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EFFECT OF REPEATED HEAMODIALYSIS ON CREATINE
KINASE - MB ISOENZYME IN SERUM
OF URAEMIC PATIENTS

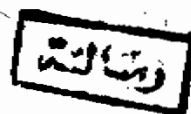
THESIS

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BY

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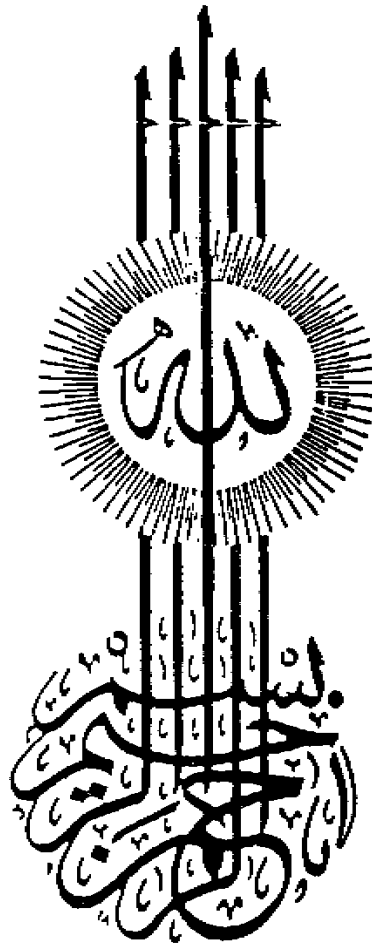
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سبحانك

لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

صدق الله العظيم



2

TO MY FAMILY

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Introduction

I- GENERAL INTRODUCTION AND

AIM OF THE WORK

A number of human enzymes occur in different body tissues as distinct isomeric species . Three isoenzymes of creatine kinase (CK) have been identified : CK -I (BB,brain type), CK-II (MB, intermediate type) and CK-III (MM,muscle type). The CK - MM isoenzyme is detectable in serum and reflects normal skeletal muscle metabolism in which creatine is converted to creatinine . In contrast CK - BB is not normally present in serum (Van Der Veen and Willibrands , 1966) !.

Elevated levels of CK are well demonstrated in neuromuscular disorders (Somer ,etal., 1976), hypothyroidism (Rao and Frame, 1978), hypoparathyroidism (Wolf, 1973) as well as in CSF of some psychotic patients (Vele, etal., 1974) .The importance of separating CK-isoenzymes in diagnosis of muscle disorders (Somer, etal., 1976) and in myocardial infarction is well established (Bleifeld ,etal., 1977) .

Elevation of serum CK-MB isoenzyme activity is believed to be highly specific for the diagnosis of myocardial infarction (Smith,etal., 1976 and Roberts and Sobel, 1978) . There are however reports of increased

serum CK-MB activity noted with muscular dystrophy (Silverman ,etal., 1976), myositis (Brownlow and Elevitch , 1974) , hypothyroidism (Goldman,etal., 1977), hypothermia (Carlson,etal., 1978), cardiac arrhythmia (Mercer and Varat, 1975) , following minor iatrogenic cardiac trauma (Tonkin, etal., 1975) , after subarachnoid haemorrhage (Fabinyi , etal., 1977) and with pericarditis (Horowitz, etal.,1974):

A high incidence of arteriosclerotic cardiovascular complication has been reported in patients undergoing long-term maintenance haemodialysis (Linder ,etal., 1974) . On the otherhand , some investigators showed increased CK-MB isoenzyme activity in serum of uraemic patients who are undergoing maintenance dialysis and who had no evidence of acute myocardial infarction at the time their sera were studied (Cohen , etal., 1980 and Martinez-Vea , etal., 1982) . They stated that increased proportions of CK - MB isoenzyme may not indicate cardiac disease , thereby decreasing the reliability of this laboratory test in this group of patients known to be particularly at risk for coronary heart disease .

The aim of this work is to determine the levels of CK-MB activity in our longterm haemodialysis population and in uraemic patients not undergoing haemodialysis

in order to evaluate the diagnostic value of this isoenzyme in these groups of patients .

Review of Literature

II- REVIEW OF LITERATURE

A- URAEMLA AND HAEMODIALYSIS

1 - Uraemia :-

a - Definition, aetiology and pathogenesis :

Uraemia is a syndrome which develops as a consequence of a significant reduction in renal function and is due to resultant impairment of renal excretory , metabolic , endocrinal and haemostatic functions . The syndrome consists of anaemia , osteodystrophy , neuropathy , acidosis and is frequently accompanied by hypertension and subsequently generalized deterioration in organ function .

Chronic renal failure may be caused by any condition which destroys the renal architecture . Conditions leading to end stage renal failure include : congenital disease as polycystic kidney , glomerulonephritis , hypertension , infections , urinary tract obstruction , systemic diseases (as diabetes mellitus) and drug sensitivities .

The pathogenesis of uraemia may be due to accumulation of toxins with many other substances in abnormal concentrations . The suggested toxins are water , electrolytes (as sodium , potassium and hydrogen) , phosphates ,

parathyroid hormone, renin, urea, creatinine, phenols and indols .

The identification of toxins, although is difficult, is important as it may lead to development of more selective dialysers designed to remove the toxic materials (Bricker, 1972) .

b - Clinical picture :

Many patients remain asymptomatic until severe renal impairment occurs i.e. creatinine clearance is less than 10 ml/min . The main symptoms are general weakness, anorexia, nausea, headache, pallor and loss of libido . The symptoms are non specific and mainly due to complications rather than the renal tract affection and thus may be misinterpreted . The main clinical features of uraemic syndrome include :

i. Anaemia :

Anaemia is a common feature associating uraemia especially when serum creatinine concentration exceeds 3.5 mg/dl (Orringer and Mattern, 1986) .

The haemoglobin concentration of most patients with blood urea nitrogen (BUN) over 100mg/dl, ranges between 3.4 and 9.5 mg/dl . Other factors may affect the