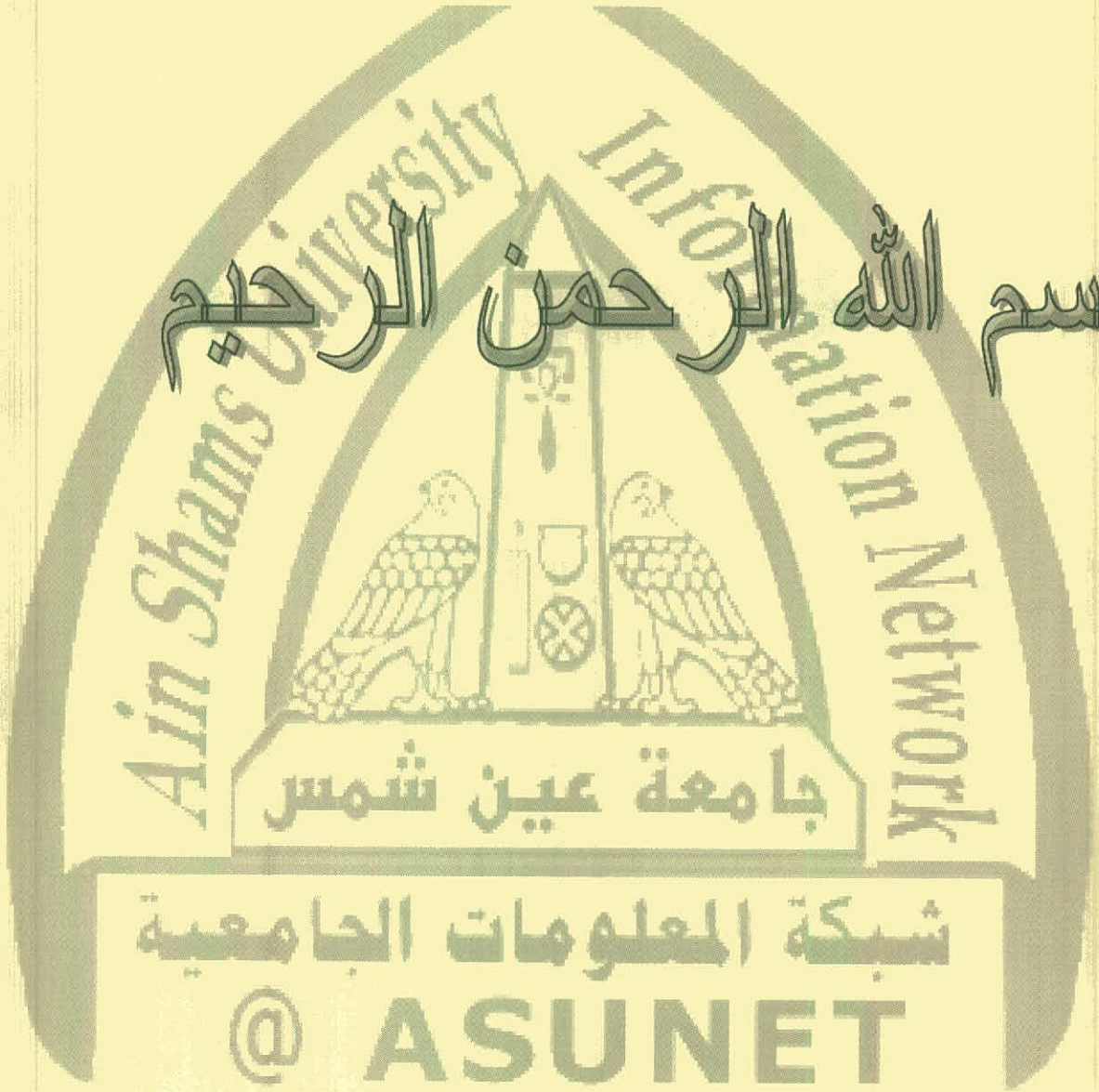
شبكة المعلومات الجامعية



بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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بالرسالة صفحات لم ترد بالاصل

IRON METABOLISM IN CHRONIC HEART FAILURE

Thesis

Submitted for the Partial Fulfillment of Master Degree in Cardiovascular Medicine

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2011

بسم الله الرحمن الرحيم

(قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ)

صدق الله العظيم

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Mergani Abdul Gader

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IRON METABOLISM IN CHRONIC HEART FAILURE

Background: Anemia is associated with increased morbidity and mortality in heart failure and is often due to abnormal iron metabolism. The aim of this study is to examine the relation between iron status and patients with chronic heart failure (reduced vs. preserved systolic function), etiology, age, gender, functional class and cachexia.

Methods: We examined 50 patients mean age 55±14 years, 78% male. Full history taking and complete clinical examination as well as ECG, echocardiographic and laboratory data {hemoglobin(Hb), serum iron, transferrin saturation, total iron binding capacity(TIBC), serum ferritin and serum transfrrin} were collected. Anemia was defined as Hb less than 13 g/dl in males and 12 g/dl in females (WHO criteria) and iron deficiency was defined by presence of low serum iron, high TIBC and low transferrin saturation.

Results: 62% of patients were anemic, 60% in class (III and IV) dyspnea, 74% reduced LVEF(EF<50%) and 64% had iron deficiency. Iron deficiency was more prevalent in females, functional class III and IV, patients with low EF and old patients(>65 years). The prevalence of iron deficiency in anemic group and non anemic group were 77% and 47% respectively (p =0.108).

Conclusions: Iron metabolism appears to be impaired in CHF patients, irrespective of presence of anemia. The higher incidence of iron deficiency among patients with more deteriorated heart function is consistent with the view that iron deficiency is a marker of a more severe disease. Thus determination of the iron status in all CHF patients could justify those at risk of developing iron deficiency anemia and more severe disease.

Key words : Anemia, iron metabolism, heart failure.

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List of abbreviations

ACC/AHA	American college of cardiology/American heart association
ACS	Acute coronary syndrome
ACE	Angiotensin converting enzyme
AMI	Acute myocardial infarction
AO	Aorta
AV	Atrioventricular
BMI	Body mass index
Bpm	beat per minute
BSA	Body surface area
CAD	Coronary artery disease
CHF	Chronic heart failure
DCT1	Divalent cation transporter
DCM	Dilated cardiomyopathy
DM	Diabetes mellitus
DMT1	Divalent metal transporter 1
ECG	Electrocardiogram
FS	Fractional shortening
FC	Functional class
GFR	Glomerular filtration rate
HIF-1	Hypoxia inducible factor-1
HTN	Hypertension
HR	Heart rate
ID	Iron deficiency
JVP	Jugular venous pressure
LA	Left atrium
LAD	Left anterior descending artery
LBBB	Left bundle branch block
LDL	Low density lipoprotein
LL EDEMA	Lower limb edema
LV	Left ventricle
LVEDD	Left ventricular end diastolic diameter
LVESD	Left ventricular end systolic diameter
MCH	Mean corpuscular hemoglobin
MCV	Mean corpuscular volume
mv	Millivolts
NSTEMI	Non-ST-segment elevation myocardial Infarction

Introduction

And Aim of the work

Introduction

Iron is a metabolically active micronutrient. One of its crucial properties is the ability to shuttle between two oxidative states (ferric and ferrous iron), which makes it an efficient cofactor for several enzymes and the catalyst of numerous biochemical reactions[1,2]. Iron plays a crucial role in oxygen transport (as a component of haemoglobin), oxygen storage (as a component of myoglobin), oxidative metabolism in the skeletal and heart muscle (as a component of oxidative enzymes and respiratory chain proteins)[3], and also is involved in the synthesis and degradation of lipids, carbohydrates, DNA, and RNA[1,2]. The maintenance of normal iron metabolism is particularly important for cells that are characterized by high mitogenic potential (neoplastic cells, haematopoietic cells, including immune competent cells) and high energy demand (hepatocytes, adipocytes, renal cells, immune cells, skeletal myocytes, and cardiomyocytes)[1,2].

Iron deficiency (ID) is the most common nutritional disorder, affecting more than one-third of the general population[4]. Iron deficiency has been also recognized to complicate chronic diseases (e.g. inflammatory bowel disease, Parkinson's diseases, rheumatoid diseases, and chronic renal failure), with or without concomitant anaemia[5]. The presence of ID may have multifaceted clinical consequences, not only directly related to impaired erythropoiesis, but also to marked impairment of oxidative metabolism, cellular energetics, and cellular immune mechanisms[1,2,3]. Iron deficiency with and without anaemia is accompanied by reduced aerobic