High Sensitivity C-reactive Protein as a Predictor of Severity, Rehospitalization and Prognosis in Hear Failure

Thesis
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بروتين سى التفاعلى ذو الحساسية العالية كوسيلة للتنبؤ بخطورة المرض وإعادة الحجز بالمستشفى والتقدم المرضى فى مرضى فشل عضلة القلب

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CONTENTS

List of Abbreviations

AHA	**American Heart Association**
AVP	**Arginine vasopressin**
ANP	**Atrial natruretic peptide**
ATP	**Adenosine triphosphate**
ATPase	**Adenosine triphosphatase**
ACS	**Acute coronary syndrome**
ACC	**American Collegue of Cardiology**
AMP	**Adenosine monophosphate**
ACEIs	**Angiotensin converting enzyme inhibitors**
ARBs	**Angiotensin receptor blockers**
Bark١	**Beta adrenergic kinase ١**
BNP	**Brain natruretic peptide**
CRT	**Cardiac resynchronization therapy**
cAMP	**Cyclic adenosine monophosphate**
cGMP	**Cyclic guanisine monophosphate**
CNP	**C-type natruretic peptide**
CABG	**Coronary artery by-pass graft .**
CRP	**C-reactive protein**
CONSENSUS	**Cooperative North Scandinavian Enalapril Survival Study**
CHARM	**Candesartan in Heart Failure- Assessment of Reduction in Mortality and Morbidity**
COPERNIUS	**Carvedilol Prospective Randomized Cumulative Survival**
CAPRICON	**Carvedilol Post-Infarct Survival Control in Left Ventricular Dysfunction**
CIBIS	**Cardiac Insufficiency Bisoprolol Study**
DM	**Diabetes mellitus**
DIG	**Digoxin Investigator Group**
ECG	**Electrocardiography**
ELISA	**Enzyme linked immunosorbent assay**
ELITE-II	**Losartan Heart Failure Survival Study-II**
ET	**Endothelin**
ECM	**Extracellular matrix**
EF%	**Ejection fraction%**
GIIb/IIIa	**Glycoprotein IIb/IIIa**
HF	**Heart failure**

H+	**Hydrogen ion**
HTN	**Hypertention**
Hs-CRP	**High sensitive C-reactive protein**
IL-١	**Interleukin – ١.**
IL-٦	**Interleukin – ٦.**
IL-IB	**Interleakin-IB**
IL-١٧	**Interleukin-١٧**
IgG	**Immunoglobulin G**
IVST	**Interventricular septal wall thickness.**
ICDS	**Implantable cardioverter defibrillator**
IABP	**Intra aortic ballon pump**
K+	**Potassium ion**
LV	**Left ventricle**
LVDD	**Left Ventricular diastolic diameter**
LVPWT	**Left ventricular posterior wall thickness**
LVSD	**Left Ventricular systolic diameter .**
LILA	**Liposome immunolysis assay**
LAT	**Latex agglutination test**
LN	**Laser nephlometry**
MI	**Myocardial infarction**
MR	**Mitral regurgitation**
NYHA	**New York Heart Association**
NPR-A	**Natruretic peptideA-receptor**
NPR-B	**Natruretic peptide B- receptor**
NE	**Norepinephrine**
Nacl+	**Sodium chloride ion**
Na+	**Sodium ion**
PKA	**Protein kinase A**
PCI	**Percutaneos coronary intervention**
PROVED	**Prospective Randomized Study of Ventricular Function and Efficacy of Digoxin**
RAS	**Renin angiotensin system**
RIA	**Radial immunodiffusion assay**
RIE	**Rocket immuno-elecrtophoresis**
RADIANCE	**Randomized Assessment of Digoxin and Inhibitors of Angiotensin-Converting Enzyme**
SWMA	**Segmental wall motion abnormality**

SAVE	**Survival and Ventricular Enlargment**
SOLVD	**Studies of Left Ventricular Dysfunction**
TNF	**Tumour necrosis factor**
TRACE	**Trandolapril Cardiac Evaluation**
VAD	**Ventricular assist devices**
Val-HeFT	**Valsartan Heart Failure Trial**
VALIANT	**Valsartan in Acute Myocardial Infarction Trial**
V-HeFT-II	**Vasodilator in Heart Failure II**
٦MWD	**٦ minute walk distance**

LIST OF FIGURES

List of Tables

Introduction

C-reactive protein (CRP) is a pentameric protein (pentaraxin) comprised of five identical units **(Osmand et al., ١٩٧٧)**.

In humans, the gene for CRP subunits is encoded in chromosome-١. A similar protein has been identified in virtually all mammals and in fish and chickens **(Volanakis et al., ١٩٩٠)**, indicating great evolutionary conservation **(Whitehead et al., ١٩٨٣)**.

Several functions have been attributed to C-reactive protein: CRP is capable of binding various biological substrates **(Ballou and Kushner, ١٩٩٢)**; it participates in the activation of the complement system and modulates the function of phagocytic leukocytes. CRP is also located at sites of inflammation **(Kushner and Kaplan, ١٩٦١)**; it enhances macrophage action on tumours **(Zanedi and Mortensen, ١٩٨٦)**; it is implicated in the synthesis of interleukine-١ and tumour necrosis factor **(Barna et al., ١٩٨٩; Vetter et al., ١٩٨٣)** and is capable of binding and blocking platelet activating factor. CRP is mainly produced in the liver in response to interleukine-٦.

Recently, evidence suggesting a process of low grade systemic inflammation has been implicated in atherosclerotic disease **(Chen et al., ١٩٩٩)**. Heart failure is one of the main consequences of atherosclerosis, and if a frequent cause of hospital admission **(Senni et al., ١٩٩٩)** and mortality, despite recent developments in therapy **(Pitt et al., ١٩٩٩)**.

Elevated levels of CRP have been observed in patients with heart failure **(Wordan, ١٩٩٨)**, and activation of the immune response may play a role in heart failure through modifications in the renin-angiotensin-aldosterone and sympathetic systems **(MacGowan et al., ١٩٩٧)**. We studied the role of CRP in patients admitted due to heart failure, with a follow-up of ٦ months.

Aim of the work

١. To determine the correlation between high sensitivity C-reactive protein and severity of heart failure (according to NYHA class and signs of heart failure).

٢. To determine the usefulness of high sensitivity C-reactive protein in predicting the prognosis and the need for readmission in patients with heart failure as detected by ٦ months follow-up.