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Perception and Knowledge About Dietary Intake in Patients with Liver Cirrhosis and its Relationship with the Level of Education

Rustam Khan, Ashfaq Ahmed, Faisal Wasim Ismail, Shahab Abid, Safia Awan, Hasnain Shah, Saeed Hamid and Wasim Jafri

ABSTRACT

Objective: To determine patients perception and knowledge regarding diet in cirrhosis and its relationship with the level of patients education.

Study Design: Cross-sectional observational study.

Place and Duration of Study: This study was conducted at Gastroenterology Outpatient Clinics at the Aga Khan University Hospital, Karachi, the Aga Khan Health Services, Malir, Karachi and Hamdard University, Karachi, from January to December 2010.

Methodology: Consecutive adult patients with compensated cirrhosis were enrolled. Demographic data, level of education, type and reason of food restriction as well as the source of dietary information was asked. Baseline laboratory test were performed, and nutritional status was assessed by BMI normogram.

Results: Ninety patients, 58% male were enrolled. Mean age of the patient was 49 ± 11 years. Overall 73% of the patients were restricting fat, meat, fish and eggs in their diet; 53% were in uneducated group and 47% were in educated group (CI, 0.24-1.62, p-0.34). Twenty two patients (62.8%) in uneducated and 21 in educated group (68%) were restricting diet on the advice of their doctors, whereas 13 in uneducated group (37%) and 11 in educated group (32%) believed these dietary components to be harmful for the liver. Thirty two of uneducated patient (71.1%) and 28 of educated patients (62.2%) believed that vegetables, fruits and sugarcane had a beneficial effect on the liver. Main source of dietary information to the patients was the doctor. On sub-group analysis those who restricted diet irrespective of their educational level, had more patients with BMI less than 18.5 kg/m², (CI 0.01-0.94, p-0.001), haemoglobin less than 12 g/dl (CI 0- 0.03, p-0.001) and serum albumin less than 3 g/dl (CI 0.1- 03, p-0.001).

Conclusion: Both educated and uneducated classes of the patients have improper knowledge and perception of diet in cirrhosis. Patients with cirrhosis who restricted diet, had relatively low BMI, haemoglobin and albumin as compared to those who did not restrict. Main source of dietary information to cirrhotic patients were health care personnels.

Key words: Diet and cirrhosis. Nutrition and cirrhosis. Dietary perception. Education and diet.

INTRODUCTION

Choice and belief in diet during illnesses play an important role in the nutritional status of the patient. Prevalence of malnutrition in decompensated cirrhosis is about 60-100%, whereas 20-30% of patients with compensated cirrhosis are also malnourished. As a consequence of malnutrition, these patients are highly vulnerable to various complications that may affect the survival in these patients.[1-4]

Cirrhosis is a hypermetabolic state and caloric requirements for these patients range between 2500 to 3000 Kcal/day. Malnutrition in cirrhosis is multi-factorial which includes decreased synthetic capacity of the liver, maldigestion, malabsorption and gastrointestinal symptoms like nausea, vomiting and early satiety etc.[5-7]

As a result, patients do not get enough calories to maintain good nutrition and health. Moreover unnecessary dietary restrictions are also imposed on these patients that also contribute in undernutrition and malnutrition in these patients.[8-10]

A survey of dietary practice from United Kingdom has shown that patients with cirrhosis were advised to take low protein diet for prolonged periods because medical practitioners thought that low protein diet might prevent hepatic encephalopathy.[11] A number of cirrhotic patients in the urban city of Pakistan avoid meat, fats, oils, salts, spices, milk, dairy products and rice in their diet was on the advice of the family physician, family members and friends.[12]

No study is available in the literature from developing world to see the knowledge and perception of diet in the patients with cirrhosis, its relationship to educational background of the patients or impact of these dietary restrictions on the nutritional status.

The aim of this study was to determine the patient's perceptions and knowledge regarding diet in cirrhosis and to find out its relationship with the level of education.

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METHODOLOGY

Consecutive educated and uneducated adult patients, with compensated cirrhosis, presented to the Gastroenterology Clinics at the Aga Khan University Hospital, Karachi, the Aga Khan Health Services at Malir, Karachi and Hamdard University, Karachi during the year 2010 were enrolled. Patients with age less than 14 years and patients with decompensated cirrhosis were excluded in order to avoid heterogeneity of the nutritional status due to disease process in different stages of cirrhosis. Patients with other co-morbid conditions requiring dietary modification and restrictions for different reasons were also excluded.

To calculate the sample size, software EPI Info version 3.5.1 CDC was used. The sample size required for the study at 5% level of significance and power of 80%, required 42 subjects from each group (Educated and Uneducated) assuming that the dietary knowledge among the educated class is 60% and uneducated class is 30% (a difference of 30%).[12] Inflating the sample size by 5% for non-responder, sample size of 45 in each group and a total sample size of 90 was calculated.

Hypothesis of the study was that educated patients had better knowledge and perception of diet in cirrhosis as compared to uneducated patients.

To classify the patients in different socioeconomic classes, Hollingshead Index (HI) of Social Position (ISP) was used. In this criterion, residence of the patient, occupation and education of the head of households is taken into account which correlates with the family social class position. On the basis of this criteria, patients were divided into upper, middle and lower socioeconomic class.[13]

To assess the educational status, patients were asked about their formal educational level. Patients with education equal or above the secondary school level were judged to be educated from the study point of view.

After taking written informed consent, demographic data, type of cirrhosis and Child Turcotte Pugh (CTP)[14] class was recorded. Patients were interviewed regarding dietary practices through an open ended questionnaire both in Urdu and English. Type of food restricted by the patient and the reason for not taking those dietary components was also asked. Finally, the sources of dietary information like patient's own choices, family members, doctors or other health care provider, traditional healer or media etc. was also asked.

Blood samples were obtained for laboratory test like complete blood count, fasting blood sugar, liver function tests, albumin and alpha-fetoprotein. Ultrasound abdomen was also done to document cirrhotic changes in the liver and to exclude the hepatocellular carcinoma and ascites.

Nutritional status of the patients was assessed by using modified body mass index normogram for Asians (BMI) i.e. BMI less than $18 \cdot 5$ kg/m^2 underweight; $18 \cdot 5$ - 23 kg/m^2 as normal, 23 - $27 \cdot 5$ kg/m^2 overweight and BMI $27 \cdot 5$ kg/m^2 or higher as obese.[15-17]

The Statistical Package for Social Science (IBM SPSS Statistics version 19) was used for data analysis. Descriptive analysis of socio-demographic variables was done and means and standard deviations (SD) was calculated for quantitative variables and proportions for categorical variables. Continuous variables were compared using Student t-test and categorical variables were compared by chi-square or Fisher exact test and 95% confidence intervals (CI) was calculated for each association. All p-values were two sided and considered as statistically significant if $p < 0.05$. This study was approved by the Hospital Ethical Review Committee (ERC) before starting.

RESULTS

Ninety consecutive patients with cirrhosis were enrolled; 45 patients each in educated and uneducated groups. Fifty two were male (58%) and 38 were female (42%). Mean age of the patients was 49 ± 11 years. Mean height of the patients was 159.09 ± 9.39 cm mean weight was 61.8 ± 11.35 kg and mean BMI was 21.4 ± 2.51 kg/m^2.

Hepatitis C was the predominant underlying cause of cirrhosis and was seen in 72 of the patients (80%). Fifty four of the patients (60%) had Child-Turcotte-Pugh (CTP) Class A and 36 had CTP Class B (40%).

Regarding socioeconomic class, 7 patients (8%) belonged to upper socioeconomic class, 48 to middle (53%) and 35 to lower socioeconomic class (39%).

Regarding occupation, 35 were housewives (39%), 24 had private service (27%), 11 were businessmen (12%), 9 were unemployed (10%), 8 were government employee (9%) and 3 were farmers (4%) (Table I).

On analyzing dietary restriction pattern, it was found that 35 of the patients (78%) in the uneducated class and 31 of patients (68%) in the educated class were restricting fats, meat, fish and eggs in their diet (CI, 0.24 - 1.62, p=0.34).

Among the patients with diet restriction, when asked about the reason for doing so, 22 in uneducated (49%) and 21 in educated group (47%) were doing it because of the advice of their doctors, whereas 13 in uneducated group (29%) and 11 in educated group (24%) believed these dietary components to be harmful for the liver. Remaining patients who did not restrict diet in both groups believe that good nutrition is beneficial and diet restriction is harmful for the patients with cirrhosis.

On response to the question which food in their opinion when taken during liver cirrhosis will be beneficial, 32 of uneducated class (71.1%) and 28 of educated patients (62.2%) believed that vegetables, fruits and sugar cane have beneficial effect on the liver disease.

Medical doctor was the main source of dietary information to the patients. In 41 doctors alone (46%) and in 35 of cases (38%) doctor along with friends, family members and patients' own choice was the source of dietary information to these patients. In 3 of the patients (3.3%) alternative treatment group were the source of dietary information to the patients.

Body mass index (BMI), haemoglobin concentration and serum albumin value were comparable amongst the uneducated and educated group except serum albumin

Table I: Demographic data of dietary perception of the patients with cirrhosis in educated and uneducated group.

Characteristics	Uneducated (n = 45)	Educated (n = 45)	p-value
Age in years with SD	50.78 ± 10.76	47.64 ± 10.44	0.16
Gender			
Male	20 (44.4)	32 (71.1)	0.01
Female	25 (55.6)	13 (28.9)	
BMI kg/m^2	23.17 ± 4.64	22.37 ± 4.05	0.26
Diagnosis			
Hepatitis B Cirrhosis	03 (6.7)	04 (8.9)	
Hepatitis C Cirrhosis	38 (84.4)	34 (75.6)	0.08
B+C Cirrhosis	04 (8.9)	04 (8.9)	
B+D Cirrhosis	00	03 (6.7)	
Child Pugh Class			
A	30 (66.7)	24 (53.3)	0.19
B	15 (33.3)	21 (46.7)	
C	–	–	–
Socioeconomic class			
Upper class	03 (6.7)	04 (8.9)	
Middle class	14 (31.1)	34 (75.6)	< 0.001
Lower class	28 (62.2)	07 (15.6)	
Occupation			
Business	02 (4.4)	09 (20)	
Housewife	25 (55.6)	10 (22.2)	
Private service	10 (22.2)	14 (31.1)	0.006
Government employee	01 (2.2)	07 (15.6)	
Unemployed	05 (11.1)	04 (8.9)	
Farmer	02 (4.4)	01 (2.2)	
Diet			
Diet restricted	35 (77.8)	31 (68.9)	0.34
Diet not restricted	10 (22.2)	14 (31.1)	

SD = Standard deviation;   BMI = Body mass index

Table II: Characteristics of the educated and uneducated patients with cirrhosis that restrict diet.

Characteristics	Uneducated (n = 35)	Educated (n = 31)	p-value	95% CI
Body Mass Index (BMI)				
< 18.5 kg/m^2	07 (22.6)	01 (2.9)	0.04	
18.5-23 kg/m^2	22 (71)	32 (91.4)		0.01-0.85
23-27.5 kg/m^2	02 (6.5)	02 (5.7)		0.008-2.51
Haemoglobin				
< 12 g/dl	33 (94.3)	28 (90.3)	0.54	0.41-0.65
> 12 g/dl	02 (5.7)	03 (9.7)		0.11-0.76
Albumin				
< 3 g/dl	32 (91.4)	18 (58.1)	0.002	0.50-0.75
> 3 g/dl	03 (8.6)	13 (41.9)		0.06-0.43

Table III: Comparison between the group who restrict diet versus those who did not restrict diet in cirrhosis.

Characteristics	Diet restricted (n = 66)	Diet not restricted (n = 24)	p-value	95% CI
Body Mass Index (BMI)				
< 18.5 kg/m^2	08 (12.1)	00		
18.5 - 23 kg/m^2	54 (81.8)	15 (62.5)	< 0.001	0-0.4
23-27.5 kg/m^2	04 (6.1)	05 (20.8)		
> 27.5 kg/m^2	00	04 (16.7)		
Haemoglobin				
< 12 g/dl	61 (92.4)	01 (4.2)	< 0.001	0- 0.03
> 12 g/dl	05 (7.6)	23 (95.8)		
Albumin				
< 3 g/dl	50 (75.8)	0	< 0.001	0.1- 03
> 3 g/dl	16 (24.2)	24 (100)		

which was found low in educated as compared to uneducated group. Other characteristics of the two groups are shown in (Table II).

On sub-group analysis of this cohort, those who restricted dietary constituents irrespective of their educational status, had statistically more patients with BMI less than 18.5 kg/m^2, (CI 0.01 - 0.94, p = 0.001), haemoglobin less than 12 g/dl (CI 0 - 0.03, p - 0.001) and serum albumin less than 3 g/dl (CI 0.1- 03, p - 0.001) as compared to those who did not restrict diet. None of the patient in diet restriction group had BMI > 27.5 kg/m^2 (Table III).

In upper middle socioeconomic class, 45 patients (81.8%) and in lower socioeconomic class 21 of the patients (60%) were restricting diet in cirrhosis and this difference was statistically significant (p=0.001, CI 0.7 - 0.93). Similarly, statistically significant number of patients in lower socioeconomic class had BMI less than 18.5 kg/m^2 (p=0.01, CI 0.04 - 0.90) but as regard the haemoglobin and albumin level, no statistically significant difference was seen between upper, middle and lower socioeconomic class.

DISCUSSION

This study was the first to enroll patients from different socioeconomic classes and educational levels to evaluate their perceptions and believes regarding diet in cirrhosis. It was found that overall 73% of the patients with compensated cirrhosis were restricting fats, meat, fish and eggs in their diet, and there was no statistical difference between educated and uneducated patients.

Earlier, a study from this region showed that in cirrhosis (both compensated and decompensated) patients were avoiding different dietary constituents (meat in 72%, fats and oils in 64%, salt in 42%, spices in 34%, milk and milk products in 28% and rice in 20% cases).[12] Since then, despite seemingly better overall awareness, and media advertisement, there is no significant improvement in patient's dietary choices. Majority of the patients were

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restricting diet on the advice of health care professionals and they were not aware of the negative impact of this restriction on the disease process.[18,19] Another reason for restricting fats, meat, fish and eggs in these patients was their belief that these dietary constituent are harmful for the liver with cirrhosis.

On the other hand 67% of the patients in this study were using vegetables, fruits and sugarcane with the conviction that it will have beneficial effect on the liver. These observations highlights that these patients with cirrhosis not only had inadequate knowledge but improper perception of the diet as well. This improper knowledge and perception of diet was similar across the board whether the patient was educated or not. Possible reason of this dietary misconception may be the lack of updated knowledge of primary care physicians about nutrition of the patients in different stages of cirrhosis and may be the influence of traditional medicines in this part of the world, where more stress is given to dietary restrictions in liver diseases.

In this study, only the patients with compensated cirrhosis were included in order to avoid the hetero-geneity of the group in different stages of disease and other confounding co-morbid medical conditions dictating the need for dietary modification were also excluded. It was observed that significant number of patients in the diet-restricted group had low BMI, haemoglobin and albumin level which were the objective measure of nutritional status. These findings were independent of educational status of the patients. As all of these patients were in compensated stage of liver cirrhosis so dietary choices rather than the stage of the disease seems to be the cause of impaired nutritional status.[1,20,21]

Many of these patients were on supportive medical treatment because of non-availability of liver transplan-tation in some parts of the world and few were on the waiting list for transplantation. In both of these situations good nutrition will help in delaying the onset of complications of cirrhosis and will also improve the survival before and after liver transplantation.[22]

Another observation in this study was that the medical doctor alone or in conjunction with the patient's own choices, advice from family members and friends were the predominant source of dietary information to the patients with cirrhosis. Alternative medicines practitio-ners contributed very little to dietary misperceptions of these patients. This appears contradictory to belief that people related to alternative medicines may play a significant role in changing the public opinions regarding diet in liver diseases. This needs further studies in subset of the patients who only choose these alternate methods of treatment due to one reason or the other.

Analysis of the patients on the basis of socioeconomic class, it was found that in upper middle socioeconomic class, more patients were restricting diet as compared to lower socioeconomic class but slightly more patients in lower socioeconomic class have BMI less than 18.5 kg/m^2 as compared to upper middle socioeconomic class. This might be due to the access to good nutrition in different socioeconomic classes.

One limitation of this study was that the questionnaire used was not pre-validated. However, it was pre-tested in 10% of the cases. Secondly, in this study there were no control subjects without disease to know the general perception of the peoples about nutrition in the liver diseases. Moreover, the number of patients in the study is small and further studies with increased number may make these issues more clear.

Patients knowledge and perceptions of diet are important factors in maintaining good nutrition in cirrhosis. As main source of dietary information in these patients are health care personnels and there is need to educate them. This can be achieved by the use of electronic and print media, continuous medical education (CME) seminars or workshops and group discussions for health care professionals. Education and knowledge regarding current nutritional guidelines and recommendations of different societies and updated evidenced based information about nutrition may bring improvement in knowledge of the health care professional that may impact the nutritional status of the patients with cirrhosis. This study provides some basic data about dietary knowledge and perception in cirrhotic patients on which other interventional studies can be based.

CONCLUSION

In Pakistan, both uneducated and educated patients with cirrhosis have improper knowledge and perception of diet. Patients with cirrhosis who restricted diet had relatively low BMI, haemoglobin and albumin as compared to those who did not restrict. Main source of dietary information in cirrhotic patients are health care personnels.

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