

# *Dedication*

*To the three pillars of my life: God and my parents. Without you, my life would fall apart.*

*I might not know where the life's road will take me, but walking with you, God, through this journey has given me strength.*

*My mother, you have given me so much, thanks for your faith in me, supporting me, and for teaching me that I should never surrender.*

*Soul of my father, you always told me; if you want to reach the stars, so do hard. Thanks for advises and God bless you.*

*I seeking to access them.....*

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## **Abstract**

Hepatocellular carcinoma (HCC) is a common complication in patients with chronic viral hepatitis and liver cirrhosis. Detection of HCC at an early stage is critical for a favorable clinical outcome. This study was aimed to determine the usefulness of Lens Culinaris Agglutinin-Reactive Fraction Alpha Fetoprotein (AFP-L3) as an early diagnostic marker for HCC in Sudanese chronic liver disease patients.

Across sectional case- control hospital based study was carried out in hepatology referral unit- Ibn Sina Hospital- Khartoum State from March 2011 to January 2012. Venous blood samples (5ml) were collected in plan container from Fifty seven patients; 25 HCC confirmed patients by standard imaging techniques and total Alpha Fetoprotein and 32 Chronic liver disease patients were enrolled in this study. AFP-L3 and Total Alpha Fetoprotein (T.AFP) were measured in serum specimens by immunometric assay.

AFP showed the highly increased levels in patients with HCC, while AFP-L3 showed decreased levels. AFP-L3 and T.AFP levels in serum significantly elevated in chronic liver disease patients and HCC patients (AFP-L3:  $P= 0.006, 0.000$  and T.AFP:  $P= 0.001, 0.000$  respectively). In addition, the serum level of AFP-L3 and T.AFP were significantly different with tumor size, number of tumors, and focal liver lesions and age. There was no significant different between male and female patients regarding AFP-L3 ( $P= 0.261$ ) and T.AFP ( $P= 0.465$ ).

AFP-L3 provides complementary information to T.AFP for an early recognition of malignant liver tumor. These finding encourage us for use the AFP-L3 as adjunct marker for diagnosis of HCC.

## مستخلص الدراسة

يعتبر سرطان الكبد من المضاعفات الشائعة لمرض التهاب الكبد الفيروسي المزمن ومرض تليف الكبد. والكشف عن سرطان الكبد في مرحلة مبكرة أمر بالغ الأهمية في معرفة نتائج سريرية ملائمة.

هذه الدراسة تهدف لتقويم ومعرفة فائدة المشتق الثالث لألفا فيتو بروتين كمؤشر تشخيصي مبكر لسرطان الكبد في الأمراض المزمنة للكبد لدى مرضي الكبد السودانيين.

شملت هذه الدراسة 57 عينة دم (5مل) سحبت من مرضي الكبد، 25 منهم يعانون من سرطان الكبد مؤكدة بالتشخيص و32 مصابون بأمراض الكبد المزمنة مثل التهاب الكبد الفيروسي (بي وسي) ومرض تليف الكبد من عيادة الكبد المحولة بمستشفى ابن سينا بولاية الخرطوم في الفترة من مارس 2011 إلى يناير 2012 وتم قياس نوعين من البروتين؛ ألفا فيتو بروتين الكامل T.AFP والنوع الثالث من مشتقاتها AFP-L3 بواسطة طرق تحليل مناعية.

بينت الدراسة بأن هنالك فروقات معنوية ذات دلالة إحصائية بين إرتفاع متوسط النوعين من البروتين في المرضي الذين يعانون من السرطان في الكبد وأمراض الكبد المزمنة (AFP-L3:  $P= 0.006, 0.000$  and T.AFP:  $P= 0.001, 0.000$  respectively)

كما لوحظ أيضاً فروقات بقياس متوسط كلا البروتين مع الخصائص المرتبطة بالمرض مثل مدة الإصابة بالمرض، حجم السرطان، عدد الأجزاء المسرطنة بالكبد وأيضاً علاقتها مع التقدم في العمر. وليس هنالك فرق معنوي بالنوع (الجنس).

وعليه فإن هذه النتيجة تتطلب استخدام المشتق الثالث من ألفا فيتو بروتين كمؤشر مساعد في التشخيص المبكر لسرطان الكبد.

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## Abbreviations

AAT	Alpha 1-antitrypsin
ACTH	Adrenal Corticotropic Hormone
AFP	Alpha- fetoprotein
Alb	Albumin
ALD	Alcoholic Liver Disease
ALF	Acute Liver Failure
ALP	Alkaline Phosphatase
ALT	Alanine amino Transferase
AST	Aspartate amino Transferase
BG	Blood Glucose
CA19-9	Cancer Antigen 19.1
CBC	Complete Blood Count
CC	Cholangiocarcinoma
CEA	Carcinoembryonic Antigen
CLD	Chronic Liver Diseases
COPD	Chronic Obstructive Pulmonary Diseases
CT	Computed Tomography
DCP	Des-gamma-carboxy prothrombin
DNA	Deoxyribonucleic Acid
ECM	Extracellular Matrix
ELISA	Enzyme-Linked Immune Sorbent Assay
ERCP	Endoscopic Retrograde Cholangiopancreatography
FNH	Focal Nodular Hyperplasia
GGT	Gamma- glutamyle Transferase

HBeAg	Hepatitis B (e) Antigen
HBsAg	Hepatitis B surface Antigen
HBV	Hepatitis B virus
HCC	Hepatocellular Carcinoma
HCG	Human Chorionic Gonadotropin
HCV	Hepatitis C virus
HRP	Horseradish Peroxidase
IBD	Inflammatory bowel disease
IGF-1	Insulin- Like Growth Factor1
INR	International Normalized Ratio
LAL	Lysosomal Acid Lipase
LCA	Lens Culinaris Agglutinin
LDH	Lactate dehydrogenase
LFT	Liver Function Test
MRCP	Magnetic Resonance Cholangiopancreatography
MRI	Magnetic Resonance Imaging
NAFLD	Nonalcoholic fatty liver disease
NASH	Non- Alcoholic Steatohepatitis
5 NTD	5Nucleotidase
PIVKA-11	Protein Induced by Vitamin K Absence
PSA	Prostatic Specific Antigen
PSC	Primary Sclerosing Cholangitis
PT	Prothrombin Time
PTC	Percutaneous Transhepatic Cholangiogram
PTT	Partial Thromboplastin Time
RB	Retinoblastoma
RNA	Ribonucleic Acid

TGF-B1	Transforming Growth Factor, beta1
US	Ultrasounds
WHO	World Health Organization