The Correlation Between Serum Testosterone Level and Sarcopenia in Egyptian Male Patients With Liver Cirrhosis

Thesis
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بسم الله الرحمن الرحيم
(سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْحَكِيمُ)
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*"To my dear **Father** for his help and to my beloved **Mother** and my **sisters** for their care and support*

*And to my dear **husband** who was and still supporting me in all my hard times and to my beautiful daughter, **Isabel***

*To my Godfather, **Lofty** and soul of my uncle, **Essam** and all my family and friends*

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ABSTRACT

Background: Cirrhosis results from different mechanisms of liver injury that lead to necroinflammation and fibrogenesis; histologically it is characterised by diffuse nodular regeneration surrounded by dense fibrotic septa with subsequent parenchymal extinction and collapse of liver structures, together causing pronounced distortion of hepatic vascular architecture. Androgen are important anabolic hormones produced in the testes,with effects on muscle, hematopoiesis,metabolism and sexual function, low circulating testosterone levels in men are associated with anaemia, osteoporosis, the extent of androgen deficiency increase in parallel with worsening severity of liver failure, low serum testosterone has been reported in up to 90% of men with cirrhosis. Sarcopenia is defined as muscle mass two standard deviations below the young healthy adult men, although Sarcopenia associated with wit aging, it can also be present as aresult of chronic disease including cirrhosis. **Aim Of The Work**: The aim of this study is to detect the correlation between serum testosterone level and Sarcopenia in Egyptian male patients with liver cirrhosis

Patient and Methods: This study will be conducted on 40 patients with liver cirrhosis and 20 healthy subjects without evidence of any liver disease as controls. Patients and controls will be selected from inpatient and outpatient clinic of GIT Department, Ain Shams University hospital and the Hepatology Department, Al haram Specialized Hospital.

Result: In the current study,the group of cirrhotic patient reported decrease in the serum free &total testosterone than healthy controls, also this group of cirrhotic patients reported presence of Sarcopenia

Conclusion: there was adirect significant acorrelation between serum testosterone level and Sarcopenia in Egyptian male patients with liver cirrhosis

Keywords: Chronic liver diseases - hepatitis C virus - Sarcopenia - serum Testosterone

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List of Abbreviations

Abb.	Full term
AFP	*Alpha fetoprotein*
AKI	*Acute kidney injury*
ALM	*Appendicular lean mass*
APLM	*Appendicular lean mass*
BCAAs	*Branched chain amino acids*
BCLC	*Barcelona-Clinic Liver Cancer*
BMI	*Body mass index*
CDC	*Centers for Disease Control*
CLDs	*Chronic liver diseases*
CSA	*Cross-sectional area*
CSPH	*Clinically significant portal hypertension*
CT	*Computerized tomography*
CVD	*Cardio-vascular disease*
DHT	*5α-dihydrotestosterone*
DXA	*dual energy X-ray absorptiometry*
FFI	*Fried Frailty Index*
FOXO	*Forkhead box transcription factor*
GH	*Growth hormone*
GnRH	*Gonadotropin-releasing hormone*
HCC	*Hepatocellular carcinoma*
HCV	*Hepatitis C virus*
HE	*Hepatic encephalopathy*
HREs	*Hormone response elements*
HRS	*Hepatorenal syndrome*
HRT	*Hormone replacement therapy*
HVPG	*Hepatic venous pressure gradient*
IGF-1	*Insulin-like growth factor*

List of Abbreviations cont...

Abb.	Full term
IGSOP	*International Group on Sarcopenia in Older People*
MELD	*Model for End Stage Liver Disease*
MRI	*Magnetic resonance imaging*
mTOR	*Mammalian target of rapamycin*
NGF	*Nerve growth factor*
PKB	*Protein kinase B*
PMN	*Polymorphonuclear leucocytes*
PPG	*Portal pressure gradient*
RDA	*Recommended dietary allowance*
SBP	*Spontaneous Bacterial Peritonitis*
SHBG	*Sex hormone-binding globulin*
SMI	*Skeletal Muscle Index*
SPBB	*Short Physical Performance Battery*
SPSS	*Statistical Package for Social Sciences*
TRT	*Testosterone replacement therapy*
TUG	*Timed up and go test*