PROFILE OF SERUM PROTEINS AND PRE-ALBUMIN IN DIABETES MELLITUS AND ITS RELATION TO VASCULAR COMPLICATIONS

M.M.S. Ahuja & Rekha Sharma

In India, staple food is cereal based and consumption of animal foods rather limited. The per capita consumption of cereal per day is 450 g, pulses 35g, milk 105 ml edible oils 17.5 g and animal products 5-8 g.

Average body mass index of a North Indian male is 22, and for females it is 25.

In view of such a background a study selected protein consumption in diet was made and it was contended to seek its effect on the nutritional status of diabetics and establish if it is related to natural history of this disease, especially in context of the vascular complications.

Material and Methods

Ambulatory diabetics attending the clinics at AIIMS were screened for this purpose. Complete history, clinical evaluation and biochemical profile was carried on each case. Recall method for 24 hour dietary intake was employed for nutritional assessment and pre-albumin values were determined by Turbidimetry method.

Results

This study includes sample of one hundred ambulatory diabetics attending the AIIMS diabetic clinic. This included 47 males and 53 females, main age was 48.7 years (11 were 25-39 years and 89 were > 40 years). The mean BMI was 25.5, 7 subjects were <19, 14 were 19-22 and 79 were > 25. Analysis of socio economic strata indicated 30 were of low strata, 60 in middle group and 10 belonged to high income group (mean income per capita was Rs. 1,015 per month).

Ten of the patients were receiving insulin, 60 were on oral hypoglycaemic agents and 30 were maintained on diet alone.

The diet analysis (24 hours) of this sample was as follows:

Total calories	1850 K. cal.
Proteins	46.8 g.
Proteins as % of total calories	10.1

Department of Endocrinology and Metabolism, All India Institute of Medical Sciences, New Delhi.

As regards quality of the proteins complete protein formed 16.9g (36%), protein limited in lysine 14.4 g (30%) and protein limited in methionine 15.5 g (34%). The dietetic difference between vegetarians and non-vegetarians was as follows:

	vegetarians (78 Patients)	non- vegetarians (22 patients)
Total calories /24 hour	1800	1900
Proteins g	45.2	48.4
% of total calories	10.0	10.1
Complete proteins g	18.0	19.7
Proteins limited in lysine g	14.1	16.1
Protein limited in methionine g	13.1	12.6

Mean blood glucose was fasting 140 mg/dl, post-prandial 197 mg/dl, mean HbA1C 9.45%.

Mean serum protein values were total 6.8 g/dl, albumin 4.2 g/dl, globulin, 2.6 g/dl. 20 healthy controls screened provided a mean pre-albumin value of 26.24%. Mean pre-albumin value of diabetics screened was 24.4 mg%. Those with a value lower than 11.0 g were considered to have significant nutritional deprivation. There were such 18 patients, wherein mean pre-albumin was 7.8 mg ±1.6 In 14 (77%) BMI was < 19. 14 of these were vegetarians and 4 were non-vegetarians.

Discussion

In India, with incumbent nutritional handicap, longevity of diabetes is 10 years compared to well nourished countries where longevity is 30 years.

Mean period for onset of complications amongst Indian diabetics is 7 years, compared to 15 years in the western countries.

There is emerging evidence that amount of proteins in diet in diabetes can influence the profile of diabetes especially nephropathy and related morbidity.

In this study, there is evidence that in the North Indian population screened, protein contribution to total caloric intake is < 10% and low pre-albumin

values were present In 18% of diabetics screened. This indicates the existence of nutritional handicap in the population. It is observed 4 times more amongst the vegetarians than non vegetarians.

None of the vegetarians analysed had cardiovascular complications. This brings forth the consideration that while protein consumption is < 10% of total calories and only 36% of this being complete proteins, vegetarianism is being followed by three fourths of the population, and such dietetic profile might bear some relationship to the natural history of diabetes in this country.

Index of nutritional handicap as assessed by pre-albumin values indicates increased susceptibility of vegetarians to such a state. This may in turn be contributing to lower prevalence of cardiovascular complications in this population. However, poor metabolic control, frequent infective complications or reduced immunological resistance overshadow this and lead to reduced longevity of diabetics in this country.