PREDICTIVE VALUE OF SERUM INTERLEUKIN-6 TO DETERMINE CORONARY ARTERY DISEASE IN INTERMEDIATE CARDIOVASCULAR RISK INDIVIDUALS

Mohamed Ahmed Sobhy, Tarek Hussein El-Zawawy, Moataz Ahmed Zaki,* Mostafa Mostafa Mostafa El-Amrousy
Department of Cardiology and Angiology, Faculty of Medicine, Department of Experimental and Clinical Internal Medicine, Medical Research Institute,* Alexandria University

INTRODUCTION

Coronary artery disease (CAD) among non-communicable diseases is the leading cause of cardiovascular mortality worldwide, with more than 4.5 million deaths occurring in the developing world.The precision in estimating the risk for future CAD is crucial for treatment decision and prevention strategies. It is crucial to improve accuracy in risk prediction for patients with intermediate cardiovascular risk, as calibration is limited when using global risk score calculators. The 2013 ACC/AHA guidelines currently suggest the use of a 10-year ASCVD risk score for estimating the risk of future coronary events and for identifying primary prevention strategies.

Despite the importance of this approach, the precision in patients with intermediate coronary risk is less precise than in higher or lower risk categories.Increased levels of inflammatory agents, including IL-6, have been reported as been associated with acute ischemic conditions and are predictors of recurrent events in patients with CAD.

AIM OF THE WORK

The aim of this study was to analyze the predictive value of IL-6 for diagnosis of Coronary artery disease (CAD) and correlating the results with extent of CAD using Gensini score in intermediate-risk patients with chest pain.

PATIENTS AND METHODS

The study will include 40 patients aged between 40 and 79 years and chronic chest pain. Patients will refer for coronary angiography due to chest pain in hospitals of Alexandria University.

Coronary Angiography:

The procedure was performed by trained invasive cardiologists who were be blinded to all other clinical variables according to standard techniques.

Biochemical Measures:

Peripheral venous blood was be obtained from the patients between 12 and 24 hours after coronary angiography or PCI to measure serum interleukin (IL)-6 level by Roche IL-6 electro chemiluminescence immunoassay according to manufacturer's instructions.

ASCVD risk score:

The atherosclerotic cardiovascular disease (ASCVD) risk score will be calculated based on AHA/ACC 2013 guidelines to estimate the 10-year risk score for men and women from 40 to 79 years of age for a first hard ASCVD event. We considered intermediate risk when the 10 years score will be between 7.5 and 20%.

RESULTS

This prospective study was conducted at the Department of Cardiology and Angiology, Alexandria University. It included 40 intermediate-risk patients aged 40–79 years with chronic chest pain, referred for coronary angiography.

According to coronary angiography, patients were classified into two groups:

CAD group: Twenty-five participants diagnosed with CAD.

No CAD group: Fifteen participants without CAD.

General characteristics in patients with and without CAD

Patients with CAD had a significantly higher ASCVD risk score compared to those without CAD (median: 12.4 [7–19.9] vs. 8.1 [7.1–14.4], P = 0.038). Other variables, including age (P = 0.671), gender (P = 0.231), smoking (P = 0.06), hypertension (P = 0.283), SBP (P = 0.059), and DBP (P = 0.794), were not significantly different between the two groups. **Table1, Figure1.**

Table 1: General characteristics in patients with and without CAD

		CAD (n=25)	No CAD (n=15)	P-value
Age (Years)	Mean ±SD	59 ±7	60 ±7	0.671
Gender				
Males	n (%)	18 (72)	8 (53.3)	0.231
Females	n (%)	7 (28)	7 (46.7)	
Smoking	n (%)	16 (64)	5 (33.3)	0.06
HTN	n (%)	9 (36)	8 (53.3)	0.283
SBP	Mean ±SD	127 ±9	136 ±15	0.059
DBP	Mean ±SD	82 ±7	82 ±10	0.794
ASCVD Risk	Median (range)	12.4 (7 - 19.9)	8.1 (7.1 - 14.4)	0.038*

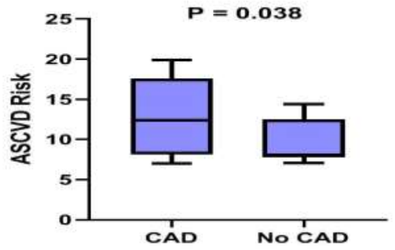

Figure1:

ASCVD risk in participants with and without CAD.

Laboratory findings in patients with and without CAD

Patients with CAD had significantly higher IL-6 levels compared to those without CAD (median: 3.01 [1.7–10.81] vs. 1.7 [0.91–2.8], P < 0.001). Other laboratory variables, including urea (P = 0.472), creatinine (P = 0.614), total cholesterol (P = 0.063), and HDL (P = 0.476), were not significantly different between the two groups. **Table 1, Figure 1**

ROC analysis of IL-6 to predict CAD

ROC curve analysis was done for IL-6to predict CAD. It revealed a significant AUC of 0.889 with a 95% confidence interval ranging from (0.791 – 0.987), suggesting excellent ability to predict CAD. The best cutoff was >2.7, at which sensitivity, specificity, PPV, and NPV were 68%, 93.3%, 94.4%, and 63.6%, respectively. **Table 2, Figure 2.**

Table 2: Laboratory findings between patients with and without CAD

		CAD (n=25)	No CAD (n=15)	P-value
Urea	Mean ±SD	30.1 ±5	28.7 ±7.3	0.472
Creatinine	Mean ±SD	0.96 ±0.16	0.93 ±0.14	0.614
Total Cholesterol	Mean ±SD	227.08 ±32.59	202.06 ±50.08	0.063
HDL	Mean ±SD	39.3 ±9.84	41.81 ±11.98	0.476
IL-6	Median (range)	3.01 (1.7 - 10.81)	1.7 (0.91 - 2.8)	<0.001*

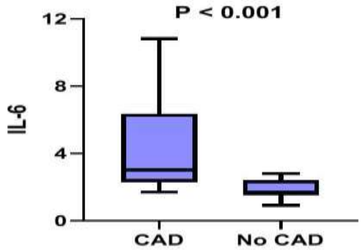

Figure2:

IL-6 in participants with and without CAD.

CONCLUSION

This Study Highlights :

- IL-6 plays a significant role as a predictive biomarker for coronary artery disease (CAD) in intermediate-risk patients with chest pain.
- Elevated IL-6 levels are strongly linked to the presence of CAD.
- IL-6 levels show a strong correlation with CAD severity, as assessed by the Gensini score.
- A positive association is observed between IL-6 levels and the ASCVD risk score, reinforcing its potential utility in risk stratification.