Value of Platelet/Lymphocyte Ratio as a Predictor of Coronary Artery Disease Severity

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Background

Platelet-to-lymphocyte ratio (PLR) is a new prognostic marker that integrates the risk prediction of these two parameters into one. It gives an idea about both the aggregation and inflammation pathways, and it may be more valuable than either platelet or lymphocyte count alone in the prediction of coronary atherosclerotic burden.(1)

Also, ongoing inflammatory conditions lead to increased proliferation in megakaryocytic series and relative thrombocytosis. Previous studies demonstrated an association between high circulating platelet count and major adverse cardiovascular outcomes in patients with coronary artery disease (CAD) and also in healthy adults .(2)

Moreover, higher PLR value emerged as a significant independent predictor of long-term mortality in patients presented with acute coronary syndrome and as an independent predictor of no-reflow development in patients undergoing primary PCI .(3)

Aim

The aim of the work is to explore Value of platelet/lymphocyte ratio as a predictor for Coronary artery disease severity. .

Methods

One hundred subjects were enrolled in this study; 10 with normal subject control(patients with normal coronary angiography), 50 with sever atherosclerosis (Gensini score ≥25 points), and 40 with mild atherosclerosis (Gensini score <25 points). All subjects underwent elective diagnostic coronary angiography, laboratory investigation, ECG and Echocardiography.

Results

In the severe atherosclerosis group, platelet/lympohcyte ratio was found to be highly significantly correlated with Gensini score, triglycerides, platelet count and lymphocyte count ($p < 0.001$) and significantly correlated with low-density lipoprotein, high-density lipoprotein and white blood cell count ($p < 0.05$), but there were non-significant correlations with age, total cholesterol, fasting blood sugar, serum creatinine, hemoglobin concentration and ejection fraction ($p > 0.05$**). In the mild atherosclerosis group**, platelet/lymphocyte ratio was found to be highly significantly correlated with Gensini score and lymphocyte count ($p < 0.001$), significantly correlated with low-density lipoprotein, white blood cell count and platelet count ($p < 0.05$), but there were non-significant correlations with age, total cholesterol, high-density lipoprotein, triglycerides, fasting blood sugar, serum creatinine and ejection fraction ($p > 005$).

Table :ROC curve for prediction of sever atherosclerosis by PLR

AUC	95% CI		Cutoff	Sensitivity	Specificity	PPV	NPV	Accuracy
	Lower	Upper						
0.748	0.621	0.875	> 97.4	76%	60%	90.5	33.3%	73.3%

Conclusion

PLR seems to be a simple method to predict severity of CAD in patient undergoing elective coronary angiography and it may be part of cardiovascular examination before elective coronary angiography. The high PLR appears to be additive to conventional risk factors and commonly used biomarkers in predicting severe atherosclerosis and that PLR is an independent predictor of Gensini score, its value correlates positively with Gensini score. When considering that PLR is a calculation of routine complete blood count parameters that does not require any additional expense and it is a readily available, easily done marker, it can help to identify individuals at high risk for advanced CAD who might need a more aggressive therapeutic approach and closer clinical follow up.

Cases

Male patient 69 years old diabetic, hypertensive, dyslipidemic but non- smoker with no family history of ischemic heart disease complaining of chest pain.

Diagnostic coronary angiography:

LM: **normal vessel**

LAD: **atherosclerotic vessel with proximal lesion 80% stenosis and midsegment lesion 60% stenosis and distal lesion 60% stenosis**

First diagonal branch shows mild non significant 50% lesion

LCX: **atherosclerotic vessel that shows 50% lesion in its proximal segment.First obtuse marginal branch:atherosclerostic vessel that shows 70% lesion,Secend obtuse marginal branch: atherosclerostic vessel that shows subtotal occlusion**

RCA: **ectatic dominant vessel that shows distal 40% lesion Gensini score: 73**

Figure 1: RAO view of the left coronary system with caudal angulation

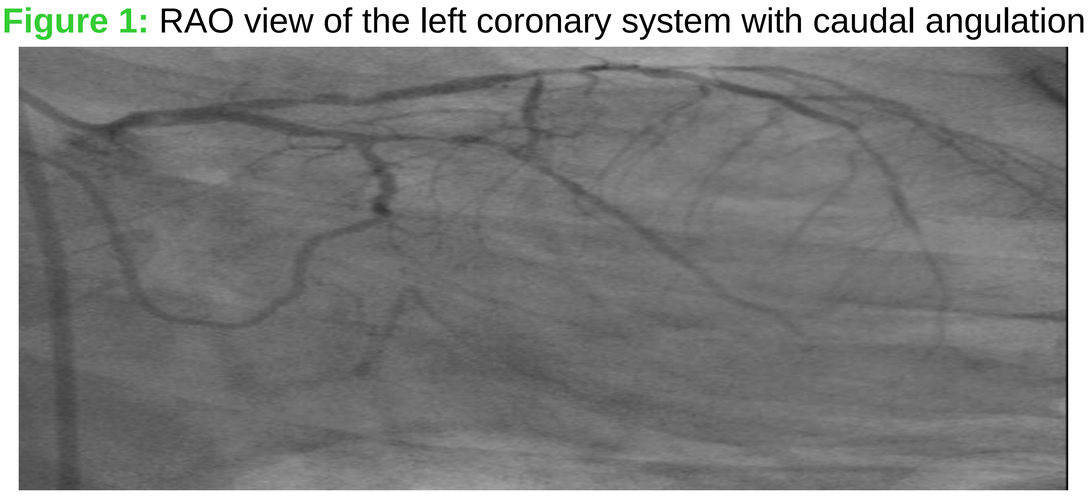


Figure 2: RAO view of the left coronary system with cranial angulation

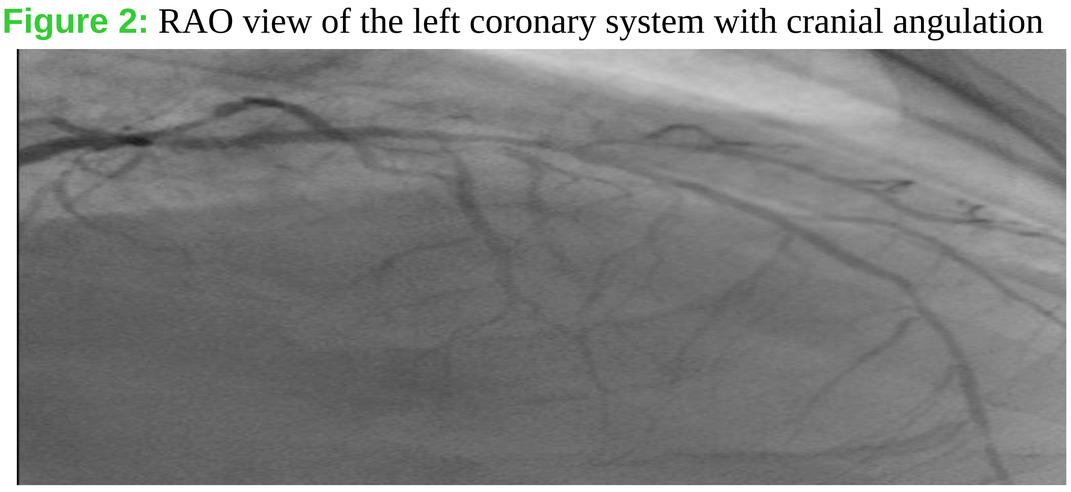
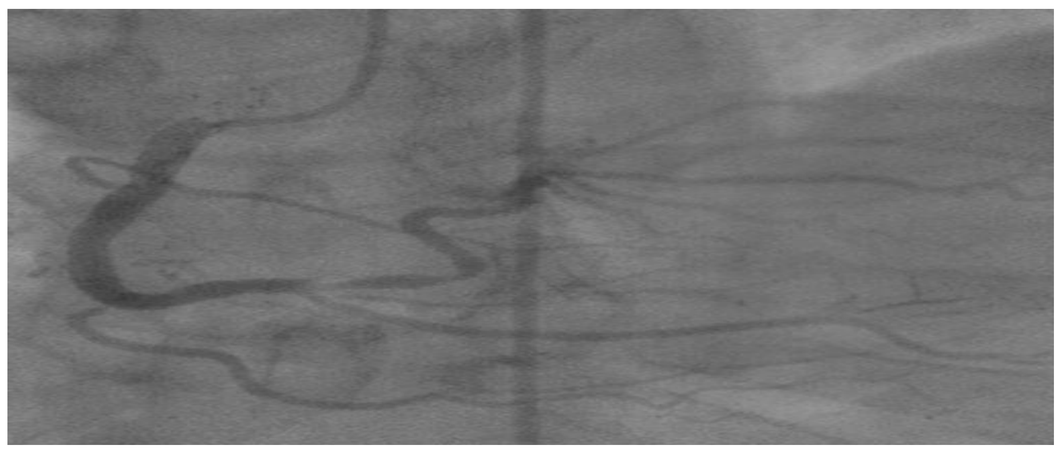


Figure 3: AP view of the right coronary artery with cranial angulation.



References

1-Yuksel M, Yildiz A, Oylumlu M, et al. (2015): The association between platelet/lymphocyte ratio and coronary artery disease severity. Anatol J Cardiol; 15: 640-7.

2-Nikolsky E, Grines CL, Cox DA, et al (2007): Impact of baseline platelet count in patients undergoing primary percutaneous coronary intervention in acute myocardial infarction (from the CADILLAC trial). Am J Cardiol 99: 1055-61.

3-Azab B, Shah N, Akerman M, McGinn JT Jr (2012): Value of platelet/lymphocyte ratio as a predictor of all-cause mortality after non-ST-elevation myocardial infarction. J Thromb Thrombolysis; 34(3): 326-334.