males and 52 females. An interview schedule was evolved to collect the information regarding socio-economic profile, dietary information and specific information regarding this disease. In this study to assessed the health status through BMI in both male and female type 2- diabetic subjects aged between 35 – 75 years. Nutrient intake was assessed by 24 hrs food recall method. The subjects were asked to report the food items consumed along with their raw ingredients. These were recorded in standard volumetric method and later it is converted in raw weight of foods i.e. groups and nutritive values was calculated using the food tables as per recommended by ICMR.Statistical analysis was performed to find out the 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 body mass index with various nutrients intake by them.

Table 1 – Distribution of male and female respondent according to age

Age in Years	Sex of the respondents				Total	
	Male		Female			
	No.	%	No.	%	No.	%
35-45	6	12.50	5	9.61	11	11.00
45-55	4	8.33	13	25.00	17	17.00
55-65	16	33.33	27	51.92	45	45.00

65-75	16	33.33	5	9.61	21	21.00
75-85	6	12.50	2	3.84	8	8.00
Total	48	48.00	52	52.00	100	100.00
Mean	61.08		55.17		58.01	
SD	11.46		8.16		16.31	
t	2.088					
P	<0.05					

Table-1 reveals the distribution of male and female respondent according to age**.**Out of 100 diabetic patients, majority of them (45.00%) were in the age group of 55-65 yrs, followed by 21.00% in the age group of 65-75 yrs and the minimum 8.00% in the age group of 75-85 years. Out of the male diabetic patients, majority of them (33.33%)were in the age group of 55-65 and 65-75 years, followed by 12.50% each in the age group of 75-85 years and 35-45 yrs and the minimum 8.33% were in the age group 45-55 yrs.Out of the female diabetic patients, majority of them (51.92%) were in the age group of 55-65 years, followed by 25.00% in the age group of 45-55 years and the minimum 3.84% were in the age group 75-85 years. Further table shows that mean age of male diabetic patients was found to be 58.01 yrs which was more among male diabetic patients (61.08) as compared to female diabetic patients (55.17 yrs). Statistically, significant difference regarding mean age was observed between male and female diabetic patients (t = 2.988, p <0.05)[4].

Table 2 – Distribution of the Male and female respondents according to blood sugar level

Blood sugar level (mg/dl)	Sex of the respondents				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Below 100	11	22.91	5	9.61	16	16.00
100-150	16	33.33	12	23.07	28	28.00
150-200	8	16.67	12	23.07	20	20.00
200-250	6	12.50	18	34.61	24	24.00
250-300	7	14.58	5	9.61	12	12.00
Total	48	48.00	52	52.00	100	100.00
Mean	156.42		176.00		166.60	
SD	65.25		55.43			
t	1.621					
P	>0.05					

Table-2 reveals the distribution of theMale and female respondentsaccording to blood sugar level. Out of 100 diabetic patients, majority of them (28.00%) were having the present blood sugar level of 100 -150, followed by 24.00%having the present blood sugar level of 200 -250 and the minimum (12.00%) werehaving the present blood sugar level of 250 -300. Out of the male diabetic patients, majority of them (33.33%)were having the present blood sugar level of 100-150, followed by 22.91%having the present blood sugar level of below 100 and minimum 12.50% were having the present blood sugar level of 200 -250. Out of the female diabetic patients, majority of them (23.61%)were having the present blood sugar level of 200-250, followed by 23.07%having the present blood sugar level of 100–150 and 150-250 and minimum 9.61% each were having the present blood sugar level of below 100 and 200-300 respectively. Statistically no significant difference regarding mean present blood sugar level was observed between male and female diabetic patients even at 5% level of significance. This difference might be occurred due to performing exercise, restricted diet and taking proper medicine[6].

Table 3 – Distribution of the Male and female respondents according to body mass index

Body Mass Index	Sex of the respondents				Total	
	Male		Female			
	No.	%	No.	%	No.	%
15-20	8	16.66	3	5.76	11	11.00
20-25	19	39.58	25	48.07	44	44.00
25-30	14	29.16	16	30.76	30	30.00
30-35	7	14.58	8	15.38	15	15.00
Total	48	48.00	52	52.00	100	100.00
Mean	24.38		25.25		24.83	
SD	3.88		4.07		4.00	
t	1.092					
P	>0.05					

Table-3 reveals the distribution of theMale and female respondentsaccording to body mass index. Out of 100 diabetic patients, majority of them (44.00%) were body mass index of 20-25, followed by 30.00.00%were body mass index of 25-30and the minimum 15.00%.werehaving the body mass index of 30-

35. Out of the male diabetic patients, majority of them (39.58%)were having the body mass index of 20-25, followed by 29.16%having body mass index of 25-30 and minimum 16.66% were having the body mass index of 15-20. Out of the female diabetic patients, majority of them (48.07%)were having the body mass index of 20-25, followed by 30.76%having body mass index of 25-30 and minimum 15.38% were having the body mass index of 30- 35respectively. further table shows that the mean body mass index of diabetic patients was found to be 24.83 which was more among male diabetic patients (24.38) as compared to female diabetic patients.(25.25).Statistically no significant difference regarding mean body mass index was observed between male and female diabetic patients even at 5% level of significance (t=1.092,p>0.05)[3,7]

Table4-Correlation between body mass index with various nutrient intakes among male diabetic patients.

Parameters	Unit	Statistical Values				
		Mean	SD	r	t	p
Body Mass Index		24.38	3.88			
Calories	Kcal	1480.10	120.26	-0.248	1.736	>0.05
Protein	gm	31.67	1.58	-0.136	0.931	>0.05
Calcium	mg	588.07	53.93	-0.204	1.413	>0.05
Vitamin A	µg	1640.64	118.86	+0.057	0.387	>0.05
Vitamin B_1	mg	1.13	0.08	-0.175	1.206	>0.05
Vitamin C	mg	28.33	15.28	+0.223	1.552	>0.05
Iron	mg	26.01	3.11	-0.066	0.449	>0.05
Fat	gm	30.84	2.04	+0.014	0.095	>0.05
Riboflavin	mg	0.60	0.05	+0.147	1.008	>0.05
Niacin	mg	13.33	1.53	+0.151	1.036	>0.05
Carbohydrate	gm	226.51	9.34	-0.139	0.952	>0.05
fiber	gm	6.73	0.91	-0.280	1.978	<0.05
sodium	mg	82.46	8.53	-0.110	0.751	>0.05

Table-4 reveals the correlation between body mass indexwith various nutrient intakes among male diabetic patients. Positive and insignificant correlations were observed between the body mass indexwith nutrient intake of vitamin A, Vitamin C,fat, riboflavin andniacin were observed among the malediabetic patienteven at 5% level of significance.Negative and significant correlations between body mass index with nutrient intake of fiber was observed among the male diabetic patients (p<0.05) i.e.as the body mass index increases the nutrient intake of fibre decreases and *vice-versa*. However, negative and insignificant correlations were observed between body mass index with nutrient intake of calories, calcium protein,sodium iron,vitamin B_1, and carbohydrate among the male diabetic patients even at 5% level of significance.

Table 5- Correlation between body mass index with various nutrient intakes among female diabetic patients.

Parameters	Unit	Statistical Values				
		Mean	SD	R	t	p
Body mass index	Year	25.25	4.07			
Calories	Kcal	1513.52	113.24	+0.448	3.543	<0.05
Protein	gm	32.25	1.97	+0.017	0.120	>0.05
Calcium	mg	586.26	44.24	+0.056	0.397	>0.05
Vitamin A	µg	1689.67	150.39	-0.004	0.028	>0.05
Vitamin B_1	mg	1.11	0.07	+0.145	1.036	>0.05
Vitamin C	mg	26.74	10.14	-0.023	0.163	>0.05
Iron	mg	26.36	2.46	-0.145	1.036	>0.05
Fat	gm	30.71	1.90	-0.100	0.711	>0.05
Riboflavin	mg	0.63	0.11	-0.192	1.383	>0.05
Niacin	mg	13.28	1.65	+0.087	0.404	>0.05
Carbohydrate	gm	227.93	10.18	-0.188	1.353	>0.05
fiber	gm	6.51	0.89	+0.201	1.451	>0.05
sodium	mg	80.43	7.22	-0.312	2.322	<0.05

Table-5 depicts the correlation between body mass index with various nutrient intakes among female diabetic patients. Positive and significant correlations were observed between the body mass index with nutrient intake of calories were observed among the female diabetic patients (p<0.05) i.e.as the body mass index of female diabetic patients increases, nutrient intake of calories also increases and *vice-versa*. While positive and insignificant correlations between body mass index withnutrient intake ofprotein,calcium, VitaminB_1, niacin and fiber were observed among the female diabetic patients even at 5% level of significance. Negative and significant correlationbetween body mass index withnutrient intake ofsodium was observed among the female diabetic patients (p<0.05) i.e. as the body mass index increases, nutrients intake of sodium decreases and *vice-versa*. However negative and insignificant correlations were observed between body mass index with nutrient

intake ofvitaminA, fat, riboflavin, Vitamin C, ironand carbohydrate among the female diabetic patients were observed even at 5% level of significance.

III.   Conclusion

From the study it is evident that nutritional status of both male and female diabetic patients were highly significant but contrary the results like age, BMI, 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. So, as per our study, the diabetes can be controlled by regular exercise, sugar restricts diet and good nutritional status, which may also help prevent diabetes. This mandates systemic screening as well as elimination of risk factors such as poor life style, obesity and metabolic disturbances in these type of subjects.

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