The Role of Osteponitn in Serum Patients Heart Disease

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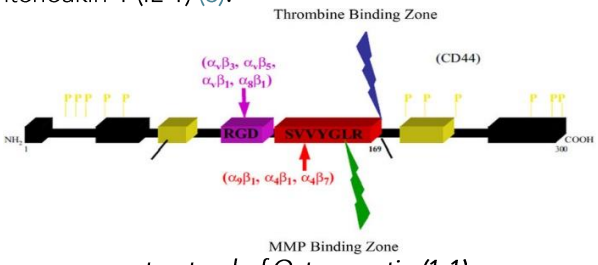
Abstract
Background: One of the dangerous and critical diseases is myocardial infarction (MI). In order to save the heart muscle from damage, the patient needs quick and superior medical and nursing care. (1) Myocardial infarction can lead to cardiac arrest through several ways, including ventricular arrhythmias, which is one of the most common causes that cause ventricular fibrillation, in addition to cell death in myocardial infarction. As the death rate reaches 40% during the first three days, the patient is placed under supervision in the coronary care unit (CCU). If an obstructive thrombus occurs at the site of coronary atherosclerosis, it leads to a myocardial infarction. The blockage of the coronary artery is either partial, leading to infarction of the area prepared by that artery, or a complete blockage of the main coronary artery, which is often fatal (2). Since the artery is not opened during the onset of clots, the heart cells begin to die, which has been cut off from the blood supply, and as a result it is not curable (3).
Keywords: Myocardial infection, Osteopontin

1. Introduction

Osteponitn Also known as sialoprotein (BSP-1), the word osteopontin is made up of two syllables: osteo, meaning bone, and pontin, meaning bridge. Osteopontin is present in many tissues such as saliva, heart, bile and dentin layer in the teeth, kidneys, brain, bone marrow, smooth muscle cells, skeletal muscle cells, salivary glands, uterus and pancreas. Moreover, it is released from bone tissue by osteoblasts (4).

2. Structure

Osteopontin is a structural protein outside the human cell consisting of 314 amino acids with a molecular weight (kDa 75-44). It has 30 carbohydrate molecules, ten of which are lion wires. (4913)4 Where many shapes with different particles were discovered (5). There are many binding regions in the osteopontin Calcium bond, two heparin bonds, thrombin bonds, and arginine-glycine-spartic acid. Binding regions: Matrix metallo proteases at (3,7) (MP3.7) are also attached to osteopontin. The N-terminal and C-terminal binding regions are It is different in osteopontin. The C-terminal binds two heparin molecules and a cell surface glycoprotein antigen CD44, while the N-terminal contains the integrin receptor regions. Injury cells cause increased production of osteopontin as well as infection. Infection is associated with cytokines. Tissue and osteopontin genes are stimulated by macrophages, bone necrosis factor (TNF) and interleukin-1 (IL-1) (6).



structural of Osteopontin (1-1)

3. Functions

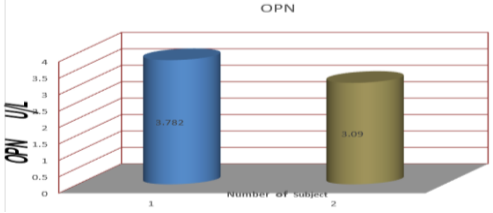
Osteopontin, also known as sialoprotein, plays many physiological roles such as rebuilding bone tissue, participating in inflammation, regulating growth, bone balance (catabolism and building) extracellular tissue, bone tissue mineral balance, affecting the quality of collagen fibers in the bone and also has a role in many pathological conditions such as Cardiovascular disease, diabetes, cancer, kidney stones, many inflammatory diseases, cell viability (percentage of live cells), wound healing (7).

Its relationship to heart disease

Inflammatory cytokines are essential for the acute response to inflammatory injury and the gradual healing process. However, when this response does not heal and the injury becomes chronic, the same proteins that promote healing contribute to chronic diseases such as atherosclerosis. Significant in acute and chronic inflammatory conditions and may be involved in pathophysiological processes. Chronic increase in osteopontin is clinically associated with a higher cardiovascular risk. Osteopontin is a strong predictor of cardiovascular disease, regardless of conventional risk factors. of dead cells and fibrotic areas during wound healing (8).

4. Results

Osteopontin level (OPN)



1- patient 2-control
Figure (1-1) shows the mean osteopontin (OPN) concentration in the serum of myocardial infarction patients with the control group

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The results obtained showed an increase in plasma osteopontin levels in patients with myocardial infarction, regardless of the cause of the rise, compared with the control group, with a statistical difference of (p≤ 0.419), where the level of osteopontin concentration (OPN) in patients with myocardial infarction (11 ± 23), while the results for the control group were (12 ± 33), as shown in Table (1-1) and Figure (1-1)

Table (1-1) shows the measurement of the level of osteopontin (OPN).			
Parameter	Control Mean ± S.D N=20	Patients Mean ± S.D N=60	p-Value
OPN (ng/ml)	3.01± 3.1	5.58 ±3.78	0.49 =

These results are in agreement with the research that dealt with the study of the role of osteopontin protein (OPN) as one of the inflammatory cytokines whose levels are elevated in patients with myocardial infarction (10) (9).The reason for the high level of plasma osteopontin (OPN) concentration in a group of heart failure patients can be explained by Increasing mechanical stress as a result of stress overload, myocardial infarction, myocardial infarction, or increased levels of angiotensin II, which in turn increases in this case, which stimulates the production of osteopontin (OPN) in cardiomyocytes and fibroblasts, effectively contributing to its restoration. The process of remodeling the cardiac muscle as well as fibrosis (11). The high levels of osteopontin (OPN) are consistent with the severity of the disease as a result of the increase of the bad effects on the cardiomyocytes with the development of the condition as a result of the increased pressure overload, as the expression of osteopontin (OPN) increases with the increase in the area of Damaged areas of the heart muscle where osteopontin (OPN) is produced by There are two sources in this case, and these sources are macrophages located in the injury area and fibroblastic cells, in addition to the increased expression of inflammatory cytokines with the development of heart failure, which in turn works to stimulate the expression of the gene expression of osteopontin protein (OPN) (12) .

Chronically elevated OPN levels are associated with an increased risk of cardiovascular damage, and OPN is a strong predictor of cardiovascular disease regardless of conventional risk factors (13).

Recently there has been a lot of interest in OPN as a biomarker for various pathological conditions such as multiple sclerosis, neurodegenerative diseases (Alzheimer's for example), coronary artery disease and many types of cancers (14).

Relationship with the patient s Age

Groups Age (Year)	N	Mean ± SD OPN ng/ml		N	p-value
		Control	Patients		0.916 ≤
(20-40)	13	3.36 bc± 1.62	2.4 c ± 1.9	2	
(41-60)	7	2.61 ab± 1.39	3.43 bc 1.72	32	
(61-80)			4.33 ab ± 1.71	26	

Relationship with the patient s gender					
Parameter	Control Mean ± S.D N=11 Male	Control Mean ± S.D N=9 Female	Patients Mean ± S.D N=41 Male	Patients Mean ± S.D N=19 Female	p-value
OPN (ng/ml)	2.97 b± 1.38	3.25 b±1.66	3.602a± **1.618**	2.58a± **1.947**	≤0.86

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