

## Role of Diet in Management of Different Forms of Chronic Hepatitis in Young Adolescence

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### Abstract

Introduction young adolescence liver disorder have in general mode of presentation distinct from that in adult population. Chronic hepatitis especially hepatitis C and B are the most common etiological agents of cirrhosis in Egypt The aim of work is to explore the role of diet in treatment of chronic hepatitis in young adolescence Patients and methods 110 patients with chronic hepatitis were classified into 3 groups : group I 46 patients with chronic hepatitis C, group II 37 patients with chronic hepatitis B , group III 27 patients with chronic hepatitis due to other causes rather than C or B infection. Liver biopsy is done for all patients. Anthropometric parameters and blood samples were taken before and after diet program for 6 months Results The biochemical parameters revealed a significant increase in the serum level of total protein and hemoglobin concentration, significant decrease in total and direct bilirubin alkaline phosphatase ALT, and AST. Non significant difference in weight ,height, arm and waist circumference, WHR and BMI in patient group after diet program. Conclusion these data suggest that diet can be effective in the treatment of chronic hepatitis in young adolescence.

### Introduction

Liver disorders of young adolescents have in general mode of presentations that are distinct from those in adult populations. It is due to varying etiology and natural history of liver diseases in young adolescence (Thapa,1999)<sup>1</sup>. Chronic hepatitis especially hepatitis C & B, are the most common etiological agents in cirrhosis in Egypt (El-Gohary *et al.*, 1995)<sup>2</sup>.

Chronic hepatitis are classified into chronic persistent and chronic aggressive form. The latter, with mild or strong inflammatory activity has proven valid and has been widely accepted. The long term therapy of the chronic persistent form to be confirmed histologically consists merely of a basic therapy diet, abstinence of alcohol physical rest and vitamins (Morl, 1997)<sup>3</sup>.

The most important and often neglected component of management of chronic liver diseases in young adolescents are nutritional management (Thapa, 1999)<sup>1</sup>. Dietary measures have achieved mixed results in the management of liver disorders (Messner and Brissot, 1990)<sup>4</sup>. Therefore the aim of the present study is to explore the

role of diet in treatment of chronic hepatitis in young adolescents

### Material and methods

One hundred and ten patients with chronic hepatitis were included in this study. All patients were selected from the hepatology Clinics of Al-Ahram and El-Minia University Hospitals (Central Egypt) and were within a range from 12 – 16 years mean  $\pm$  SD 13.9 $\pm$ 1.5 Ten normal subjects were matched and served as a control group. According to the results of serological markers as well as their clinical, laboratory, radiological and histopathological diagnosis, the patients were classified into three groups:

**Group-I :** Included 46 patients with chronic HCV infection or cirrhosis with ages that range from 12 – 16 years with a mean  $\pm$  SD 14.08  $\pm$ 15 They were 30 male and 16 females.

**Group-II :** Included 37 patients with chronic HBV infection or cirrhosis with age

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that range from 12 – 16 years with a mean  $\pm$  SD 13.9 $\pm$ 1.9 They were 25 males and 12 females.

**Group-III :** Included 27 patients with chronic hepatitis not related to HCV or HBV (Schistosomiasis, cytomegalovirus, and venoocclusive disease ) with ages that range from 12 – 14 years mean  $\pm$  SD 13.1 $\pm$ 0.8 They were 20 males and 7 females

### All patients were

1-History taking and clinical examination

2-Routine laboratory investigations including

- a) CBC using coulter (Model STKs)
- b) liver function tests including bilirubin (total-direct), ALT, AST, alkaline phosphatase , total protein and albumin using CIBA corning express plus
- c) prothrombin time and concentration using thromboplastin and calcium purchased from Diamed.
- d) Urine and stool analysis
- e) Hepatitis markers including HbsAg, HbsAb, HbcAB and HCV Elisa using Sorin Biomedica kits

3- *Histopathology of liver biopsy* : percutaneous liver biopsy using Menghini needle was done for all patients.

All cases received daily food allowances for 30 gram fat diet for 6 months as shown in table (1)

- **Breakfast :** Cornflakes (1cup) or rice with skimmed milk, half boiled egg (1) or jam with toast or honey ; one orange or one apple or four fresh figs.
- **Mid-morning snak :** fruit or sugar can (1 cup)
- **Lunch :** Fish or chicken or roast mutton (60 – 75 g) ; boiled potato or porsleyed potato or rice , cooked spinach or broccoli, Mixed vegetable salad; Bread ; guava or apple or Banana
- **Mid-after noon snak :** Biscuits or cake
- **Dinner (Supper) :** Mixed meat or beef Stew or Butter milk (1cup) ; boiled potatoes, boiled beans, or cabbage or mushroom or stuffed egg plant ; rice; bread; pudding or grapes or Apricots.

- **Evening Snak :** Skimmed milk (1 cup).

**Table (1) chemical composition of the diet**

Nutrient	Amount
Protein (g)	60 – 75
Fat (g)	26 – 30
Carbohydrate (K. cal)	313 – 348
Daily food allowance	
Skimmed milk (Cup)	2
Meat, Fish, Poultry (g)	100
Whole egg/week	3
Fat (g)	15 – 20
Fruit / day	3
Vegetables	As desired
Bread, Cereals	As desired
Deserts and Sweets	As desired

Anthropometric data were collected with subject dressed in light clothing. Height and weight were taken following the standard methods of WHO (Jeliffe, 1966)<sup>5</sup>. Body mass index (BMI) was calculated as body weight in kg divided by (height in meter)<sup>2</sup> . Triceps biceps and subscapular skinfold thickness were obtained by using Harpenden skinfold caliper as recommended by the standardized procedures (Jeliffe, 1966)<sup>5</sup>. Fat free mass (FFM) was obtained from the following equation of Vanitallie *et al.*, (1990)<sup>6</sup> :

FFM = Body weight – (PFDWB) X Body weight), where PFDWB is the percent of body fat from body density, water and bone mineral content which calculated from the following equation for prepubescent boys PFDWB=1.21 (triceps skin fold+ subscapular skinfold) – 0.008

(triceps skin fold + Subscapular skinfold) 2 - 1.7

### Statistical Analysis

The results were expressed as mean  $\pm$  SD and performed using student' test. The percent distribution of the studied samples were calculated in relation to the different anthropometric parameters.

### Results

The results of the present study are given in tables 2,3,4.

The results indicate that there is was a significant increase in the mean values of serum total proteins and mean value of hemoglobin concentration, significant decrease in total & direct bilirubin, alkaline phosphates, ALT and AST in all patient groups after diet program (P<0.05), but not

to the initial values of the control group. There were no significant differences in the mean values of weight, height, arm and wrist circumferences, waist-hip ratio (WHR) and body mass index (BMI) of all patient groups after diet program, and when compared with the control one. There was a significant decrease in the mean values of triceps, biceps, sub-scapular, supra iliac &

abdominal skin folds and hip & waist circumference in all-patient groups ( $P<0.01$ ), but not to the initial value of the control one. On the other hand, there was a significant increase in the mean value of lean body mass (LBM) in all patient groups after diet program ( $P<0.01$ ), but not to the initial values of the control group

**Table (2):Liver Function Tests In The Studied Patients Before And After Diet**

	Before diet			after diet		
	G1	G2	G3	G1	G2	G3
Protein g/dl	6.24±0.5	6.17±0.46	6.32±0.41	7.41±0.61 p<0.057	7.27±0.55p<0.05	7.36±0.49p<0.05
Albumin g%	3.51±0.38	3.6±0.28	3.64±0.33	3.83±0.39 p<0.05	3.91±0.47p<0.05	3.88±0.60p <0.05
Tbilirubin%	2.98±1.65	2.65±1.70	2.15±1.43	1.25±0.7 p<0.001	1.18±0.7 p<0.001	1.28±0.6 p<0.001
Dbilirubin%	0.99±0.85	1.16±0.91	0.77±0.8	0.46±0.6 p<0.001	0.59±0.53 p<0.001	0.34±0.41 p<0.001
AST(U/L)	95.65±16.6	135.5±20.4	53.15±11.7	45.5±5.19 p<0.05	58.56±7.15 p<0.03	32.52±3.5 p<0.05
ALT(U/L)	<b>88.45±14.7</b>	144.5±22.6	56.71±12.2	38.27±6.3 p<0.05	44.84±5.85 p<0.05	25.73±5.17 p<0.05
Alk.P(U/L)	<b>275.61±34</b>	242.55±25	251.5±15	110.6±8.3 p<0.05	126.6±10.3 p<0.05	119.96±7.7 p<0.05

P<0.05 significant difference

P<0.005 highly significant difference

## Discussion

The standard medical treatment of chronic hepatitis especially chronic hepatitis C infection is only associated with sustained efficacy in a minority of patients. Therefore, the search for other treatments is of utmost importance.

Milliman and his team (2000)<sup>6</sup> studied a comprehensive protocol, including diet, lifestyle, and therapeutic interventions. They performed a retrospective review of 41 consecutive hepatitis C patients, seven had a greater than 25% reduction in serum alanine aminotransferase (ALT) levels after at least one month on the protocol. For all patients reviewed, the average reduction in ALT was 35U / L. In our study the reduction in-group II was 11.37 - 10.23 U / L, in-group III 15.95 - 13.45 U / L. Our results are in agreement with the results obtained by Milliman and his team as improvement in liver functions and hemoglobin were observed

In Japan, Hayashi and his team in (1999)<sup>7</sup> performed a study on six chronic liver disease patients, 3 with cirrhosis, 1 with chronic hepatitis, 1 with hepatitis C

virus infection, and 1 with alcoholic cirrhosis. Only high carbohydrate containing foods are given. In sever jaundice (serum bilirubin over 16 mg / dl), an average intake of 30 - 40g protein daily helps in the regeneration of liver cells.

Our results agree with the findings of Konstantinides et al. (1990)<sup>8</sup> reported that Carbohydrate is necessary to provide calories and reduce the endogenous breakdown of proteins. Intra-venous glucose may be indicated in the early phase of viral hepatitis, if sever nausea and vomiting prevent the patients from taking oral feed. As soon as the patient can take oral feeds, intra-venous feeding should be stopped. Fruits, fruit juice, vegetables and vegetable juice, sugar, jaggery, honey, biscuits and toasts are given, not only to provide carbohydrates but also to supply adequate electrolytes.

Our results also agree with the laboratory investigations obtained by Wahib and his team (1998)<sup>9</sup> where they suggested that hemoglobin level and serum albumin were significantly reduced in patients with chronic hepatitis C with or without cirrhosis and these parameters

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could be improved after using a carbohydrate rich diet for three months.

Lirussi et al., (1999)<sup>10</sup> reported that statistical analysis of albumin, bilirubin, alkaline phosphatase, ALT and AST showed that the improvement in these biochemical parameters were more pronounced in high carbohydrate diet treated patients of hepatitis C virus with liver cirrhosis

Homma et al., (2000)<sup>11</sup> announced that low fat diet for three months could reduce levels of albumin, total proteins, lipoprotein and triglycerides to half the maximal level in patients with chronic hepatitis C. These results agree with our results

Our results disagree with the results of Valla et al., (1999)<sup>12</sup> who mentioned that control and treated patients with hepatitis C virus, related cirrhosis did not significantly differ with regard to the changes in serum level of albumin and bilirubin after treatment by diet containing high protein & carbohydrate with low fat (150g proteins, 580g carbohydrates and 20g fat) daily.

Acid mussel hydrolysate which is a marine product and a medical and prophylactic preparation used in Russian, containing a full set of irreplaceable amino acids, essential fatty acids, macro-and micro elements. It can be used as a food additive to improve the taste and increase the food quality, and also used as a medical preparation against viral diseases including chronic viral hepatitis (Novikova et al., 1998)<sup>13</sup>. These results are in agreement with our results

Furthermore, our results are in agreement with the study of Corrao and his team in (1995)<sup>14</sup> who demonstrated that a pattern of higher lipid but lower protein and carbohydrate intakes were significantly associated with the risk of cirrhosis in chronic HCV infection. Moreover, no dose effect relation was found between the intake of any nutrient and the risk of cirrhosis using classical methods. They also added that the anthropometric parameters are useful tools to explore the role of diet on disease risk when precise pathogenic knowledge is not available.

Available information on the involvement of anthropometric measures in

clinical conditions associated with chronic hepatitis with or without cirrhosis is very rare. but Greco and his team in (2000)<sup>15</sup> reported that, there were a positive correlation between low fat diet and body mass index of boys and girls suffering from chronic hepatitis C. The same correlation was detected with skin fold thickness. These results disagree with our findings

We found non-significant difference in body weight, height arm and wrist circumference WHR and BMI of our patients in all groups after receiving the diet program for six months. These results are in agreement with finding of Tandon and his team (2000)<sup>16</sup> who reported that body weights were closely monitored in patients with chronic hepatitis C after consumption of rice-based diet (carbohydrate rich diet) for four months. The same authors recorded that non-significant reductions in hemoglobin concentration was seen after diet consumption, and this result are disagree with our study where there was a significant increase in hemoglobin concentration in all groups of chronic hepatitis C patients.

Kleinberger and his team in (1984)<sup>17</sup> mentioned that patients with severe jaundice suffer frequently from nausea and loss of appetite and prothrombin concentration could not be improved after vitamin K<sub>1</sub> supplementation, but it increased after parental nutrition. Furthermore, serum albumin also improved after nutrition and at the same time production of urea did not increased. They concluded that parental nutrition of carbohydrate and lipid only could improve liver function and decrease the catabolic status of metabolism and help the liver to be able to regenerate its hepatocytes.

Perez and his team in (1997)<sup>18</sup> mentioned that an induction with higher doses of diet-rich selenium and zinc as over nine months are more efficient than the classic schedule and the prolongation of the induction period does provide additional advantages. Long term treatment with selenium and zinc rich diet is well tolerated in patients with chronic hepatitis virus associated liver cirrhosis and seems beneficial in reducing disease activity

especially in patients who are unsuitable for interferon therapy.

### Conclusion and Recommendations :

More studies are needed to use more diets, more plants which may be promising in treatment or even assessing the treatment of chronic viral hepatitis. Lastly, cooperation between hepatologists and dietitian is as essential part of medical treatment of chronic hepatitis of different etiology. Future development and characterization of their role in treatment of liver diseases is a good area for scientific research.

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## " دور الوجبات الغذائية فى علاج مختلف انواع الالتهاب الكبدى المزمن فى الشباب المراهقين "

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تختلف الاصابة بأمراض الكبد فى الشباب المراهقين عنها فى الكبار ويعتبر الالتهاب  
الكبدى المزمن ب ، سى من اكثر اسباب انتشار التليف الكبدى فى مصر وكان الهدف من هذا  
البحث هو اكتشاف دور الوجبات الغذائية فى علاج الالتهاب الكبدى المزمن وتمت الدراسة على  
عدد 110 مريض بالالتهاب الكبدى المزمن تم تقسيمهم الى ثلاث مجموعات :-

المجموعة الاولى 46 مريض مصابين بالالتهاب الكبدى سى والمجموعة الثانية 37  
مريض مصابين بالالتهاب الكبدى المزمن ب والمجموعة الثالثة 27 مريض مصابين بالالتهاب  
الكبدى المزمن لأسباب اخرى غير الفيروسات ب ، سى  
بعد الفحص الاكلينيكي تم اخذ عينة من الكبد لكل المرضى وكذلك تم اخذ القياسات  
الانتروبومترية وعينات الدم قبل وبعد تغذية المرضى بوجبات غذائية مناسبة لمدة 6 اشهر  
متتالية

اوضحت الدراسات الكيميائية الحيوية وجود نقص ذو دلالة احصائية مفيدة فى مستوى البروتينى  
الكلى والبيلووبين الكلى والمباشر وانزيمات الفوسفات القاعدى وانزيمات الكبد A، T , A، T  
بينما كان هناك زيادة ذات دلالة احصائية مفيدة فى مستوى الهيموجلوبين .

كذلك اوضحت النتائج عدم وجود فروق ذات دلالة احصائية فى وزن الجسم والطول ومحيط  
الذراع والمعصم ومعدل محيط الوسط مع الحوض وكذلك مؤشر الكتلة للجسم وذلك بعد استخدام  
الوجبات الغذائية لمدة ستة اشهر

وقد انتهى البحث الى ان استخدام الوجبات الغذائية مع مرضى الالتهاب الكبدى المزمن فى  
الشباب المراهقين ذا تأثير صحى فعال ومفيد .