EFFECTS OF NUTRITION ON THE MANAGEMENT OF CIRRHOSIS

Pages with reference to book, From 58 To 62

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Abstract

Irrespective of socio-economic groups, thirty two cirrhotics of both sexes were followed-up to assess the effect of nutrition on their management. An average of 62gm and 54gm protein and 48gm and 40gm of fat intake was well tolerated in males and females respectively. The inclusion of fat and animal proteins helped these patients to overcome the deficiency of these nutrients. A rise of serum albumin from 2.7gm% to 3.8% and from 2.9gm% to 4.2gm% in males and females respectively is an index of improvement of hepatic function. Hemoglobin concentration of these cases also improved from 1 0.3gm% to12.9gm% (JPMA 36: 58, 1986).

INTRODUCTION

Apart from anorexia in cirrhosis of liver, imposed restriction of fats and animal proteins not only leads to deficiency of essential fatty acids, amino acids, certain vitamins and mineral but also results in diet deficient in calories.[1]

The body compensates the requirements by catabolising its own stores of protein, fat and carbohydrates which may not be metabolized adequately by the damaged livet[2-4]. Moreover, catabolism of body protein in cirrhotics liberates more ammonia than is generally produced from proteinous foods of animal origin[5]. It is therefore, likely that malnourished cirrhotics are more likely to develop portosystemic encephalopathy[6]. This study was, therefore, carried out to provide a balanced diet with adequate protein and fat to the cirrhotic patients and thereafter find the out-come.

METHODS

Thirty two patients (19 males, 13 females) with liver cirrhosis irrespective of their socio-economic status were selected from the PMRC Research Centre, Karachi. The history of their pre-existing dietary intake/week was recorded by recall method and then calculated from the table of 'nutritional value of food[7] to get the daily intake of different nutrients. Then therapeutic dietary advices were given to them according to age, sex weight and height as well as other complications and condition of hepatic disorder. They were followed up every week initially and once or twice a month thereafter depending upon theirb condition. Sixty percent of them had ascites and oedema, and 50% had jaundice. Most of them complained of bone pains, cramps, skin roughness anorexia, nausea and malaise.

RESULTS

The average intake of nutrients both prior and during the follow-up is shown in table I,

TABLE 1
Average pretreatment and during treatment nutrient intake.

Nutrients	Male		Female	
	Pre-treatment (19)	During treatment (19)	Pre-treatment (13)	During treatment (13)
Calories	1268	1850***	956	1541***
Total protein (gm)	34.6	62***	27.8	54***
Animal protein (gm)	9.8	30***	7	17*
Fat (gm)	24	48***	19	40***
Carbohydrate (gm)	227	269*	166	233**

*<.02 P value as compared to pre-treatment intake.
**<01 P value as compared to pre-treatment intake.
***<.001 P value as compared to pre-treatment intake.

II and III.

TABLE II
Average animal protein intake

Protein Intake	Male		Female	
	Pre-treatment % of the pts.	During treatment % of the patients	Pre-treatment % of the pts.	During treatment % of the patients
Nil	17	0	23	0
Less than 10gm	72	0	62	0
10-20gm	0	50	0	61
21-above gm	11	50	15	38.5

TABLE III
Average intake of protein from various sources.

Sources	Males	Females
	Mean Intake gm	Mean Intake gm
Meat	16 (90)	14 (80)
Milk	9 (76)	8.5 (90)
Legumes	11.3 (90)	15 (90)

% of patients is given in parenthesis.

Their pre-existing dietary intake was poor. Fat and proteins were grossly restricted which resulted in significantly inadequate intake of calories.

Table II shows that during treatment animal proteins were adequately consumed by both sexes. Most females received protein from legumes and males from animal source (Table III). Twenty three percent of the total calories were obtained from the dietary fat (Table I). Vitamins and minerals were also adequately consumed by these cases, (Table VI).

TABLE IV
Serum albumin stats prior and after treatment

Groups	Male				Female			
	Pre			After	Pre			After
	Mean gm.	No (%) of the patients	Mean gm.	No (%) of the patients	Mean gm.	No (%) of the patients	Mean gm.	No (%) the patients
Group I (Below 3gm/100ml)	2.5	11 (79)	3.7	11 (79)	2.3	4 (36)	3.8	4 (36)
Group II 3gm or more/100ml	3.2	3 (21)	4	3 (21)	3.3	7 (64)	4	7 (64)

Table IV and V show the clinical and laboratory data both prior and during treatment period which indicates the effects of nutrition on the management of cirrhosis. The column of weight shows no difference between prior and after treatment, (Table V).

TABLE V

Serum protein, Albumin and Hb. status prior and after treatment

	Weight (lb)		Protein (gm%)		Albumin gm %		Hb. %	
	Prior	After	Prior	After	Prior	After	Prior	After
Males	122	123	6	7.1	2.7	3.8	10.3	12.9
Females	110	113	6.8	7.2	2.9	4.2	10.3	12.5

However, the average weight shown prior treatment may not be the actual weight due to fluid retention. But after treatment the average weight includes weight after disappearance of ascites and oedema. Serum albumin level both prior and after treatment were available in 14 males and 11 females. Seventy nine percent males and 36% females had serum albumin level below 3 gm/1OOml (group 1) and 21% and 64% had 3gm/ lOOml or more respectively (group 2). After treatment both the groups showed significant increase in their serum albumin levels. No increase in serum albumin was noted in 3 males in group I (Table IV).

TABLE VI

Vitamin and mineral supplements for liver disease

Supplement	Recommended dosage	Present study
Vitamin A	2500 I.U.	2500 I.U.
Vitamin D	400 I.U.	450 I.U.
Vitamin C	100 - 500mg.	300 - 500mg.
Thiamin (B_1)	5 - 25mg.	10 - 20mg.
Riboflavin (B_2)	3 - 15mg.	4 - 10mg.
Niacinamide	20 - 50mg.	50 - 100mg.
Pantothenic Acid	10 - 20mg.	5 - 10mg.
Pyridoxine (B_6)	7.5 - 25mg.	5 - 10mg.
Zincsulfate	10 - 25mg	1.2 - 3mg.
Calcium Phosphate (with deficiency)	1 - 2g.	1g.
Magnesium sulfate (with deficiency)	.5 - 1.0g.	5 - 10mg.
Ferrous sulfate	10 - 30mg.	10 - 20mg.

Quainlan, D.P. and Leevy, C.M. 1979)

DISCUSSION

Like other well controlled studies,[8-13] this study also indicates that dietary fat was well tolerated by cirrhotic patients because the mean intake of fat was 48 and 4Ogms in males and females respectively in comparison to their preexisting fat intake of 24.7 and l9gms which were derived mostly from cereals and vegetables. All patients tolerated adequate fat intake as has also been observed by other workers[14-16]

Liberal fat intake results in a rapid improvement by providing essential fatty acids and some fat soluble

vitamins which help protein metabolism as well as increases the resistence against the disease. [17-20] Adequate animal proteins were also well tolerated by these cases (Table III). Sixty percent of the cases of both sexes could meet the RDA recommended by WHO and none of them consumed less than lOgms of animal protein, whereas before any dietary instruction 29-61% of them received none or very negligible amount of animal protein and the remaining consumed only half of the requirement of the RDA.

These patients were adviced to take liberal protein because it is e ssential for repair of hepatic cells and the formation of cholic and other bile acids[12,21] This study also shows the same benefical effect because a rise in serum albumin (Table IV) in these cases is an excellant index of improvement of hepatic function.[21-24]

High legumeous foods were given to patients who did not like meat or developed ascites. It was observed that legumeous foods like peas, beans, dried cow peas and pulses were better tolerated than meat because they contain negligible amount of sodium and large amount of Branched-Chain Amino Acids which are oxidized by the skeletal muscles.[25-30]

The inclusion of fat and animal protein not only helped these patients to overcome the deficiency of these nutrients but also increased the morale of the patients by allowing them a diet which was not veiy different than a normal diet. Moreover, addition of fat increased the palat ability of the diet which inturn increased their intake of food. With increase Carbohydrate intake the caloric intake was also significantly increased in both sexes (Table II) which is most desirable in liver cirrhosis.[12,14,19]

Vitamins and minerals also play an important role in the management of the disease. Therefore effort was made to supplement all the vitamins and minerals (Table VI) sufficiently by giving only those preparations which could provide the recommended dosage of these nutrients. It was observed that these cases were benefited by these supple mentations because they could overcome theft complications like, bone pain, cramps skin roughness as well as anorexia which are the sign and symptoms of vitamins and minerals deficiency.

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