Angiographic Evaluation of Coronary Artery In Patients With Metabolic Syndrome Presenting With Stable and Unstable Angina Compared To That Of Patients without Metabolic Syndrome

Thesis

Submitted for Partial Fulfillment of the Master Degree In
Cardiology

By

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2009

INTRODUCTION

Coronary artery disease is the most common form of heart disease and remains by far the first cause of death. The incidence of coronary artery disease is increasing rapidly in many countries ***(Naghavi et al., 2003)***.

Angina pectoris is the result of myocardial ischemia caused by an imbalance between myocardial blood supply and oxygen demand. Angina is common presenting symptom (typically, chest pain) among patients with coronary artery disease ***(Rocco et al., 2002)***.

Patients with metabolic syndrome have a 3-fold increased risk for coronary atherosclerosis and stroke compared with those without this syndrome ***(Ford et al., 2002)***.

The metabolic syndrome characterized by variable coexistence of hyperinsullinemia, obesity, dyslipidemia, hypertension. This multifactorial and complex trait of metabolic syndrome lead to increased risk of cardiovascular disease ***(Kolovou et al., 2007)***.

Diabetes mellitus is a powerful independent predictor of coronary artery disease because diabetes mellitus accelerate the process of atherosclerosis. This acceleration may be attributed to coexistence hypertension, hyperlipidemia, obesity and insulin resistance. Diabetes mellitus is associated with metabolic abnormalities in the transport, composition and metabolism of lipoprotein ***(Cutinho et al., 1999)***.

Hypertension promotes atherogenesis mainly via thickening of the arterial intima. Pathological studies of human atherosclerosis have shown that lesion progression occurs only in arteries where a threshold of intimal wall thickness is exceeded. Thus, the mechanism of atherogenesis may involve excessive diffusion distances for intimal LDL and HDL in the arterial wall that has been thickened by hypertension ***(Bot et al., 2007)***.

Aim of the Work

The aim of the study is to assess the relation between metabolic syndrome and the severity of coronary artery disease in patients presenting for elective coronary angiography, compared to that of patients without metabolic syndrome .

Subjects and Methods

The study will be done on 100 patients , fifty patients with metabolic syndrome and another fifty patients without metabolic syndrome presenting at Nasser Institute Hospital with stable and unstable angina and schedule for coronary angiography.

Inclusion criteria :

** First group (with metabolic syndrome)

Patients presenting for elective coronary angiography and have elevated waist circumference, greater than 80 cm for women and 94 cm for men and have three of the following four items :

- Elevated level of triglycerides of 150 milligrams per deciliter (mg/dL) or higher, or on treatment for elevated triglycerides.
- Reduced HDL (less than 40 mg/dL in men or less than 50 mg/dL in women) or on treatment for reduced HDL-C.
- Elevated blood pressure of 130 millimeters of mercury (mmHg) systolic or higher or 85 mmHg diastolic or higher, or on treatment for elevated blood pressure.

** Second group (without metabolic syndrome)

Patients presenting for elective coronary angiography with stable and unstable angina , and without metabolic syndrome .

Exclusion criteria :

**First group(with metabolic syndrome)

Patients failing the criteria of metabolic syndrome.

Patients have diabetes mellitus.

** Second group(without metabolic syndrome)

Patients have metabolic syndrome .

Patients have diabetes mellitus.

All patient will be subjected to complete medical history :

- Personal history
- Complain
- Present history
- Past history
- Family history

Investigation:

- Electrocardiography

Laboratory examination before coronary angiography :

- Fasting blood sugar.
- Serum triglycerides.
- High density lipoprotein cholesterol (HDL-C).

Coronary angiography :

- In the presence of lesion , the lesion will be classified according to ACC/AHA lesion classification system. This classification based on the following parameters :

Length, eccentricity, angulation, calcification, involvement of side branches, thrombus, and severity of stenosis .

Type A Lesions (high success, >85%; low risk)	
Discrete (<10 mm)	Little or no calcium
Concentric	Less than totally occlusive
Readily accessible	Not ostial in locations
Nonangulated segment, <45 degrees	No major side branch involvement
Smooth contour	Absence of thrombus
Type B Lesions (moderate success, 60-85%; moderate risk)	
Tubular (10 to 20 mm length)	Moderate to heavy calcification
Eccentric	Total occlusions <3 mo old
Moderate tortuosity of proximal segment	Ostial in location
Moderately angulated segment, ≥45 degrees, <90 degrees	Bifurcation lesion requiring double guidewire
Irregular contour	Some thrombus present
Type C Lesions (low success, <60%; high risk)	
Diffuse (>2 cm length)	Total occlusion >3 mo old
Excessive tortuosity of proximal segment	Inability to protect major side branches
Extremely angulated segments, ≥90 degrees	Degenerated vein grafts with friable lesions

Circulation 88 2987 ,1993

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تقييم قصور الشرايين التاجية للقلب بالقسطرة التشخيصية لدى مرضى الذبحة الصدرية المستقرة وغير المستقرة ذوي متلازمة الأيضي ومقارنتهم بالمرضى الذين لا يعانون من متلازمة الأيضي

رسالة

توطئة للحصول على درجة الماجستير في **أمراض القلب والأوعية الدموية**

مقدمة من

الطبيب / محسن النقراشي عبداللطيف

بكالوريوس الطب والجراحة

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مقدمـــة

يعد مرض قصور الشرايين التاجية للقلب هو الشكل الأكثر شيوعاً لأمراض القلب وحتى الآن لا تزال السبب الأول للوفاة من أمراض القلب.

تحدث الذبحة الصدرية نتيجة لقصور متعلق بعضلة القلب الناجم عن عدم التوازن بين كمية الدم الواصلة لعضلة القلب ومدى احتياجها من الأوكسجين. وتعتبر الذبحة الصدرية هي أكثر عرض من أعراض المرضى الذين يعانون من مرض قصور الشريان التاجي.

يعد مرضى متلازمة الأيضي أكثر عرضه لزيادة خطر تصلب الشرايين التاجية والسكتة الدماغية مقارنة مع من دون هذا المرض.

يتميز مرض متلازمة الأيضي بوجود ارتفاع بنسبة سكر الدم، السمنة، ارتفاع ضغط الدم، واختلال بنسبة الكوليستيرول والدهون الثلاثية بالدم. هذا التعدد والتعقيد من سمات متلازمة الأيضي يؤدي إلى زيادة خطورة أمراض القلب والأوعية الدموية.

يعتبر مرض ارتفاع سكر الدم من الدلالات القوية المستقلة للتنبؤ بمرض قصور الشريان التاجي بسبب تسريع عملية تصلب الشرايين بارتفاع سكر الدم. ومن المحتمل أن تكون هذه السرعة ناتجة عن تواجد ارتفاع ضغط الدم، اختلال الكوليستيرول والدهون الثلاثية، البدانة ومقاومة الأنسولين.

ويرتبط مرض ارتفاع السكر بالدم مع اختلال عملية الأيض في النقل، التكوين، الأيض في الكوليستيرول.

يعزز ارتفاع ضغط الدم عملية تصلب الشرايين عن طريق زيادة سماكة الطبقة الداخلية من الشرايين. وأوضحت دراسات تصلب الشرايين أنها تحدث بالشرايين التي تجاوزت بها هذه السماكة القدر المحتمل للشريان. وتؤدى عملية تصلب الشرايين إلى انتشار الكوليستيرول منخفض ومرتفع الكثافة في الجدران السميكة الناتجة عن ارتفاع ضغط الدم.

الهدف من الدراسة :

تهدف الدراسة إلى تقييم العلاقة بين متلازمة الأيضي وقصور الشرايين التاجية للقلب ومقارنة قصور الشريان التاجى لدى مرضى متلازمة الايضى والمرضى الذين لا يعانون من متلازمة الايضى .

المرضى والوسائل :

تشتمل الدراسة على مائة حالة, خمسون حالة يعانون من متلازمة الأيضي و الخمسون الاخرون لا يعانون من متلازمة الايضى وذلك بعمل قسطرة تشخيصية للشرايين التاجية للقلب.

طرق البحث :

يتم إتباع الآتي مع جميع المرضى :

- أخذ التاريخ المرضى.
- القيام بعمل رسم قلب .
- قياس نسبة السكر بالدم.
- قياس مستوى الدهون الثلاثية والكوليسترول بالدم.
- عمل قسطرة تشخيصية للشرايين التاجية للقلب.

INTRODUCTION

Coronary artery disease is the most common form of heart disease and remains by far the first cause of death. The incidence of coronary artery disease is increasing rapidly in many countries *(Naghavi et al., 2003)*.

Angina pectoris is a clinical syndrome characterized by discomfort in chest, jaw, back or arm typically aggravated by exertion or emotional stress and relieved by rest or nitroglycerin.

Angina pectoris is usually associated with epicardial CAD with obstructions of one or more vessels greater than 70%, but it can also occur in patients with valvular heart disease, hypertrophic cardiomyopathy or uncontrolled hypertension. Unstable angina is the term used to describe patients who present with new onset angina that is sever and/or frequent, rapidly increasing angina, or sever angina at rest. It is a life threatening disorder and a major cause of emergency medical care *(Braunwald et al., 2008)*.

Unstable angina is a complex condition. The most important pathophysiological mechanism of

ischemia is an acute or subacute primary reduction of myocardial oxygen supply provoked by disruption of an atherosclerotic plaque associated with inflammation, thrombosis, vaso-constriction and microembolization. The insulin resistance/metabolic syndrome is characterized by the variable coexistence of hyperinsulinemia, obesity, dyslipidemia, hypertension. This multifactorial and complex trait of metabolic syndrome leads to increased risk of cardiovascular disease *(Kolovo et al., 2007)*.

Diabetes is a major risk factor for cardiovascular morbidity and mortality. This condition increases the risk of developing coronary, cerebrovascular, and peripheral arterial disease up to 4-fold *(Gerstein et al., 1999)*.

The relationship between increasing body weight and cardiovascular disease risk factors has been well established; a 10kg weight gain produces approximate 3-mmHg rise in systolic blood pressure and a 2-mmHg rise in diastolic blood pressure, and increase the risk of coronary heart disease and stroke. Obesity not only predisposes to insulin resistance and diabetes, but also contributes to atherogenic dyslipidaemia. High levels of free fatty acids originating from visceral fat