# Weight Reduction, Physical Activity and psychotherapeutic intervention in Chronic Hepatitis C Patients: Impact on Liver Functions and Quality of Life.

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**Abstract**

The effect of significant weight loss and the role of psychotherapeutic intervention on chronic liver disease remain unclear.

The aim of this study was to investigate the effect of weight loss and psychological support on obese chronic HCV patients as regards biochemical studies and various psychological domains. Forty four obese chronic HCV patients were included in our study, and were divided into two groups. Group A (nighnteen patients) completed a 3 month diet control and exercise regimen; liver function tests, serum insulin & blood glucose levels and weekly psycho-therapeutic intervention and psychological assessment using HRQL,HAD,BIQ and SERS were performed before the start and after three months of life style intervention program. Group B (twenty five patients); control.

On completion of the intervention, 16 patients (66.7%) had achieved weight loss with a mean reduction of BMI of 5.2 ($kg/m^2$). Improvements in serum alanine aminotransferase (ALT) levels were correlated with the amount of weight loss ($p=<0.05$ (S)). Improvements in fasting serum insulin levels were also correlated with weight loss ($p=<0.05$ (S)). Quality of life, depression, anxiety, self-esteem, and satisfaction with body image was significantly improved after weight loss. In summary, we have demonstrated major improvement in the biochemical studies and psychological aspects in overweight patients with liver disease after weight loss and psycho-therapeutic intervention.

## Introduction

The prevalence of obesity and overweight has risen at an alarming rate over the past 20 years **(Mokdad, et al, 2003, Marchesini, et al, 2001)**. There is a development of significant public health concern in light of the numerous and often interconnected health consequences of these conditions, including type 2 diabetes, hypertension, dyslipidemia, and heart disease. Recently, a novel hepatic sequela of obesity has been described: nonalcholic fatty liver disease (NAFLD) **(Mulhall**, **et al, 2002, Angulo and Lindor, 2002)** which is defined as "significant lipid deposition in the hepatocytes of the liver parenchyma in a patient without a history of excessive alcohol ingestion" **(Mulhall**, **et al, 2002)**. Most individuals with NAFLD in its uncomplicated form (simple steatosis) are asymptomatic. However, a subset progresses to more severe manifestations of the NAFLD disease spectrum, including nonalcoholic steatohepatitis (NASH), fibrosis, cirrhosis, and liver failure **(Mulhall**, **et al, 2002, Angulo and Lindor, 2002, Nakao**, **et al, 2002).**

Obesity is also recognized as an independent risk factor for the progression of fibrosis in other chronic liver diseases **(Clouston and Powell, 2002).** A number of studies have now demonstrated an

association between increased BMI or visceral adiposity and hepatic steatosis and fibrosis in patients infected with hepatitis C virus (HCV) **(Adinolfi**, **et al, 2001**, **Hourigan, et al, 1999)**. In overweight patients with chronic HCV, studies recently demonstrated an association between increasing insulin levels and increasing hepatic fibrosis, suggesting that host metabolic factors also contribute to disease progression **(Hickman, et al, 2003, Raynard**, **et al, 2002).**

The role of increased BMI and steatosis as co-morbid factors in the progression of fibrosis has important therapeutic implications. Although gradual weight reduction is recommended as a first step in the management of patients with obesity related fatty liver, there is a paucity of long term outcome data on the effect of modest weight loss on liver disease or associated metabolic factors. Modest weight loss in these patients was associated with an improvement in elevated liver enzymes due to a reduction in steatosis, and in some patients, an improvement in necroinflammatory activity and fibrosis **(Hickman, et al, 2002).**

A number of studies have consistently reported impairment in health related quality of life (HRQL) in patients with chronic liver disease compared with healthy individuals **(Bonkovsky and Woolley, 1999**, **Foster, et al, 1998).** In addition, there is a dose-response relationship between BMI and the degree of HRQL impairment **(Ware, et al, 1999, Hussain, et al, 2001).** It remains unknown whether the beneficial effects of weight reduction on HRQL are observed in patients with chronic liver disease and are sustainable long term **(Fontaine and Barofsky, 2001)**.

Patients with liver cirrhosis and depression had a significantly poorer perceived quality of life and poorer adaptive coping compared with nondepressed patients. A significantly higher number of patients with depression had a viral hepatitis (B/C)-associated cirrhosis compared with patients without depression **(Singh, et al, 1997, Elizabeth, et al., 2004, Schaefer, et al., 2005).**

Implications for medical care in CHC are evident; addressing psychosocial factors may have positive results on the outcome of patients with hepatitis C by improving compliance and reducing risk behavior **(Lee, et al, 1997, Clementine, et al., 2004).** Quality of life for the obese person is diminished in countless ways. Frequently the obese person struggles with depression, hopelessness, and despair **(Hulya, et al, 1997, Kraus, et al., 2005).**

The aim of this study was to investigate the effect of lifestyle intervention involving weight loss, increased physical activity and psychological support on liver biochemistry, fasting insulin levels, and various psychological domains in overweight HCV patients.

**Patients & Methods**

Fourty four obese chronic HCV patients were seen in the liver clinic at Kasr El-Ainy Hospital between 2005 and 2006. They were invited to participate in the study. Informed consent was obtained from each patient. Criteria for entry into the study were overweight or obese (BMI $\geq$ 25 kg/m$^2$), non-HBV educated patients capable of obeying instructions, no current major psychiatric disorder (using the DSM-IV Axis I disorders–criteria, **Ventura, et al, 1998**), or current intake of psychotropic medications which might affect the body weight. All patients included in the study

were unable to afford, or non-responders to, current antiviral treatment **(Matteoni, et al, 1999)**.

**Modulation of Lifestyle**

Lifestyle intervention included a three month weight reduction period. During this period, patients were seen on a weekly basis. A thirty minutes Weekly psycho-therapeutic intervention (ventilative, supportive, educational and cognitive behavioral), weight and waist circumference measurements, exercise (walking for one hour daily) and diet were revised with each patient at each visit **Hickman, et al, (2002), Hill, et al, (1999).**

**Biochemical and metabolic studies**

After overnight fasting, 10 ml of blood were collected from anticubital vein by venipuncture at months 0, 3. Blood samples were collected in two types of clean glass test tubes. The first group of test tubes contained fluoride for enzymatic determination of fasting plasma glucose, using a SENTINEL CH. commercially available kit **(Trinder, 1969).** The second groups of test tubes were incubated at 37°c for 20 minutes then were centrifuged at 3000 rpm to separate serum. Serum samples were divided into several aliquots for measurements of insulin, ALT, total cholesterol and triacylglycerols. Serum insulin was measured by an enzyme-linked immunosorbent assay (ELISA) kit commercially available from the DRG International, Inc. USA using Mrx dynatech laboratories ELISA reader **(Delmas, 1986).** Serum ALT was measured kinetically using SENTINEL CH. commercially available kit **(IFCC, 1980).** Serum total cholesterol **(Trinder, 1969);** and triacylglycerols **(Mc Gowan, et al, 1983),** were measured enzymaticaly using SENTINEL CH. commercially available kit. HCV antibodies, HBsAg, HBc total were done for all patients at the start of the study.

**Health related quality of life (HRQL)**

HRQL was measured at 0 and 3 months using the short form 36 (SF-36) questionnaire. The SF-36 questionnaire measured eight multi-item scales called health domains **(Ware and Sherbourne, 1992)**. Two summary scores, the mental component score (MCS) and the physical component score (PCS), were calculated via a weighted combination of the eight health domains **(Clark and Fallowfield, 1986, Australian Bureau of Statistics, 1995)**.

**Hospital Anxiety and Depression Scale (HADS):**

The HADS consists of seven items for anxiety (HADS-A) and seven for depression (HADS-D). The items are scored on a four-point scale from zero (not present) to three (considerable). The item scores are added, giving sub-scale scores on the HADS-A and the HADS-D from zero to 21 **(Zigmond and Snaith, 1983, Bjelland, et al, 2001, Herrmann, 1997).**

**Body Image Questionnaire (BIQ):**

The questionnaire gives a general assessment of body image. More important than absolute score, is the relative shift in score toward an overall more positive relationship between self and body. The questionnaire consists of 12 statements. For each of the statements, the patient rates the degree to which it applies to him from 0 to 3. In general, the final score may suggest the following: 0 - 7 Great attitudes / Keep it up. 8-14 slightly dissatisfied. 15-21 moderately dissatisfied. 22-28 Very dissatisfied. 29-36 extremely dissatisfied **(Licvoli and Brannon, 1998).**

**Rosenberg's Self- esteem Scale (RSE):**
Respondents are asked to strongly agree, agree, disagree, or strongly disagree with the scale-items. The 10 items will be combined with 20 items that have been compiled and based on already existing tests and scales relating to the variable of self-esteem. These tests and scales include the Self-Esteem Rating Scale (SERS) and the Index of Self-Esteem (ISE). Subjects will be told that all items must be answered and assigning it a value of 1, 2, 3, or 4 with 1 corresponding to a response that shows the lowest self-esteem. So, a response of "SA" or "SD" will either be assigned 1 or 4; a response of "A" or "D" will be assigned either 2 or 3 **(Rosenberg, 1965)**.

**Statistical analysis**
Continuous normally distributed variables were summarized as mean ± standard deviation (SD). They were compared by paired and unpaired t-student test when appropriate. The degree of association between ordinal variables was assessed using Spearman correlation coefficient (*r*). Categorical data were compared using a $\chi^2$ test.
All analyses were carried out using SPSS software version 10.0 (SPSS Inc. Chicago, Illinois, USA). Statistical significance was taken at a level of 5%.

**Results**

**Study patients**
Ten patients out of the included cases did not complete the study. Demographic information for the 34 chronic obese HCV patients (Group A, n = 16; Group B, n =18) is summarized in table 1. Three patients (Group A, n = 1; Group B, n = 2) had type 2 diabetes according to defined criteria **(WHO, 1999)**.

**Table 1: Demographic and biochemical parameters of patients in group A and group B prior to enrollment in life style intervention program.**

| Parameter | Group A (n = 16) | Group B (n = 18) | p Value* | Reference range |
|---|---|---|---|---|
| **Age (y)** | 46.4 (2.08) | 47.4 (1.1) | >0.05 (NS) | |
| **Sex M/F** | 9/7 | 10/8 | >0.05 (NS) | |
| **Type 2 DM (n)** | 1 | 2 | >0.05 (NS) | |
| **BMI (kg/m$^2$)** | 33.8 (1.4) | 35.2 (2.2) | >0.05 (NS) | |
| **Waist (cm)** | 118.3 (13.1) | 124.2 (3.5) | >0.05 (NS) | |
| **ALT (U/l)** | 128.7 (7.6) | 120.1 (2.1) | >0.05 (NS) | <35 U/l |
| **Cholesterol (mg/dL)** | 226.5 (21.5) | 231.3 (7.3) | >0.05 (NS) | <240 mg/dL |
| **Triglyceride (mg/dL)** | 130.2 (16.4) | 137.2 (6.6) | >0.05 (NS) | <150 mg/dL |
| **Insulin (mU/l)** | 14.0 (2.6) | 15.7 (2.1) | >0.05 (NS) | <20 mU/l |
| **Glucose (mg/dL)** | 106.8 (1.4) | 108.5 (7.9) | >0.05 (NS) | <120 mg/dL |

**Table 2: Demographic and biochemical parameters of patients in group A and group B after 3 months of enrollment in life style intervention program**

| Parameter | Group A (n = 16) | Group B (n = 18) | p Value* | Reference range |
|---|---|---|---|---|
| **BMI (kg/m$^2$)** | 28.6 (0.6) | 35.0 (6.7) | <0.05 (S) | |
| **Waist (cm)** | 109.6 (2.6) | 125.1 (0.79) | <0.05 (S) | |
| **ALT (U/l)** | 88.1 (2.5) | 117.7 (15.6) | <0.05 (S) | <35 U/l |
| **Cholesterol (mg/dL)** | 193.3 (11.5) | 227.3 (9.5) | <0.05 (S) | <240 mg/dL |
| **Triglyceride (mg/dL)** | 113.7 (11.9) | 136.7 (6.1) | <0.05 (S) | <150 mg/dL |
| **Insulin (mU/l)** | 10.2 (0.75) | 15.4 (2.9) | <0.05 (S) | <20 mU/l |
| **Glucose (mg/dL)** | 94.3 (5.0) | 113.3 (4.2) | <0.05 (S) | <120 mg/dL |

**Table 3: Demographic and biochemical parameters of patients in group A before and after 3 months of enrollment in life style intervention program**

| Parameter | Before | After | p Value* | Reference range |
|---|---|---|---|---|
| **BMI (kg/m$^2$)** | 33.8 (1.4) | 28.6 (0.6) | <0.05 (S) | |
| **Waist (cm)** | 118.3 (13.1) | 109.6 (2.6) | <0.05 (S) | |
| **ALT (U/l)** | 128.7 (7.6) | 88.1 (2.5) | <0.05 (S) | <35 U/l |
| **Cholesterol (mg/dL)** | 226.5 (21.5) | 193.3 (11.5) | <0.05 (S) | <240 mg/dL |
| **Triglyceride (mg/dL)** | 130.2 (16.4) | 113.7 (11.9) | <0.05 (S) | <150 mg/dL |
| **Insulin (mU/l)** | 14.0 (2.6) | 10.2 (0.75) | <0.05 (S) | <20 mU/l |
| **Glucose (mg/dL)** | 106.8 (1.4) | 94.3 (5.0) | <0.05 (S) | <120 mg/dL |

**Table 4: Demographic and biochemical parameters of patients in group B before and after 3 months**

| Parameter | Before | After | p Value* | Reference range |
|---|---|---|---|---|
| **BMI (kg/m$^2$)** | 35.2 (2.2) | 35.0 (6.7) | >0.05 (NS) | |
| **Waist (cm)** | 124.2 (3.5) | 125.1 (0.79) | >0.05 (NS) | |
| **ALT (U/l)** | 120.1 (2.1) | 117.7 (15.6) | >0.05 (NS) | <35 U/l |
| **Cholesterol (mg/dL)** | 231.3 (7.3) | 227.3 (9.5) | >0.05 (NS) | <240 mg/dL |
| **Triglyceride (mg/dL)** | 137.2 (6.6) | 136.7 (6.1) | >0.05 (NS) | <150 mg/dL |
| **Insulin (mU/l)** | 15.7 (2.1) | 15.4 (2.9) | >0.05 (NS) | <20 mU/l |
| **Glucose (mg/dL)** | 108.5 (7.9) | 113.3 (4.2) | >0.05 (NS) | <120 mg/dL |

At the start of the present study, there was no significant difference between both groups as regards the demographic and biochemical parameters of patients.

After 3 months there was a mean decrease of BMI of 5.2 (kg/m$^2$) and a mean decrease in waist circumference of 8.7 cm in group A. In group B there was no significant difference in weight and waist change.

Serum ALT levels improved significantly with weight reduction ($p < 0.05$) in group A. There

was a mean reduction in ALT of 31.2% (p = 0.02) while group B showed no significant change.
In addition to decreasing serum ALT levels, weight reduction significantly decreased cholesterol of 14.6% (p <0.05), triacylglycerol of 12.7% (p< 0.05) and fasting insulin levels of 27.1% (<0.05) while in group B there was no significant change.

**Psychological assessment**

**Table 5: Mean scores of HRQL of patients in group A and group B before and after 3 months.**

| | **Health related quality of life (HRQL)** | | | |
|---|---|---|---|---|
| | **Group A** | | **Group B** | |
| | **PCS** | **MCS** | **PCS** | **MCS** |
| **Before** | 40.3 (4.9) | 36.1 (1.6) | 38.1 (3.1) | 35.4 (1.0) |
| **After 3 months** | 54.7 (4.5) | 51.6 (2.5) | 37.7 (2.1) | 38.7 (2.3) |
| ***P- Value** | <0.05 (S) | <0.05 (S) | >0.05 (NS) | >0.05 (NS). |

*P value of the difference before and after life style intervention in the same group

As shown in table 5 and table 5A; there was a significant difference between mean scores of PCS and MCS in group A patients before intervention and after 3 months. There was also a significant difference between mean scores of PCS and MCS in group A patients and group B patients after 3 months. There was no significant difference between mean scores of PCS and MCS in group A patients and group B patients before intervention.
There was no significant difference between mean scores of PCS and MCS in group B patients before intervention and after 3 months.

**Table 6: Mean scores of HAD Scale of patients in group A and group B before and after 3 months.**

| **Hospital Anxiety and Depression Scale(HAD)** | | | | | | |
|---|---|---|---|---|---|---|
| | **Depression** | | | **Anxiety** | | |
| | **Group A** | **Group B** | **P-Value** | **Group A** | **Group B** | **P-Value** |
| **Before** | 14.8 (0.67) | 13.6 (1.29) | >0.05 (NS) | 15.7 (1.2) | 15.1 (1.18) | >0.05 (NS) |
| **After 3 months** | 10.3 (0.5) | 14.1 (1.6) | <0.05 (S) | 10.5 (0.4) | 14.2(1.04) | <0.05 (S) |
| **P value** | <0.01 (HS) | >0.05 (NS) | | <0.01 (HS) | >0.05 (NS) | |

As shown in table 6; there was a significant difference between mean scores of depression and anxiety in group A patients before intervention and after 3 months. There was also a significant difference between mean scores of depression and anxiety in group A patients and group B patients after 3 months. There was no significant difference between mean scores of depression and anxiety in group A patients and group B patients before intervention. There was no significant difference between mean scores of depression and anxiety in group B

patients before intervention and after 3 months.

**Table 7: Mean scores of Body Image Questionnaire and Rating Scale for Self-esteem of patients in group A and group B before and after 3 months.**

| | Body Image Questionnaire(BIQ) | | | Self-esteem Rating Scale(SERS) | | |
|---|---|---|---|---|---|---|
| | **Group A** | **Group B** | **P-Value** | **Group A** | **Group B** | **P-Value** |
| **Before** | 26.3 (1.55) | 25.6 (2.0) | >0.05 (NS) | 46.9 (1.35) | 48.6 (4.9) | >0.05 (NS) |
| **After 3 months** | 18.1 (2.0) | 26.3 (0.76) | <0.05 (S) | 64.5 (0.58) | 50.3 (1.6) | <0.05 (S) |
| **P-Value** | <0.05 (S) | >0.05 (NS) | | <0.01 (HS) | >0.05 (NS) | |

As shown in table 7; there was a significant difference between mean scores of BIQ and SERS in group A patients before intervention and after 3 months. There was also a significant difference between mean scores of BIQ and SERS in group A patients and group B patients after 3 months. There was no significant difference between mean scores of BIQ and SERS in group A patients and group B patients before intervention.

There was no significant difference between mean scores of BIQ and SERS in group B patients before intervention and after 3 months.

**Table 8: Comparison between female and male patients in group A as regard Depression, Anxiety, PCS, MCS, BIQ and SERS before start of program.**

| | **Female** | **Male** | **P-value** |
|---|---|---|---|
| **Depression** | 16.2 (0.65) | 13.4 (0.62) | <0.01 (HS) |
| **Anxiety** | 16.8 (0.74) | 14.6 (1.19) | <0.05 (S) |
| **PCS** | 37.9 (0.32) | 42.7 (2.35) | <0.05 (S) |
| **MCS** | 34.6 (1.69) | 37.7 (0.36) | <0.05 (S) |
| **BIQ** | 29.2 (0.49) | 23.2 (1.17) | <0.01 (HS) |
| **SERS** | 42.3 (1.18) | 51.5 (1.15) | <0.01 (HS) |

As shown in table 8; there was a significant difference between mean scores of depression, anxiety, PCS, MCS, BIQ and SERS in female and male patients in group A patients before intervention.

**Correlative Study:**

**Table 9: Correlation coefficients of Age, BMI, Waist, PCS, MCS, BIQ, Dep., Anx. and SERS in group A patients before treatment.**

| | **Age** | **BMI** | **Waist** | **PCS** | **MCS** | **BIQ** | **Dep.** | **Anx.** | **SERS** |
|---|---|---|---|---|---|---|---|---|---|
| **Age** | ------- | 0.52 | 0.49. | 0.16. | 0.43 | 0.17 | 0.47 | 0.08 | 0.23 |
| **BMI** | | ------- | 0.89* | -0.65* | -0.72* | 0.59* | 0.82* | 0.63* | -0.61* |

* Significant correlation at the level of 0.05

As shown in table 9 our study revealed (in group A) a significant positive correlation between mean score of BMI and BIQ, HAD Depression and HAD Anxiety Scales. On the other hand there was a significant inverse correlation between mean score of BMI and SERS, PCS and MCS Scales.

PCS and MCS Scales mean score shows a significant inverse correlation ($P<0.05$) with mean scores of BIQ, HAD Depression and HAD Anxiety Scales ($r=-0.76$, $-0.69$, $-0.59$ and $-0.52$, $-0.64$, $-0.84$ respectively). There was also a significant positive correlation between mean scores of PCS and MCS Scales and SERS ($r=0.70$, $0.66$ respectively, $P<0.05$).

BIQ mean score shows a significant positive correlation with mean scores of HAD Depression and HAD Anxiety Scales ($r=0.52$ and $0.59$ respectively, $P<0.05$). There was also a significant negative correlation between BIQ mean score and SERS ($r=-0.64$, $P<0.05$).

HAD Depression and HAD Anxiety Scales mean scores shows a significant negative correlation with mean scores of SERS ($r=-0.69$ and $-0.74$ respectively, $P<0.05$).

PCS mean score shows a significant positive correlation with mean score of MCS($r=0.86$, $P<0.01$), whereas HAD Depression Scale mean score shows a significant positive correlation with mean score of HAD Anxiety Scales mean score ($r=0.84$, $P<0.01$).

There was no significant correlation between the mean age of patients and BMI, Waist Circumference, PCS, MCS Scales, HAD Depression, HAD Anxiety Scales, BIQ and SERS mean scores.

**Discussion**

Our results demonstrate that weight reduction, psychotherapeutic intervention and increased physical activity result in a sustained improvement in ALT, fasting insulin levels, HRQL, HAD, BIQ, and SERS in overweight HCV patients.

Previous studies demonstrated that weight loss reduced hepatic steatosis and fibrosis in patients with chronic HCV **(Hickman, et al, 2002).** In our study; although liver biopsies were not performed, it is likely that the improvement in ALT and fasting insulin in patients who had weight loss was accompanied by a reduction in hepatic steatosis and necroinflammatory activity. With long term weight maintenance there is likely to be an even greater resolution of hepatic fibrosis.

Overall, in our patient cohort, the decrease in ALT and insulin levels was associated with the amount of weight loss. However, an improvement in ALT and insulin levels was seen with a weight loss of as little as 4–5% body weight without necessarily normalizing BMI. These findings are in accordance with results of recent type 2 diabetes intervention studies where the average amount of weight loss was not large yet resulted in a substantial reduction in the incidence of diabetes **(Tuomilehto, et al, 2001, Pan, et al, 1997, Knowler, et al, 2002).** Waist circumference remained significantly below enrolment measurements in all patients, regardless of weight change during follow up **(Rothacker and Blackburn, 2000, Schwartz, et al, 1995).**

Our study was not designed to test the relative contribution of dietary changes,

weight loss, or increased physical activity to the improvement in liver enzymes and insulin levels, and the individual effects of these components warrant further study.

It is widely accepted that exercise has an important role in the treatment of visceral adiposity and insulin resistance. Our data further support the important role of exercise in the successful maintenance of weight loss in patients with chronic liver disease **(Rosenberg, 1965, Hoag, 1995).**

The success of weight maintenance in our study was probably due to the initial intensive programme combined with psychotherapeutic intervention and long term follow up. Increasing the length and frequency of standard dietetic intervention improves long term success **(Perri, et al, 1989).** In addition to the substantial cost of chronic liver disease to the health care system, the reduced HRQL in our patients illustrates the significant personal and social burden on those afflicted. Comorbid conditions such as obesity significantly contribute to the reduced feeling of well being in these patients, irrespective of disease severity.

Our study revealed higher levels of depression, anxiety and body image disturbance, and lower levels of QOL and self esteem at the start of study in both groups. This might reflect the degree of psychological suffering of HCV patients. These findings are correlated with those of **(Lee, et al 1997** and **Michael, 2006)** who stated that a high percentage of patients with hepatitis C showed clinically relevant scores for depression and anxiety. Also **Perry, et al, (1993)** and **Martin, et al., (2003)** found that depression, unrelated to IFN therapy, was the most common associated disorder in CHC. **Herrmann, (1997)** stated that the mean score of anxiety was higher or equal in patients with CHC compared with cancer patients.

**Foster, et al, (1998)** and **Cinda, et al., (2002**) showed that the reduction in quality of life scores in HCV patients could not be attributed to the degree of liver inflammation or the mode of acquisition of the infection; they suggested that the time of "knowledge" about hepatitis C infection seems to be one of the main variables influencing the emotional state.

The significant positive correlation between mean score of BMI and BIQ, HAD Depression and HAD Anxiety Scales; in addition to the significant negative correlation between mean score of BMI and SERS, PCS and MCS Scales might indicate that obesity represents a psychological burden to HCV patients which lead to worsening of mood states, disturb body image, lower self-esteem and also affect QOL.

Our findings are appropriate with **Blues, (2004)** who found that Obesity carries a large social stigma and may bring on depression if it negatively affects self-esteem, body image or social mobility. It may even disrupt the normal hormonal pathways. He also concluded that depression may also bring on obesity, if a person lacks the energy to exercise or is immobilized by stress.

**Hulya, et al (1997)** found that sociodemographic, psychosocial, and genetic factors may render certain obese individuals more prone to depression or vice versa. Physiological and behavioral variables that link obesity and depression have received are evident. Also **Mruk, (1996)** stated that Quality of life for the obese person is diminished in countless ways. Frequently the obese person struggles with depression, hopelessness, and despair.

**Goldsmith, et al, (1992), Cash, (1993) and Fitzgibbon, et al (1993)** found that individuals seeking treatment for weight loss have consistently demonstrated a higher prevalence of distress than their nontreatment-seeking counterparts. They also found that obese treatment seekers show elevated levels of depression, binge eating, general psychiatric symptoms, and body-image distress. **Goldsmith et al, (1992)** reported that 55.6% of their participants who were seeking weight-loss treatment met criteria for current or past psychiatric illness, especially major depression and dysthymia.

The significant improvement in mood state, satisfaction with body image, self-esteem and QOL in our HCV patients in group A; following the physical and psychological intervention might highlights the role of psychotherapeutic intervention in alleviating psychological suffering of patients. The psychotherapy sessions might have a role in improving depressive and anxiety symptoms, elevation of self-esteem, satisfaction with body and QOL through cognitive and behavioral techniques that aimed at correcting maladaptive cognitive schemata and automatic thoughts; in addition to behavioral tasks which aimed at challenging maladaptive behaviors and acquiring healthy behaviors.

Of relevance at start of our study female patients showed higher levels of depression, anxiety, dissatisfaction with their bodies, and lower self-esteem and QOL than male patients in both groups. This might be on one hand due to the higher incidence of depression and anxiety in females in general population. On the other hand these differences might be due to the higher impact of obesity and physical suffering (HCV) on females in our culture. On the other there was non significant difference between female and male patients in group A after intervention which might reflect a higher benefit of females throughout the program than males in the same group. This might be due to the higher need for support in female patients which was met with in psychotherapy sessions. These findings are correlated with **Sarwer, et al, (1998)** and **Evangelia, et al, (2006)** who found that obese women have stronger relationship between body-image dissatisfaction and depression and self-esteem.

Finally; in our study we found that the rate of drop out of HCV patients was higher in group B (7) than in group A patients (3). This might be due to the better physical and psychological care given to group A patients; also the frequent and close follow up might have a role. This finding is in agreement with **Lee, et al (1997)** who found that psychosocial factors may have positive results on the outcome of patients with hepatitis C by improving compliance and reducing risk behavior.

This study demonstrates that investment in weight reduction and psychological support has the ability to reduce risk factors associated with progression of liver disease, decrease abnormal liver enzymes, and improve quality of life. Importantly, these changes were achievable and sustainable with relatively small but persistent changes in lifestyle. These results suggest that treatment of overweight patients and psychological support should form an important component of management of those with chronic liver disease.

**Conclusions:**

HCV patients suffer a multitude of physical and emotional system.

Obesity represents a major problem to HCV

patients.

Weight reduction program and physical activity improves not only weight but also liver function.

Psychotherapeutic intervention alleviates an important part of HCV patients' suffering & improves QOL of such patients. Also it elevates self-esteem and satisfaction with body image.

**Recommendations:**

Addressing psychological care as an essential part of managing including physical activities and modulation of lifestyle is to be implemented to HCV patients.

A survey study including a larger number of HCV patients is recommended to speculate the prevalence of psychiatric disorders and psychiatric symptoms of these patients.

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**Abbreviations:** HCV, hepatitis C virus; BMI, body mass index; ALT, alanine aminotransferase; HRQL, health related quality of life; SF36, short form 36; PCS, physical component score; MCS, mental component score; HADS, Hospital Anxiety and Depression Scale; BIQ, Body Image Questionnaire; SERS Self-Esteem Rating Scale and RSE Rosenberg's Self- esteem Scale.

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## تحسن الوظائف الجسمية والنشاط البدنى والتوازن بالإضافة الى النفسى

## لمرضى إلتهاب الكبد الفيروسى "سى". التأثير على وظائع الكبد ونوعية الحياة

يعانى مرضى التهاب الكبد الفيروسى "سى" من العديد من الاعراض الجسمية مثل عيادة الوزن، اضطراب وظائف الكبد، إرتفاع نسبة الدهون فى الدم. بالاضافة الى العديد من التوابع النفسية الناتجة بهذا المرض مثل الاكتئاب، القلق، ضعف الثقة بالنفس، عدم الرضا عن شكل الجسم وتدهور فى نوعية الحياة.تهدف هذه الدراسة الى إستكشاف حجم المشاكل الجسمية والنفسية لهؤلاء المرضى والتدخل بالعلاج النفسى وانقاص الوزن وتأثير ذلك على نوعية الحياة لهؤلاء المرضى.لقد تم إختيار مجموعة من المرضى وتقسيمهم الى مجموعتين أ، ب وتم عمل تقييم نفسى لهم وكذلك بعض التحاليل. بالنسبة لمجموعة أ فقد تم عمل جلسات علاج نفسى سلوكى ومعرفى ودعمى لهم اسبوعيا لمدة ٣ شهور وفى خلال تلك الفترة تم إعداد برنامج لإنقاص الوزن لهؤلاء المرضى. فى حين ان المرضى فى المجموعة ب لم يتم عمل هذا البرنامج لهم. وقد تم عمل نفس القياسات النفسية والتحاليل لمرضى المجموعتين بعد ٣ شهور. لم نجد اى اختلافات إحصائية دالة بين المجموعتين عند بداية الدارسة. فى حين ان مرضى المجموعة أ – تحسنوا بدرجة ملحوظة بالنسبة للوظائف الجسمية وكذلك على المقاييس النفسية مثل الإكتئاب والقلق والثقة بالنفس والإقتناع بشكل الجسم وكذلك نوعية الحياة.

إن مرض إلتهاب الكبد الفيروسى "سى" يعانون من العديد من المشاكل الصحية مثل عيادة الوزن وتدهور وظائف الكبد وإرتفاع نسبة الدهون فى الدم.

- كما يعانى هؤلاء المرضى من العديد من المشاكل النفسية مثل القلق والإكتئاب وضعف الثقة بالنفس وعدم الرضا عن شكل الجسم وتدهور فى نوعية الحياة.

- وقد إستفاد هؤلاء المرضى من برنامج إنقاص الوزن وكذلك من جلسات العلاج النفسى.

- يوصى بالتدخل بالعلاج النفسى وكذلك برامج إنقاص الوزن وتغيير نمط الحياة بالنسبة لمرضى إلتهاب الكبد الفيروسى "سى".