

***Study Of Complications Of Liver Cirrhosis In Relation  
To The Nutritional Status***

Thesis

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Of internal medicine

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## ***ABSTRACT***

**Background:** Malnutrition is a salient feature in patients with hepatic dysfunction; it is also an independent risk factor for morbidity and mortality in these patients. Factors that contribute to malnutrition in patients with hepatic failure include altered metabolic rate, fat malabsorption early satiety and impaired gastric emptying, frequent hospitalizations, over dietary restriction and glucose intolerance.

**Objective:** The aim of work in this study is to assess the nutritional status among a group of Egyptian patients with Child's C liver cirrhosis and also to correlate malnutrition to various complications of liver cirrhosis.

**Methods:** This study conducted on 45 cirrhotic patients child C with or without complications .The patients were divided into two groups: group I included 30 patients with moderate to severe degree of malnutrition and group II which included 15 patients with mild degree of malnutrition.

**Results:** rate of various complications is higher in patients with severe malnutrition ,TSFT and MAC has the highest sensitivity 85.71 %,100% & specificity 90 %,60% respectively to rate of complications(p value <0.0001 & area under the ROC curve= 0.879).

**Conclusion:** it concluded that PCM is highly prevalent among patients with liver cirrhosis and it is directly related to the severity of the disease and to the rate of complications. Many tools are used to assess the nutritional status of patients with liver cirrhosis none of them is the gold standard for the nutritional assessment.

**Keywords:** Liver cirrhosis-malnutrition- complications.

# ***INDEX***

List of tables	5-6
List of figures and diagrams	7 -8
List of abbreviations	9-12
Introduction & Aim of work	13-14
Chapter one : liver cirrhosis	15 - 74
Chapter two : nutritional assessment in liver cirrhosis	75- 112
Chapter three : metabolic alterations in liver cirrhosis	113- 142
Patients and methods	143-148
Results	149-164
Discussion	165-177
Summary and conclusion	177-178
References	179-226
Arabic summary and conclusion	227

<b>Table number</b>	<b>Title</b>	<b>Page</b>
<b>1</b>	Complications of liver cirrhosis	<b>23</b>
<b>2</b>	New Diagnostic criteria of hepatorenal syndrome	<b>30</b>
<b>3</b>	Definition of hepatic encephalopathy	<b>32</b>
<b>4</b>	Proposed nomenclature for hepatic encephalopathy	<b>33</b>
<b>5</b>	Child –Turcott-Pug scoring system	<b>71</b>
<b>6</b>	Etiology of malnutrition in liver cirrhosis	<b>78</b>
<b>7</b>	Metabolic alterations in liver cirrhosis	<b>81</b>
<b>8</b>	Physical signs of nutritional deficiencies	<b>84</b>
<b>9</b>	Standard approach for nutritional management in liver cirrhosis	<b>98</b>
<b>10</b>	Estimation of dry body weight in ascetic patients	<b>99</b>
<b>11</b>	Guidelines for improving oral intake	<b>99</b>
<b>12</b>	Barriers to enteral support in hepatic failure	<b>102</b>
<b>13</b>	Fat soluble vitamin replacement in cholestasis	<b>106</b>
<b>14</b>	Recent consensus of ESPEN 20009	<b>112</b>
<b>15</b>	Data obtained from patients in Group A	<b>149</b>
<b>16</b>	Data obtained from patients in Group B	<b>150</b>
<b>17</b>	Number of patients with un explained weight loss during last six months in group A	<b>150</b>
<b>18</b>	Number of patients with un explained weight loss during last six months in group B	<b>151</b>
<b>19</b>	Number&percentage of patients who developed GIT symptoms in the last 2 weeks in group A	<b>152</b>
<b>20</b>	Number and percentage of patients who developed GIT symptoms in the last 2 weeks in group B	<b>152</b>
<b>21</b>	Comparing Group A &Group B	<b>154</b>

<b>22</b>	Correlation coefficient between different variables in group A	<b>155</b>
<b>23</b>	Correlation coefficient between different variables in group B	<b>156</b>
<b>24</b>	Incidence of complications in group A&B	<b>157</b>

## **LIST OF FIGURES AND DIAGRAMS**

<b>Figure number</b>	<b>Title</b>	<b>Page</b>
<b>1</b>	Stages of liver damage	<b>16</b>
<b>2</b>	Pathology of liver disease	<b>19</b>
<b>3</b>	Terry nails	<b>20</b>
<b>4</b>	Clubbing of fingers	<b>21</b>
<b>5</b>	Dupuytren's contracture of palmer fascia	<b>21</b>
<b>6</b>	Treatment algorithm for patients with un complicated ascites	<b>25</b>
<b>7</b>	Treatment algorithm for patients with refractory ascites	<b>26</b>
<b>8</b>	Mechanism of spontaneous bacterial peritonitis	<b>28</b>
<b>9</b>	Pathology of hepato renal syndrome	<b>30</b>
<b>10</b>	Evolution of hepatic encephalopathy	<b>36</b>
<b>11</b>	Spectrum of disordered mental state of PSE	<b>37</b>
<b>12</b>	Patho physiology of portal hypertension	<b>44</b>
<b>13</b>	Patho physiological mechanism of portal hyper tension	<b>45</b>
<b>14</b>	Management of oesophageal varices	<b>48</b>
<b>15</b>	Endoscopic vasoligation of oesophageal varices	<b>52</b>
<b>16</b>	Gastric varices	<b>53</b>
<b>17</b>	Portal hypertensive gastropathy	<b>54</b>
<b>18</b>	Guidelines for diagnosis of HCC	<b>65</b>
<b>19</b>	Staging and management of HCC	<b>66</b>
<b>20</b>	Barcelona clinic liver cancer staging classification and treatment schedule	<b>67</b>
<b>21</b>	Subjective Global Assessment	<b>87</b>
<b>22</b>	Triceps skin fold thickness measurement	<b>92</b>

## **LIST OF DIAGRAMS AND FIGURES**

<b>N</b>	<b>Title</b>	<b>Page</b>
<b>23</b>	Scheme for determination of nutritional status	<b>93</b>
<b>24</b>	Hand grip measurement	<b>95</b>
<b>25</b>	Enteral nutrition via naso-gastric tube	<b>101</b>
<b>26</b>	Insulin pathway and glucose receptors in skeletal muscles	<b>116</b>
<b>27</b>	Insulin signaling	<b>118</b>
<b>28</b>	Insulin promotes food stores	<b>119</b>
<b>29</b>	Inter relation between insulin resistance ,HCV,NAFLD and NASH	<b>121</b>
<b>30</b>	Pathogenesis of NAFLD(a,b,c,d)	<b>128-132</b>
<b>31</b>	Relation between insulin resistance and cytokines	<b>139</b>
<b>32</b>	Body fat monitor and its use	<b>147</b>
<b>33</b>	Number of weight loss in the last 6 months in Group A& Group B	<b>151</b>
<b>34</b>	GIT symptoms in the last 2 weeks in each group and their percentage in each category	<b>153</b>
<b>35</b>	Comparative results between Group A&B	<b>158</b>
<b>36</b>	Sensitivity and Specificity of BMI in relation to complications of cirrhosis	<b>159</b>
<b>37</b>	Sensitivity and Specificity of MAC to rate of complications of cirrhosis	<b>160</b>
<b>38</b>	Sensitivity and Specificity between fat% to rate of complication	<b>160</b>
<b>39</b>	Sensitivity and sspecificity of muscle % to the rate of complications	<b>161</b>
<b>40</b>	Sensitivity and Specificity of muscle %to the rate of hepatic coma	<b>161</b>
<b>41</b>	Sensitivity and Specificity of TSFT to rate of complications of cirrhosis	<b>162</b>
<b>42</b>	Sensitivity and Specificity of Visceral fat to rate of complications	<b>163</b>
<b>43</b>	ROC curve between fat % & triceps	<b>164</b>



<i>LIST OF ABBREVIATIONS</i>	
<b>Akt</b>	Activated serinethreonine-kinase
<b>ALS</b>	Acid-labile subunit
<b>ALT</b>	Alanine transaminase
<b>AST</b>	Aspartate Transaminase
<b>AVS</b>	Arterio venous shunting
<b>BA</b>	Bacterial activity
<b>BCAA</b>	Branched chain amino acids
<b>BCLC</b>	Barcelona clinic liver cancer
<b>BCM</b>	Body cell mass
<b>BIA</b>	Bioelectrical impedance analysis
<b>BMI</b>	Body mass index
<b>CEE</b>	Contrast echocardiography
<b>CLD</b>	Chronic liver disease
<b>CNNA</b>	Culture negative neutrocytic ascites
<b>CRP</b>	C - reactive protien
<b>CTP</b>	Child –Turrcotte-Pug classification
<b>DEXA</b>	Dual energy X-ray absorptiometry
<b>ER</b>	Endoplasmic reticulum
<b>ESLD</b>	End stage liver disease
<b>ESPEN</b>	European Society for Clinical Nutrition and Metabolism
<b>EVL</b>	Endoscopic vaso ligation
<b>FDA</b>	Food and Drug Administration

<b>FFA</b>	Free fatty acid
<b>FHF</b>	Fulminant hepatic failure
<b>GABA</b>	Gamma amino butyric acid
<b>GH</b>	Growth hormone
<b>GHIGF-1</b>	Growth hormone/insulin-like growth factor-1
<b>GOV</b>	Gastro esophageal varices
<b>HBE</b>	Harris Benedict equation
<b>HBV</b>	Hepatitis B Virus
<b>HCC</b>	Hepato Cellular Carcinoma
<b>HCV</b>	Hepatitis C Virus
<b>HE</b>	Hepatic encephalopathy
<b>HGO</b>	Human glucose output
<b>HIV</b>	Human Immune Deficiency Virus
<b>HNE</b>	Hydroxynonenal
<b>HOMA</b>	Homeostatic Model Assessment
<b>HPS</b>	Hepato pulmonary syndrome
<b>HRCT</b>	High resolution computed tomography
<b>HRS</b>	Hepato renal syndrome
<b>IGF-1</b>	Insulin-like growth factor-1
<b>IGFBP-3</b>	IGF-binding protein-3
<b>INF</b>	Interferon
<b>IPVD</b>	Intra pulmonary vascular vasodilation
<b>IR</b>	Insulin Resistance
<b>IRS-1</b>	Insulin Receptor Substrate 1
<b>IVNAA</b>	Deuterium oxide dilution in vivo neutron activation analysis

<b>LVLT</b>	Living donor liver transplantation
<b>MAC</b>	Mid arm circumference
<b>MAMC</b>	Mid-arm muscle circumference
<b>MDA</b>	Malondialdehyde
<b>MELD</b>	Model of end stage liver disease
<b>MI</b>	Myo inositol
<b>MRS</b>	Magnetic resonance spectroscopy
<b>mTOR</b>	mammalian target of rapamycin
<b>mTORC1</b>	mammalian target of rapamycin complex one
<b>MTP</b>	Microsomal triglyceride transfer protein
<b>NAA</b>	N –acetyl aspartate
<b>NAFLD</b>	Non Alcoholic Fatty Liver disease
<b>NASH</b>	Non Alcoholic Steato Hepatitis
<b>NCT</b>	Number connection test
<b>OLT</b>	Orthotropic liver transplantation
<b>OS</b>	Oxidative stress
<b>PCM</b>	Protein calorie malnutrition
<b>PDK1/2</b>	Phosphoinositide-dependant kinase
<b>PEG</b>	Per cutaneous endoscopic gastrostomy
<b>PELD</b>	Pediatric end stage liver disease
<b>PEM</b>	Protein energy malnutrition
<b>PH</b>	Pulmonary hypertension
<b>PHES</b>	Psychometric hepatic encephalopathy score

<b>PI3K</b>	Phosphatidyl inositol-3-kinase
<b>PN</b>	Parenteral nutrition
<b>PoH</b>	Portal hypertension
<b>PPAR</b>	Peroxisome Proliferator-Activated Receptor
<b>PPH</b>	Porto pulmonary hypertension
<b>PSHE</b>	Porto systemic hepatic encephalopathy
<b>PST</b>	Performance status test
<b>REE</b>	resting energy expenditure
<b>RFA</b>	Radio frequency ablation
<b>RHC</b>	Right sided heart catheterization
<b>SAAG</b>	Serum ascites albumin glonulin ratio
<b>SBP</b>	Spontaneous bacterial peritonitis
<b>SGA</b>	Subjective global assessment
<b>SREBP1c</b>	Sterol regulatory element binding protein 1c
<b>T2DM</b>	Type 2 Diabetes Mellitus
<b>TACE</b>	Trans arterial chemo embolization
<b>TBP</b>	Total body potassium counting
<b>Tc99-MMA</b>	Technetium macro aggregated albumin
<b>TGF-β</b>	Transforming growth factor β
<b>TIPSS</b>	Trans internal jugular portosystemic shunting
<b>TSFT</b>	Triceps skinfold thickness
<b>V/Q</b>	Ventilation perfusion
<b>VLDL</b>	Very-low-density lipoproteins

## ***INTRODUCTION AND AIM OF WORK***

### **Introduction:**

Protein-calorie malnutrition (PCM) is a common complication of liver cirrhosis, it has been found to be a risk factor for morbidity and mortality in these patients (*McCullough et al., 1997*).

The prevalence of PCM in cirrhosis is about 20% in compensated liver disease to 65%–90% in decompensated liver cirrhosis (*Caregaro et al., 1996*).

PCM has been reported in 100% in pre and post liver transplant, and malnutrition is an independent risk factor for morbidity and mortality in these patients. Frequently, patients with end stage hepatic failure will present with muscle wasting, decreased fat stores, and overt cachexia (*Moriwaki, 2002*).

Early diagnosis of malnutrition is essential to allow appropriate treatment, since malnutrition is an important predictor of complications of liver disease and mortality. Disease-specific nutritional therapy should be considered for acute liver failure, sepsis, transplantation, and encephalopathy (*Cabre et al., 1998*).

Studies showed that the severity of malnutrition is correlated with that of the liver disease and the development of serious complications such as hepatic encephalopathy, ascites, hepatorenal syndrome, post transplantation outcome, and mortality. Also, short term survival is reduced in parallel with severity of malnutrition (*Dan et al., 2008*).

### **AIM OF THE WORK:**

The aim of this work is to study the nutritional status in a group of Egyptian patients with liver cirrhosis Child C classified according to their nutritional status and to correlate the DEGREE OF MALNUTRITION TO THE RATE OF DIFFERENT COMPLICATIONS OF LIVER CIRRHOSIS.

# *Review of literature*

## *Chapter One*

### *Liver cirrhosis*

