The Role of Serum Ornithine Carbamoyl-transferase And Ammonia in Both Cirrhotic Patients with And without Hepatic Encephalopathy

Thesis

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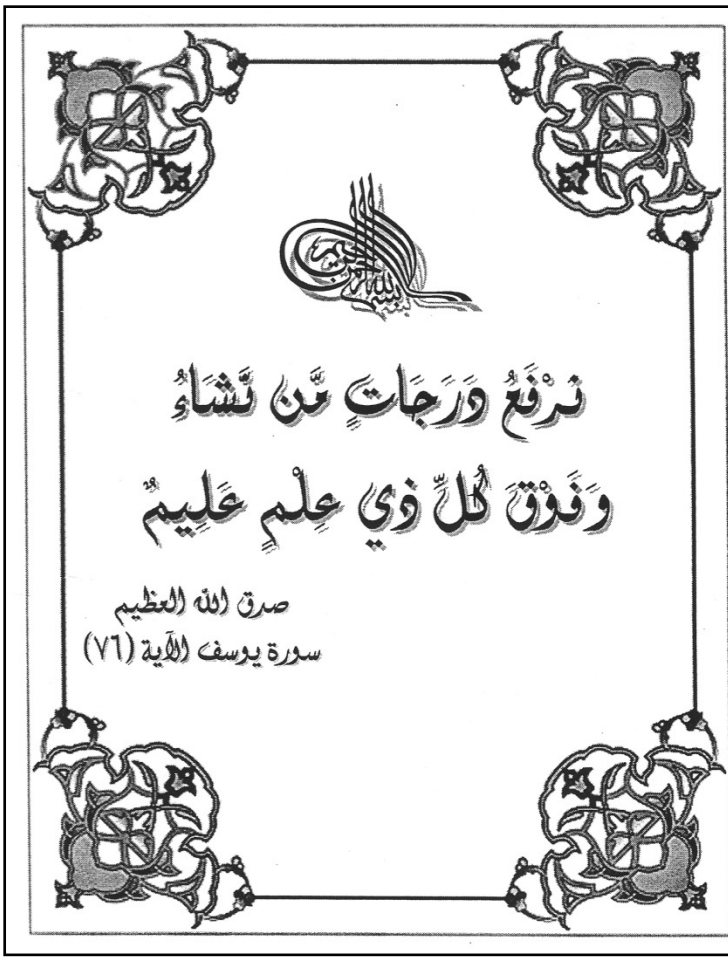

نَرْفَعُ دَرَجَاتٍ مَّن نَّشَاءُ
وَفَوْقَ كُلِّ ذِي عِلْمٍ عَلِيمٌ

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LIST OF ABBREVIATIONS

AAT	Alanine Aminotransferase
ACGH	Array Comparative Genomic Hybridization
ADHD	Attention Deficit Hyperactivity Disorder
ALC	Acetyl-L-Carnitine
ALD	Argininosuccinate Lyase Deficiency
ALF	Acute Liver Failure
ALP	Alkaline Phosphatase
ALT	Alanine Aminotranseferase
AN	Autonomic Neuropathy
ASD	Argininosuccinate Synthetase Deficiency
AST	Aspartate Aminotranseferase
BBB	Blood Brain Barrier
BCAA	Branched Chain Amino Acids
BUN	Blood Urea Nitrogen
CBC	Complete Blood Count
CH	Chronic Hepatitis
CHF	Congestive Heart Failure
CIT	Citrulline
CP	Carbamoyl Phosphate
CSF	Cerebrospinal Fluid
CT	Compeuterized Tomography
CTP	Child-Turcotte-Pugh
D.BIL.	Direct Bilirubin
EEG	Electroencephalography
GABA	Gamma Amino Buteric Acid
GDH	Glutamate Dehydrogenase
GGT	Gamma Glutamyl Transferase.
GIT	Gastrointestinal Tract
GLN	Glutamine
GRC	Gaba Receptor Complex
GRC	Gaba Receptor Complex
GS	Glutamine Synthase
H.PYLORI	Helicobacter Pylori
HB	Hemoglobin
HCC	Hepatocellular Carcinoma
HCT	Hematocrit

HE	Hepatic Encephalopathy
HRQOL	Health-Related Quality Of Life
ICP	Intra Cranial Pressure
IEM	Inborn Errors Of Metabolism.
IHA	Idiopathic Hyperammonemia
INR	International Normalized Ratio
IV	Intravenous
L.L	Lower Limb
M	Mean
MARS	Molecular Adsorbents Recirculating System
MHE	Minimal Hepatic Encephalopathy
MRI	Magnetic Resonance Imaging
MRS	Magnetic Resonance Spectroscopy
N	Number
NADS	Non-Absorbable Disaccharides
NH_3	Ammonia
NH_4^+	Ammonium
NS	Non Significant
NSAID	Non-Steroidal Anti-Inflammatory Drugs
ORN	Ornithine
OTC	Ornithine Carbamoyle Transferase = Ornithine Transcarbamoylase
OTCD	Ornithine Carbamoyle Transferase Deficiency
PBC	Primary Biliary Cirrhosis
PCS	Porto-Caval Shunts
PCS	Portacaval Shunt
PET	Positron Emission Tomography
PHES	Psychometric Hepatic Encephalopathy Score
P.HTN	Portal hypertension
P_I	Phosphate
PLT	Platelets
PNH3	Partial Pressure Of Ammonia
PSE	Portal-Systemic Encephalopathy
PT	Prothrombine Time
PTT	Partial Thromboplastin Time
PVT	Portal Vein Thrombosis
RAAS	Renin-Angiotensin-Aldosterone-System
RDCRN	Rare Disease Clinical Research Network

SBP	Spontaneous Bacterial Peritonitis
SD	Standard Deviation
SIRS	Systemic Inflammatory Response Syndrome
SPECT	Single Photon Emission Computed Tomography
TAA	Thioacetamide
TH	Therapeutic Hypothermia
TIPSS	Trans-Jugular Intrahepatic Porto-Systemic Shunt
TPN	Total Parenteral Nutrition
U/S	Ultrasound
UCDC	Urea Cycle Disorders Consortium
UCDS	Urea Cycle Disorders
US	United States

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INRTODUCTION

Hepatic encephalopathy (HE) may be defined as a disturbance of the central nervous system (CNS) function secondary to porto –systemic shunting . It represents a wide spectrum of neuropsychiatric abnormalities seen in patients with liver dysfunction after exclusion of other known neurological diseases***. (Ayman , 2010).***

The main consequence of decreased liver function is failure of ammonia detoxification. Hyperammonemia seems to be the chief culprit in patients with HE. Ammonia can affect central nervous system function directly as neurotoxic agent and indirectly due to several mechanisms **. *(Nikolaos ,et al.,2010).***

Astrocytes are the only cells in the brain that can metabolize ammonia.The enzyme glutamine synthetase (present in the endoplasmic reticulum of astrocytes) is responsible for the conversion of equimolar concentrations of glutamate and ammonia to glutamine. ***(Olde ,et al.,2009).***

Intracellular levels of glutamine, therefore, increase enormously as the ambient ammonia concentrations rise owing to liver failure, as glutamine is an osmolyte, water moves inside the astrocyte causing it to swell. This swelling leads to cerebral edema and intracranial hypertension***.(Haussinger ,et al.,2000)***

Ornithine carbamoyltransferase is expressed almost exclusively in hepatocellular mitochondria and regarded as a liver-specific marker.The serum level of this enzyme was shown to be increased in patients with hepatic disorders including hepatitis, cirrhosis and cancer**. *(Hiroshi ,et al.,2006).***