

NUTRITIONAL INTAKE OF YOUNG DIABETICS

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Summary:

This study presents preliminary observations on dietary intake of 52 young diabetics representing different types of diabetes i.e. FCPD, IDDM and NIDDM. FCPDs consumed less amount of calories and protein compared to the other diabetics and when compared with their respective recommended dietary allowances, their intake of calories and proteins was quite poor. Besides a low calorie and protein intake jawar was their common staple food.

Introduction

The type of diabetes found in the Western World and among the affluent Asians is usually associated with over nutrition as in non insulin dependent diabetes mellitus (NIDM). But the distinct diabetes syndrome peculiar to tropical countries malnutrition related diabetes mellitus (MRDM) is associated with malnutrition (1). It is known that childhood kwashiorkor can cause disturbances of carbohydrate metabolism, however this is reversible by provision of proper nutrition. Ethiopia, which has suffered so many famines does not show any significant incidence of MRDM. This relationship of malnutrition to diabetes is still not very clear. Certain foods consumed as staple food in the tropical countries i.e. cassava are said to cause pancreatic diabetes (1).

In India, there are few comparative studies of dietary intake of different types of diabetics. The present study outlines the preliminary observations of a study of different types of young diabetics, to find the differences in their dietary intake and the possible reasons for this.

Material and Methods

52 young diabetics were studied, 15 were fibro calcific pancreatic diabetes (FCPD) s, 17 insulin dependent diabetes (IDDM)s, and 20 NIDDM. Their ages, BMI and socio-economic backgrounds were representative of the type of diabetes being studied (Table 1).

Daily nutrient intake at home was evaluated before any dietary advice was given. This was done using the 24 hr. recall method and food exchange system. The staple foods consumed were also recorded. The intakes of the IDDMs and

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Table 1
Comparison of diabetes—FCPD, IDDM, NIDDM

	FCPD (15)	IDDM (17)	NIDDM (20)
Age (yrs.)	23.9 ± 10	19.4 ± 10.1	32.2 ± 4
BMI	17.0 ± 4.6	16.4 x 2.9	24.1 ± 3.5
<i>Economic Status:</i>			
Low	8	4	2
Middle	5	5	9
High	2	3	9
<i>Education:</i>			
Illiterate	4	1	1
School Education	8	11	8
Degree, Diploma	3	5	11

NIDDMs were compared with those of the FCPDs. Results are expressed as mean ± standard deviation. The statistical significance was calculated using the students 't' test.

Results

All subjects studied belonged to the state of Maharashtra and the majority of them to Pune District. The FCPDs and IDDMs belonged to younger age groups when compared with NIDDMs. The BMI of FCPDs and IDDMs was comparable, whereas NIDDMs had a higher BMI (Table 1)

The daily caloric intake of FCPDs was the least amongst the three groups (1487 ± 275 cal) in males and (1220 ± 330 cal) in females (Table 2). The caloric intake of NIDDMs was significantly higher than that of FCPDs. The daily calories/kg intake of the IDDMs was the highest (45 ± 13.7 cal in males and 62.1 ± 11.6 cal in females) (Table 3).

The total protein intake of FCPDs was again the lowest, (43 ± 10 gm/day in males and 37 ± 13 gm/day in females,) that of the IDDMs and NIDDMs which was better.

Table 2
Nutrient Intake per day.

NUTRIENT	FCPD		IDDM		NIDDM	
	M	F	M	F	M	F
Calories	1487±275	1220±330	1923±573	1654±482	2083±472**	1530 ±257
Carbohydrates(g)	232±43	192±69	302±85	255±94	302±72**	224±46
Proteins(g)	43±10	37±13	58±20	48±10	58±13**	40±10
Fats(g)	41 ±9	32 ±14	50±22	49±21	59±15*a	47±10

Values in mean ± S.D.

* p<0.05 and ** p<0.01 as compared to FCPDs

Table 3
Intake of proximate principles per kg body weight in diabetics

NUTRIENT	FCPD		IDDM		NIDDM	
	M	F	M	F	M	F
Calories	39.7±21.0	43.5±14.0	45±13.7	62.1±11.6* *	32.1±5.3	26.0±5.6*
Carbohydrates(g)	6.2±3.3	6.9±2.9	7.1±2.3	9.6±1.8*	4.8±0.9	3.8±1.0*
Proteins(g)	1.1±0.6	1.3±0.5	1.4±0.3	1.9±0.3**	0.9±0.2	0.7±0.2*\$
Fats(g)	1.1±0.6	1.1±0.3	1.1±0.4	1.7±0.4ns	0.9±0.2	0.6±0.1ns

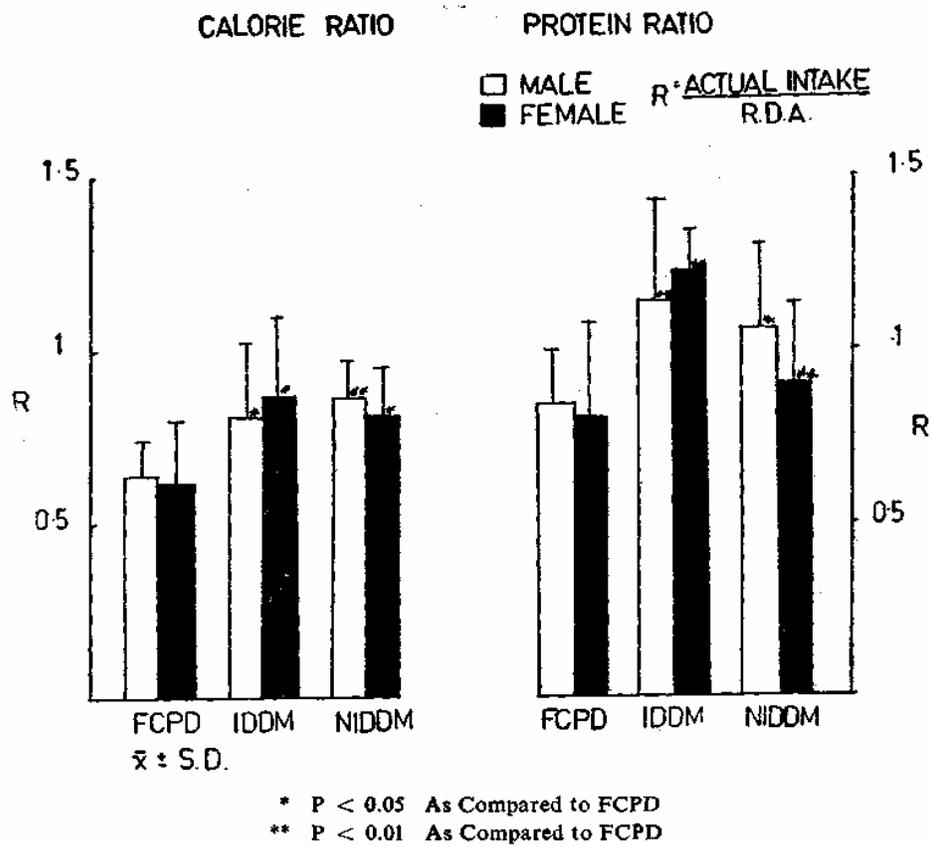
Values in mean ± S.D.

*p<0.05 and ** p<0.01 as compared to FCPDs

The carbohydrate intake of FCPDs was low compared to the IDDMs and NIDDMs. The total fat intake of the NIDDM males and females was 59 ± 15 gm and 47 ± 10 gm which was significantly higher than the FCPDs. The fats/kg intake of IDDM females was significantly higher than that of FCPDs.

To evaluate the adequacy of their calorie and protein intake the groups were compared with their respective Recommended Daily Allowance R.D. A.s (2) and the ratio of Actual/Recommended intake was calculated. (Fig,!). It was found that the ratios of both IDDMs and NIDDMs were significantly higher than that of the FCPDs for calories and proteins.

All the three groups consumed moderately high carbohydrate diets i.e. 60% to 63%.



Jawar was a common staple food amongst the FCPDs, either alone or with rice and wheat (table 4). Out of 15 FCPDs 13 consumed jawar as staple food

Table 4
Staple Foods

Staple Food	FCPD n15	IDDM n17	NIDDM u20
Jawar	3	2	—
Jawar, Wheat, Rice	4	2	2
Jawar & Rice	6	2	—
Wheat & Rice	2	11	15
Wheat	—	—	3

whereas 6 out of 17 IDDMs and 2 out of 20 NIDDMs consumed jawar as staple Cassava is not routinely available in this part of India, and none of the subjects admitted to having ever eaten cassava.

Discussion:

The present study indicates that the FCPDs consumed less calories and proteins compared to the other group of diabetics i.e. IDDMs and NIDDMs. Their intake was significantly low when compared with their respective R.D.A.s. The high calories/kg intake of IDDMs is possibly due to their younger age and presence of polyphagia. Their total caloric intake was more appropriate to their requirements. The calories/kg intake of NIDDMs was lowest as they belonged to a higher age group, were more educated and possibly aware of the need to 'diet'.

There has been considerable debate about the possible role of malnutrition in aetiology of 'tropical' varieties of diabetes. Malnutrition might be a conditioning if not the only factor responsible. Equally it is possible that presentation and course of disease in malnourished individuals is different than the standard descriptions of IDDM and NIDDM. As yet there is no good evidence that malnutrition causes permanent metabolic alterations in human beings. Disturbances of metabolism in Kwashiorkor are said to be reversible on refeeding. In this light we would stress that the smaller nutrient intake of our FCPDs may not be interpreted as a causal factor in the aetiology of diabetic state.

Malnourishment in such individuals is substantially a result of uncontrolled diabetes and exocrine pancreatic insufficiency, in addition to reduced intake. Adequate insulin treatment and nutritional therapy improves their nutritional state. Their socio-economic background possibly influences their dietary habits adversely, which would otherwise attempt to balance the energy metabolism. Influence of infections and infestations remains to be elucidated.

Jawar was the common staple food amongst the FCPDs. Consumption of cassava which has a high content of cyanide, has been associated with FCPD in the presence of malnutrition (3). Sorghum (Jawar) is also listed as a food high in 'cyanide' content. Hence it is thought to be a possible culprit in areas where cassava is not consumed. There is no hard data available, however. The FCPDs consumed jawar as one of the common staple food mainly because most of them belonged to low socio-economic groups of rural areas (Table 1), where jawar is easily grown and therefore cheaply available. We however caution

against a causal interpretation from this data. Clearly much further work needs to be done in this area.

References

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