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Case Report

Estimation of Oxidant and Anti-oxidant Status in Patients with Changeful Heart Discomfort and Myocardiac Breach of Diwaniya-Iraq

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Abstract

The present study aimed investigated the relationship between level oxidate and Anti-oxidant of patients with changeful heart discomfort pectoris, myocardiac breach and identify role oxidate in develop disease of individual province of diwaniya-iraq. The study of patients who are divided into three category (A) included 45 patients changeful heart discomfort pectoris in different age, category (B) included 45 patients with acute myocardiac breach at different age and category 45 (C) as control. The results demonstrate show a significant decrease ($p \geq 0.05$) in vitamin E, C, glutathion peroxidas and Glutathione (GSH) but the reverse was significant increase ($p \leq 0.05$) caeruloplasmin (ferroxidase enzyme), and Malondialdehyde (MDA) of individual changeful heart discomfort pectoris and myocardiac breach. The conclusion of study the negative role of high free radical was subsisted heart disorder progress. The acute myocardiac breach work reduction of oxygen delivery to myocardium lead generation of reactive oxygen groups that play an effective role in the pathogenesis heart disorder.

Keywords: Caeruloplasmin, Vitamin E, Vitamin C, Glutathione peroxidase, Myocardiac breach changeful heart discomfort

1. Introduction

Insultus heart disease in the smart majority of situation is caused by an imbalance between the myocardiac oxygen demand and the blood maunder [1]. Oxidative stress are essentially an imponderables between the produce of free radical and the ability of the body to abolish scavenge toxify harmful effects by equation by Anti-oxidants such as O2*(-), H_2O_2, and *OH, are generated extra or intra cellular and spend toxic effects on cells. The heart is one of the prime organs influence by free radicals. New proof suggests that oxidative stress is a common divisor in many guises

of problem cardiovascular diseases [2]. The cellular metabolism of oxygen generates potentially harmful reactive oxygen group, comprise superoxide anion, hydrogen peroxide and hydroxyl radical. Under normal physiology conditions, the rate and quantity of oxidant construction are balanced by the rate of oxidant remove. Conjugation, an imbalance between pro-oxidants and Anti-oxidants results in reactive oxygen group, which is the pathogenic result of the overproduction of oxidants that bash the cellular Anti-oxidant content. There is increase clue that increased reactive oxygen group and related oxidative damage are mediators of vascular damage in cardiovascular pathologies [3]. The radicals free contain one or more of unpaired electrons. They play a risk role in the pathogenesis of tissue damage in many clinical disorders. Oxygen free radical are mighty of damaging compounds of all biochemical division; including nucleic acid (DNA, RNA), protein, fatty acid, lipoprotein, carbohydrates and connective tissue macromolecules [4].

2. Material and Method

The present study was fulfilled of AL. Diwaniya teaching hospital, especially in the coronary care unit and the laboratories during the duration from 10/9/2017 to 31/3/2018. The study has been conducted on the total number of patients who are divided into 3 groups:

GROUP A: 45 patients with changeful heart discomfort pectoris [(30) males, (15) females] with age range (25-83).

GROUP B: 45 patients with acute myocardiac breach [(25) males, (20) females] with age range (40-85).

GROUP C: The control group, consisting of 45 healthy subjects [(30) males, (15) females] with no history of systematic illness.

2. 1 Collection of sample

From the patients with changeful heart discomfort, myocardia breach (10 mL) blood sample was pick is put into a glass tube without anticoagulant then they were centrifuged at 3000 rpm for 5 mins. The serum was separated and stored at (-20°C) until the time of the biochemical analysis.

2. 1. 1 The chemical analysis: The biochemical parameters which were studied in this study contain malondialdehyde (MDA), caeruloplasmin (ferroxidase enzyme), and which were measured according to [5-6]. Glutathion Peroxidas (GPx): The glutathion peroxidase activity was estimation by the method Paglia et al. [7]. Vitamin C was determined by titration procedure Varley et al. [8]. The level of reduced glutathion in serum was assessment by a method of Beutler [9] Vitamin E rating by Emmerie-Engel [10].

2. 2 Statistical analysis

Analyzed data were fulfilled by using SPSS program, a statistical significance of differences in data among studied groups was tested with F-test (ANOVA). The values were given in tables as (mean ± SD) and were statistically considered significant of probability ($p \leq 0.05$).

3. Result

Group	No.	Serum Malondialdehyde (nmol/L)*	caeruloplasmin (mg/L)*	P>
Control	45	13. 7 ±3. 4a	165. 70± 76a	0. 05
Changeful Heart Discomfort	45	73. 5 ±15. 6b	350. 30±9b	0. 04
Myocardiac Breach	45	98. 13 ±20. 7 c	366. 14± 10b	0. 03

Table 1: Malondialdehyde and caeruloplasmin (ferroxidase enzyme) changeful heart discomfort pectoris, myocardia breach and control.

The Malondialdehyde and caeruloplasmin (ferroxidase enzyme) watching increases significantly ($p \geq 0.05$) in category changeful heart discomfort pectoris, myocardia breach compared with control. Also watching significantly different between category changeful heart discomfort pectoris, myocardia breach in MDA. The data refers to mean ± SD. The latter (a, b, c) where considered significantly different ($p \leq 0.05$); No. -number of subjects; MB-myocardia breach patients; CHD-changeful heart discomfort patients.

The anti-oxidant Glutathione reduced, Glutathion peroxidase, Vitamin C, and Vitamin E was significantly decreased ($p \leq 0.05$) in myocardia breach patients, changeful heart discomfort category compared with control. Also watching significantly different between category myocardia breach, changeful heart discomfort.

Group	No.	Glutathion reduced (µM/l)	Glutathion Peroxidase (U/gm Hb)	Vitamin C (mg/dl)	Vitamin E (mg/dl)	P>
Control	45	78. 7 ± 3. 7 a	1. 7 ± 1. 5 a	1. 9 ± 1. 4 a	1. 7 ± 1. 3 a	0. 01
CHD	45	60. 4 ± 2. 5 b	0. 80 ± 0. 55 b	0. 75 ± 0. 49 b	0. 79 ± 0. 50 b	0. 01
MB	45	40. 9 ± 2. 6 c	0. 70 ± 0. 40 c	0. 70 ± 0. 3 b	0. 65 ± 0. 3 c	0. 02

The data refers to mean ± SD; the letters (a, b, c) where considered significantly different ($p \leq 0.05$); No. -number of subject; CHD-changeful heart discomfort; MB-Acute myocardiac breach.

Table 2: Oxidative stress: reduced glutathion, glutathione peroxidase, vitamin C, and vitamin E.

4. Discussion

4. 1 Malondialdehyde and caeruloplasmin (ferroxidase enzyme)

Significant increase in MDA measure ($p \leq 0.05$), a lipid peroxidation outcome, in our patients is indicative of elevated oxidative stress in CHD patients. This is like to work [12, 13] who exhibit a reduction in anti-oxidant enzyme activities and elevated in lipid peroxidation output (MDA, TBARS) in patients with CHD, MB. Mention Al-Fartosi et al. that the measure of serum MDA increases significantly because during acute coronary syndromes (CHD, MB) by multiple processes are thought to be share e. g. (leukocytosis). It seems logical to expect a raised MDA measure, by an action of group oxygen active during the phagocytosis process [14]. Also, mention Misra et al. The heart is one of the mine

organs damage by group oxygen active. Recent proof reference that oxidative stress is a common divisor in multiple portion of cardio vascular diseases. During myocardiac oxidative stress, the genesis of group oxygen active is elevated and the defense mechanisms of myocytes are lower. The origin of group oxygen active in cardiac myocytes may be mitochondrial electron transport chain, nitric oxide synthase (NOS), NADPH oxidase, xanthine oxidase, and lipoxygenase, cyclooxygenase and the auto-oxidation of different material, particularly cate cholamines. In acute myocardiaic breach (MB), two distinguished types injury induce of heart: Insultus damage and reperfusion damage, which progressive to mitochondrial dysfunction in heart cells [2] which agree with study condition. Caeruloplasmin is a α2- globulin consist copper, and serious extracellular anti-oxidant [15]. Caeruloplasmin activate as an anti-oxidant (host vindication mechanism) through ferroxidase activate superoxide radical scavenging, and copper donor activate [16] an acute phase respond. It was demonstration that caeruloplasmin manifest pro-oxidant activity and causes oxidative modification of low density lipoprotein. This tick that ferroxidase enzyme is an independent danger factor for cardio vascular problem [17].

4. 2 Glutathion reduced, Glutathion peroxidase, Vitamin C, and Vitamin E

In CHD, MB patients, we found significantly lower measure of vitamins E and C, compared with controls. This is in correspond with studies of Singh et al. [18], who show that there was a significant lower in Vitamins C, E, A and ß carotene, whereas lipid peroxides were significantly higher in CHD patient comparative with controls. This expresses severe injury to the anti-oxidant regulation, which is incapable to fighting oxidative stress and inflammation. Our discovery indicates the survival of an abnormal balance between the oxidative and keep mechanisms in CHD patients. Also, refer Bashar and Akhter that a cause for raise lipid peroxidation of patients with CHD may be a reduce enzyme and non-enzyme anti-oxidant protective suit. Reduced glutathion (GSH) is one of the important indoor non-enzymatic anti-oxidants. It equipping a sulphydryl (SH) group for direct scavenging reactions. Reduced glutathion work both as a material in the scavenging reaction catalyzed glutathion peroxidas (GPx) and as a scavenger of peroxyl radical. Our data showed that Reduced glutathion measure was significantly decrease in patients as compared to control and a negative role was notes between measure and Malondialdehyde measure in patients [19]. this study agree with the study condition.

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