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شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



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Spot on Aldolase Enzyme as Liver Function and Evaluation of Its Value in Diagnosis and Prognosis in Liver Disease

THESIS

Submitted for Partial Fulfillment of Master Degree in
(Chemical Pathology)

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محضر

اجتماع لجنة الحكم على الرسالة المقدمة من
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بعد فحص الرسالة بواسطة كل عضو منفردا وكتابة تقارير منفردة لكل منهم لانتعادت اللجنة مجتمعة في
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المتحدث الداخلي

المقرر المتحدث

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(مهام)

Abstract

The liver is multifunctional organ that is involved in a number of excretory, synthetic and metabolic functions.

Serum liver enzyme tests usually indicate the type of liver injury. In practice, the serum aminotransferases and biliary tract enzymes, i.e., alkaline phosphatase, nucleotidase, and γ -glutamyl transferase are the most useful tests as they allow differentiation of hepatocellular disease from cholestatic disease.

The aim of this study was to evaluate the usefulness of aldolase as a biochemical marker of liver disease considering its diagnostic and prognostic value.

This study was conducted on 38 subjects whose age ranged between 23-70 years from both sexes. They were divided as follows:

- *The control group:* Ten normal subjects with no liver diseases, no ischaemic heart diseases, no muscular diseases.
- *The hepatic patients:*
 - ★ *Group 1:* Ten acute viral hepatitis cases.
 - ★ *Group 2:* Eighteen chronic viral hepatitis cases (3 cases were excluded from this group as they had ischaemic heart disease which caused marked elevation of aldolase).

Our results showed the following:

- Serum aldolase levels were significantly higher in patients with acute hepatitis than those of the controls, even though such a significant difference between the chronic group versus the control group could not be detected.
- Patients with chronic hepatitis had normal or only marginally raised serum aldolase level.
- Positive correlation was found between serum aldolase and serum transaminases.
- In acute hepatitis, the sensitivity of aldolase was 100%. This permits aldolase to be a reliable screening test in acute hepatitis.
- Aldolase specificity was 60%. In comparison to ALT whose specificity was 80%; aldolase cannot be used as a diagnostic test in acute hepatitis.
- Measurement of aldolase isoenzymes can raise its specificity and diagnostic value in liver disease because aldolase B is liver specific. Yet, the double-antibody immunoradiometric assay procedure used for determination of aldolase isoenzymes is tedious, hazardous and time consuming.
- It is recommended that a new easy reliable and uncomplicated method for measurement of aldolase isoenzymes should be accomplished. This can add another value to aldolase as a diagnostic test beside its value as a sensitive screening test.

Key word:

**Liver
Liver Function Tests
Aldolase**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا
مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ﴾

صدق الله العظيم

(سورة البقرة - الآية ٣٢)

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List of Abbreviations

ADP	: Adenosine diphosphate
ALB	: Albumin
ALD	: Aldolase
ALP	: Alkaline phosphatase
ALT	: Alanine transaminase
AMA	: Anti-mitochondrial antibodies
AMP	: Adenosine monophosphate
ANA	: Anti-nuclear antibody
ANCA	: Anti-neutrophil cytoplasmic antibodies
anti-ASGPR	: Anti-asialoglycoprotein receptor antibody
AST	: Aspartate transaminase
ASTHMA	: Anti-smooth muscle antibody
ATP	: Adenosine triphosphate
BCG	: Bromocresol green
BCP	: Bromocresol purple
CCH	: Chronic cryptogenic hepatitis
CMV	: Cytomegalovirus
CSF	: Cerebrospinal fluid
CT	: Computerized tomography
DAP	: Dihydroxyacetone phosphate
DNA	: Deoxyribonucleic acid
DNPH	: Dinitrophenylhydrazine
EBV	: Epstein-Barr virus
EID	: Electroimmunodiffusion
ELISA	: Enzyme-linked immunosorbent assay
FDP	: Fructose-1,6-diphosphate
F1P	: Fructose-1-phosphate
G6P	: Glucose-6-phosphate
GAP	: Glyceraldehyde-3-phosphate

GDH	: Glycerophosphate dehydrogenase
GGPNA	: γ -glutamyl-P-nitroanilide
GGT	: γ -glutamyl transferase
HAV	: Hepatitis A virus
HBcAg	: Hepatitis B core antigen
HBIG	: Hepatitis B immune globulin
HBsAg	: Hepatitis B surface antigen
HBV	: Hepatitis B virus
HCC	: Hepatocellular carcinoma
HCL	: Hydrochloric acid
HCV	: Hepatitis C virus
HDV	: Hepatitis D virus
HEV	: Hepatitis E virus
HFI	: Hereditary fructose intolerance
HGV	: Hepatitis G virus
HIV	: Human immunodeficiency virus
HLA	: Human leucocytic antigen
HPLC	: High-performance liquid chromatography
HSV	: Herpes simplex virus
Ig	: Immunoglobulin
IMP	: Inosine monophosphate
LD	: Lactate dehydrogenase
LKM ₁	: Anti-liver kidney microsomal antibody type 1
MD	: Malate dehydrogenase
NAD	: Nicotinic acid dehydrogenase
NADH	: Reduced nicotinic acid dehydrogenase
NADP	: Nicotinic acid dehydrogenase phosphate
NTP	: 5 nucleotidase
P5'P	: Pyridoxamine 5'-phosphate
PT	: Prothrombin time
PCR	: Polymerase chain reaction

pNP	: Paranitrophenol
pNPP	: Paranitrophenyl phosphate
RIA	: Radioimmunoassay
RIBA	: Recombinant immunoblot assay
RID	: Radial immunodiffusion
RNA	: Ribonucleic acid
TIM	: Triose phosphate isomerase
UV	: Ultraviolet