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Research Article

Relation between systemic immune inflammatory index and coronary lesions-syntax score in patients undergoing elective coronary angiography

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Abstract

Background: Atherosclerosis is known to be the most common underlying pathology of coronary artery disease (CAD). Leukocyte recruitment and proinflammatory cytokines were found to participate essentially in the process of atherogenesis. Systemic immune inflammatory index (SII) is derived by calculating both platelet counts and neutrophil/lymphocyte ratio (NLR) [SII = platelets count *NLR]. SII is suggested to have prognostic value regarding mortality in patients with CAD, myocardial infarction (MI) and acute coronary syndromes (ACS). **Aim of the Work:** to investigate the relation between the systemic inflammatory and immune state of the patient using SII and the extent of atherosclerosis of coronaries assessed by SYNTAX score in patients undergoing elective coronary angiography. **Patients and Methods:** This cross-sectional study was conducted on 113 patients undergoing elective coronary angiography divided into three groups according to SII; Lower SII group (n=64), intermediate SII group (n=30), and High SII group (n=19). **Results:** Our results showed statistically significant difference among the three groups regarding SYNTAX score being higher in intermediate SII group and high SII group compared to lower SII group with moderate positive correlation between SYNTAX score and SII. Moreover, SII was the most independent predictors for both low and high SYNTAX score. **Conclusion:** SII is correlated with extent of CAD assessed by SYNTAX score among patients with chronic coronary syndrome (CCS) undergoing elective coronary angiography.

Keywords: Atherosclerosis, Chronic coronary syndrome, elective coronary angiography, Systemic immune inflammatory index, SYNTAX score.

Introduction

Atherosclerosis is known to be the most common underlying pathology of coronary artery disease, that leads to subendothelial intimal injury and formation of vessel occluding plaques, leading to major adverse events like myocardial infarction, which is major cause of death worldwide [(1)]. Atherosclerosis constitutes a dynamic inflammatory process in the vasculature that plays an important role in all stages of the atherosclerotic process [(2)]. Leukocyte recruitment and proinflammatory cytokines were found to participate essentially in the process of atherogenesis [(3)]. SII was firstly described by Hu et al., as a prognostic tool that Predicts Prognosis of Patients after Curative Resection for Hepatocellular Carcinoma[(4)]. Considering both the inflammatory and immune status, SII is derived by calculating both platelet counts and neutrophil/lymphocyte ratio (NLR) [SII = platelets count *NLR][(5)]. Recently, SII is suggested to have prognostic value regarding mortality in patients with

coronary artery disease, myocardial infarction and acute coronary syndromes[6].

The visualization of the coronary tree using contrast media injections and different radiographic projections via coronary angiography remains the best way upon which the invasive coronary anatomical assessment and CAD diagnosis are based. Such data obtained through elective coronary angiography is pivotal prior to the decision of revascularization either through percutaneous coronary interventions (PCI) or coronary artery bypass grafting (CABG). the Synergy Between PCI with TAXUS and Cardiac Surgery (SYNTAX) trial introduced the SYNTAX Scoring system as an important tool for the evaluation of coronary artery lesions including type, extent and severity of lesions [7].

Aim of the Work

To investigate the relation between the systemic inflammatory and immune state of the patient using the SII and the extent of atherosclerosis of the coronary arteries assessed through SYNTAX scoring system in patients undergoing elective coronary angiography.

Patients and Methods

A cross sectional study recruited patients undergoing elective coronary angiography and justifying the inclusion criteria from Minia University cardiology department and Sohag Heart Center. Patients who were adult patients (age ≥ 18 years old), fulfilling the criteria suggesting stable CAD as defined by the 2019 ESC Guidelines for the diagnosis and management of CCS [8] and were candidate for elective coronary angiography were included to study. On the other hand, patients with age < 18 years old, ACS, previous PCI or CABG, peripheral arterial disease, impaired left ventricular function (LVEF ≤ 50%), severe valvular heart disease, pathologies known to affect SII index as; evidence of acute or chronic infection, systemic inflammatory or autoimmune disease, history of glucocorticoid therapy within the past 3 months, recent trauma, recent major surgery, active malignancy, thyroid gland disorders, hematological diseases, severe liver or renal failure were excluded.

The sample size calculation was done by G*Power 3.1.9.2 (Universitat Kiel, Germany). The sample size was based on the following: 90% power, 95% confidence limit, correlation coefficient (r) between SII and syntax score was 0.630 according to a previous study [9] and (r) null hypothesis is 0.4. Thirteen cases were added to overcome dropout during follow-up. Therefore, 100 patients needed to be recruited for the study. All patients undergoing elective coronary angiography for stable CAD were evaluated by history taking, clinical and laboratory evaluation to ensure the justification of inclusion and exclusion criteria. Written medical consent was obtained from patients recruited to the study sample. Samples for complete blood count (CBC), international normalized ratio (INR), renal function tests were collected. Echocardiographic assessment of all the included patients was performed by an experienced echocardiographer. SII was calculated using the formula; [SII= platelets count* neutrophil/lymphocyte ratio (NLR)] at the time of patient recruitment to the study. Patients were classified into 3 groups according to their mean SII index value: lower, intermediate and higher SII value terciles.

Angiographic assessment was done at the same day of elective coronary angiography and data was interpreted by two, blinded, interventional cardiologists. SYNTAX score was calculated upon the results of coronary angiography by the certified online SYNTAX score tool (Boston scientific, version: 2.28), Statistical analysis was done by SPSS v27 (IBM©, Chicago, IL, USA). Shapiro-Wilks test and histograms were used to evaluate the normality of the distribution of data. Quantitative parametric data were presented as mean and standard deviation (SD) and were analyzed by ANOVA (F) test with post hoc test (Tukey).

Quantitative non-parametric data were presented as Median and interquartile range

(IQR) and were analyzed by Kruskal-Walli's test with adjusted Bonferroni correction test to compare each group. Qualitative variables were presented as frequency and percentage (%) and were analyzed utilizing the Chi-square test. Correlation between various variables was done using Pearson moment correlation equation for linear relation of normally distributed variables a two tailed P value < 0.05 was considered statistically significant.

Results

This study included 113 patients undergoing elective coronary angiography divided into three groups according to SII: lower SII group (n=64), intermediate SII group (n=30), high SII group (n=19). No statistically significant different were observed among the studied group regarding age, gender, DM, HTN, smoking, family history, dyslipidemia, and main presentation as described at table (1).

No statistically significant differences were observed regarding total leucocytic count and hemoglobin, while platelets, neutrophils and lymphocytes were significantly different among the three groups (P value <0.001). Platelets and neutrophils were significantly higher in intermediate SII group and High SII group compared to Lower SII group (P value <0.05) while no statistically significant differences were observed between intermediate SII group and High SII group. Meanwhile lymphocytes were significantly lower in High SII group compared to those in Low and intermediate SII group while no statistically significant difference was observed between low and intermediate SII group (Table 2). No statistically significances different were observed regarding ECG changes, LV systolic and diastolic dysfunction or presence of SWMA among the studied groups (Table: 3)

No statically significant differences were observed between groups except for left main lesion which was higher in high SII group and lower in lower SII group (P value <0.001) (table 3). None of the studied cases had coronaries with intramyocardial course (bridge) or coronary ectasia / aneurysm (CEA). Syntax score was significantly different among the three groups being higher in intermediate SII group and High SII group compared to Lower SII group (P value=0.004 and <0.001 respectively) while no statistically significant different was observed when comparing intermediate SII group and High SII group (table 3, Figure 1).

There was a moderate positive correlation between syntax score and SII (r=0.5) (P value <0.001) (Figure 2). When univariate regression was done using parameters of age, gender, DM, HTN, smoking, family history, dyslipidemia, hemoglobin, SII, EF, SWMA and diastolic dysfunction for detection of the most independent predictors for low and high syntax score. SII was the most independent predictors for low syntax score (P value <0.001) and high SYNTAX score (P value <0.001) (Table 4).

Using ROC analysis, SII can significantly predict low syntax score (P <0.001 and AUC = 0.785) at cut-off ≤893 with 63.27% sensitivity, 85.94% specificity, 77.5% PPV and 75.3% NPV (P-value <0.001). SII can also significantly predict high syntax score (P <0.001 and AUC = 0.801) at cut-off >975 with 88.89% sensitivity, 61.05% specificity, 30.2% PPV and 96.7% NPV (P-value<0.001) (Figure 3).

Table (1): Patients' demographics and clinical characteristics of the studied groups

		Lower SII group (n=64)	intermediate SII group (n=30)	High SII group (n=19)	P value
SII (x10^3)	**Mean ± SD**	767.6 ± 174.6	1176.2±138.1	1689.4 ± 321.6	
	Range	430 - 994	995 - 1408	1409 - 2597	
Age (years)	**Mean ± SD**	60.1 ± 8.6	61.4 ± 8.7	62.6 ± 7.8	0.2
	Range	33 - 73	40 - 75	45 - 78	
Gender	**Male**	45 (70.3%)	21 (70%)	12 (63.2%)	0.8
	Female	19 (29.7%)	9 (30%)	7 (36.8%)	
DM		47 (73.4%)	26 (86.7%)	17 (89.5%)	0.2
HTN		41 (64.1%)	23 (76.7%)	17 (89.5%)	0.1
Smoking		39 (60.9%)	19 (63.3%)	13 (68.4%)	0.8
Positive Family history		8 (12.5%)	6 (20%)	3 (15.8%)	0.6
Dyslipidemia		55 (85.9%)	28 (93.3%)	17 (89.5%)	0.6
Main presentation	**Chest pain**	53 (82.8%)	20 (66.7%)	17 (89.5%)	0.1
	Dyspnea and chest pain	11 (17.2%)	10 (33.3%)	2 (10.5%)	

*: significant as P value ≤0.05; HTN, Hypertension; DM, Diabetes mellitus; SII, Systemic immune-inflammation index.

Table (2): CBC, ECG and ECHO of the studied groups

			Lower SII group (n=64)	Intermediate SII group (n=30)	High SII group (n=19)	P value	Post hock
Total leucocytic count (*109/L)		**Mean ± SD**	8.2 ± 1.8	8.6 ± 1.5	8.6 ± 1.3	0.2	
		Range	4 - 11	5.8 - 11	6 - 10		
Neutrophils (*10^3/µL)		**Mean ± SD**	3.1 ± 1.2	3.8 ± 1.1	3.9 ± 0.8	**<0.001***	**P1=0.008*** **P2=0.02*** **P3**=0.9
		Range	1.3 - 6.5	1.5 - 6.6	2.4 - 5.8		
Lymphocytes (*10^3/µL)		**Mean ± SD**	1 ± 0.4	1 ± 0.3	0.8 ± 0.2	**<0.001***	**P1**=0.9 **P2=0.01*** **P3**=0.1
		Range	0.4 - 2.1	0.4 - 1.6	0.5 - 1.2		
Hemoglobin (gm/dL)		**Mean ± SD**	12.6 ± 1.4	12.7 ± 1.3	12.8 ± 1.4	0.7	
		Range	10 - 15	10 - 15	10 - 15		
Platelets (*10^3/µL)		**Mean ± SD**	258.8 ± 58.7	318.6 ± 61.2	348.8 ± 50.1	**<0.001***	**P1<0.001*** **P2<0.001*** **P3**=0.2
		Range	144 - 410	205 - 424	278 - 432		
ECG	**Not specific**		5 (7.81%)	0 (0%)	0 (0%)	0.1	
	ST depression		38 (60.3%)	22 (75.9%)	16 (88.9%)		
	T wave change		21 (32.8%)	8 (26.7%)	3 (15.8%)		
ECHO	**Diastolic dysfunction**	**Grade 1**	61 (95.3%)	29 (96.7%)	18 (94.7%)	0.9	
		No	3 (4.7%)	1 (3.3%)	1 (5.3%)		
	SWMA	**Yes**	55 (85.9%)	27 (90%)	18 (94.7%)	0.5	
		No	9 (14.1%)	3 (10%)	1 (5.26%)		
	EF (%)	**Mean ± SD**	58 ± 3.7	58.5 ± 4.1	57.4 ± 3.9	0.3	
		Range	52 - 69	53 - 68	54 - 65		

*: significant as P value ≤0.05. **P1:** P value between Lower SII group and intermediate SII group, **P2:** P value between Lower SII group and High SII group**, P3:** P value between intermediate SII group and High SII group. **WBCs:** White blood cells. **SWMA:** Segmental wall motion abnormality, **EF:** Ejection fraction, **ECG:** Electrocardiogram. **SII:** Systemic immune-inflammation index. **CBC:** Complete blood count, **ECHO**: Echocardiogram, **ECG:** Electrocardiogram.

Table (3): CA lesions of the studied groups

		Lower SII group (n=64)	intermediate SII group (n=30)	High SII group (n=19)	P value
CA lesions	LM	3 (4.7%)	6 (20%)	11 (57.9%)	<0.001*
	LAD	62 (96.9%)	29 (96.7%)	19 (100%)	0.7
	D1	2 (3.1%)	2 (6.7%)	1 (5.3%)	0.7
	LCX	28 (43.7%)	18 (60%)	12 (63.2%)	0.2
	OM1	8 (12.5%)	2 (6.7%)	0 (0%)	0.2
	Ramus	2 (3.1%)	2 (6.7%)	1 (5.3%)	0.7
	RCA	32 (50%)	19 (63.3%)	12 (63.2%)	0.4
Syntax score	Median	20	28.5	30	<0.001*
	IQR	11.7 - 27	22.25 - 31.9	26.5 - 36	

SII: Systemic immune-inflammation index**. LAD:** Left anterior descending artery**, LCX:** Left circumflex artery**, RCA:** Right coronary artery**, OM1**: first obtuse marginal**, LM:** left main coronary artery**, D1:** First diagonal**.**

Table (4): Univariate regression of SII to predict low (<23) and high (>32) syntax score

	Univariate regression of low SYNTAX score			Univariate regression of low SYNTAX score		
	Odds ratio	95% CI	P value	Odds ratio	95% CI	P value
Age	0.9	0.9 to 1	0.3	1.0	0.9 to 1.1	0.3
Gender	0.9	0.4 to 2.1	0.9	0.8	0.3 to 2.5	0.7
DM	2.4	0.9 to 6.2	0.1	0.5	0.1 to 1.9	0.3
HTN	1.7	0.7 to 3.9	0.2	0.7	0.2 to 2.4	0.6
Smoking	0.9	0.4 to 2.1	0.9	0.7	0.2 to 2.2	0.5
Family history	0.5	0.2 to 1.5	0.2	3.4	0.8 to 13.5	0.1
Dyslipidemia	5.2	1.3 to 20.1	0.4	0.5	0.1 to 2.5	0.4
Hemoglobin	0.9	0.7 to 1.3	0.8	0.8	0.5 to 1.2	0.3
SII	0.9	0.9 to 0.9	<0.001*	1.0	1.0 to 1.0	<0.001*
EF	1.1	0.9 to 1.1	0.7	0.9	0.8 to 1.0	0.3
SWMA	0.3	0.1 to 1.1	0.1	0.3	0.03 to 2.2	0.2
Diastolic dysfunction	2.1	0.3 to 12.6	0.5	0.9	0.1 to 9.3	0.9

*Significant as P value≤0.05, **CI:** Confidence interval**. DM,** Diabetes mellitus; **HTN,** hypertension; **SII,** systemic immune inflammatory index; **EF,** ejection fraction; **SWMA,** segmental wall motion abnormality

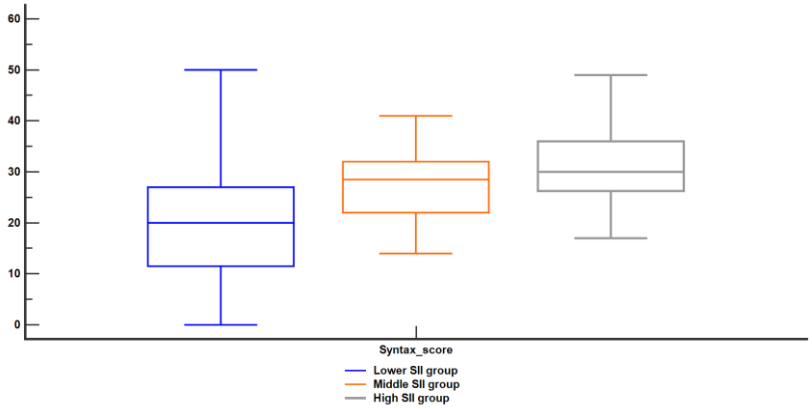


Figure (1): Syntax score of the studied groups.

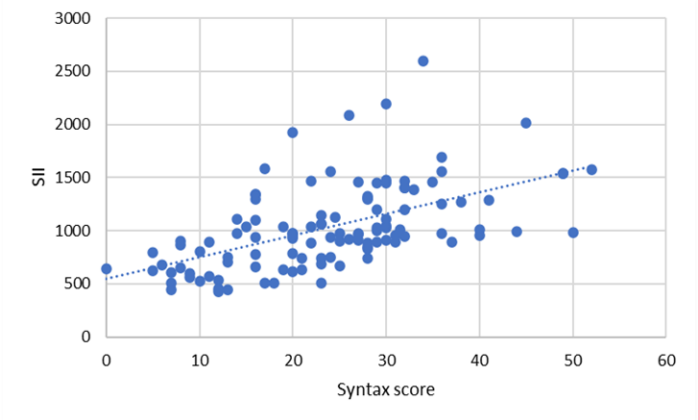


Figure (2): Correlation between syntax score and SII of the studied groups.

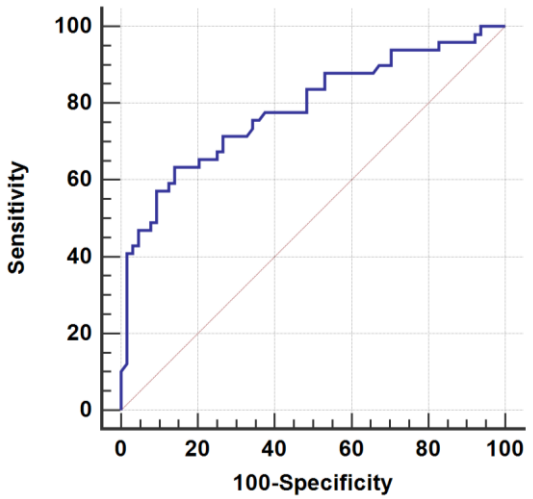
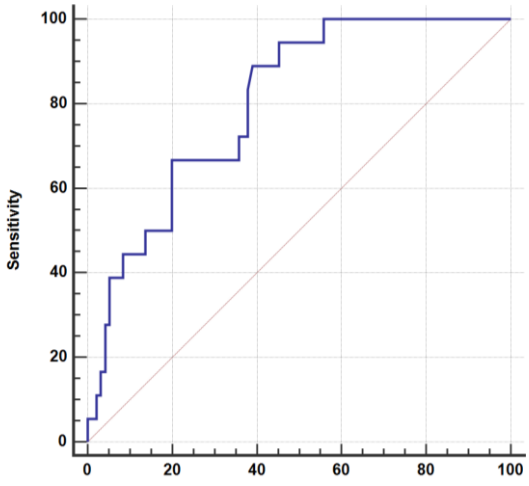


Figure (3): (a) ROC curve of SII in prediction of low SYNTAX score



(b) ROC curve of SII in prediction of high SYNTAX score

Discussion

Systemic immune inflammatory index, which is known to be a parameter that reflects the balance between the host systemic immune response and inflammation, was suggested as a prognostic tool for many diseases including atherosclerosis[10]. Because inflammation and systemic immune response are known as important two mechanisms of Atheros-

lerosis, Numerous studies explained the role of this inflammatory process as an underlying cause of development of CAD. This chronic inflammatory condition involves the accumulation of lipid deposits, immune cells, and fibrous tissue within the arterial walls forming atherosclerotic plaques which can undergo a series of complex events, including rupture or erosion, leading to the formation of thrombi and obstruction of coronary arteries, ultimately causing CAD and its related complications like myocardial infarction[11]. The differential leucocytic count and platelets count were thoroughly studied as inflammatory markers and predictors of stable coronary artery disease (SCAD). Chen et al., demonstrated significant increases in the frequencies and counts of all monocytes, immature granulocytes, and B-lymphocytes in CAD patients. They suggested those levels as potential biomarkers for diagnosis of CAD [12]. Sari et al., used both Gensini and SYNTAX scores for the evaluation of coronary lesions and correlated both scores to NLR and platelet-to-lymphocyte ratio (PLR).

They recruited 180 participants to study who underwent elective coronary angiography. They reported significant correlation between NLR and PLR and SCAD compared to patients with normal coronaries. Moreover, NLR and PLR were correlated with severity of CAD with NLR value of 2.3 or higher that could be considered as an independent predictor of CAD[13]. Using Gensini score only, Uysal et al., recruited 194 patients who had undergone coronary angiography including 42 patients with normal coronary arteries. Patients with abnormal angiography were divided into two groups according to their Gensini scores. They reported a positive correlation between NLR and extent of SCAD. NLR predicted severe atherosclerosis (sensitivity = 74% and specificity = 53%). Moreover, they reported a positive correlation between mean platelet volume (MPV) and severity of CAD [14]. Setiawan et al., studied the correlation between Leucocyte count, NLR and CRP and the extent of CAD with a cross-sectional study including 35 patients with SCAD and reported a similar result of strong positive correlation between only NLR and stenosis degree in SCAD (quantified using Gensini score) which could be considered as a marker for high-risk patient with SCAD. On the other hand, Their study failed to demonstrate significant correlation between total leucocytic count and CRP and degree of SCAD [15].

On larger scale, Verdoia et al., included a cohort of 3738 patients undergoing elective coronary angiography and divided them into quartiles according to value of NLR. They found that NLR was independently associated with the prevalence and extent of CAD and correlated with higher complexity of the coronary plaques including calcified lesions, intracoronary thrombosis, and stenosis. But they didn't depend on scoring system to evaluate coronary lesions. They only classified lesions into patients with significant CAD (with at least 1 coronary stenosis >50%), and patients with severe CAD (with a 3-vessel disease and/or left main disease) [16]. Recently, Nepal et al., classified a sample of 147 patients according to their SYNTAX score into 3 groups; low, intermediate, and high groups and correlated these groups to NLR and neutrophil count. They reported NLR as independent predictor of a high SYNTAX score. Moreover, NLR of 1.785 or higher was suggested to predicted CAD with a sensitivity of 97.4% and specificity of 83.3% [17]. Candemir et al., used SYNTAX score to evaluate coronary lesions and classified the patients according to these results into 3 groups: SYNTAX < 22, SYNTAX = 22-32, and SYNTAX > 32. Based on the results of 669 patients, they demonstrated the association of increased SII and higher SYNTAX score.

Moreover, an increased SII, together with age, NLR, and PLR, was reported as an independent predictor of CAD. Also, the SII was also significantly correlated with the SYNTAX score [9]. SII, as well as PLR, platelet, and CRP were also found to be independently associated with one-year MACEs in patients with a known diagnosis

of CAD undergoing carotid artery stenting (CAS). SII had better and sufficient discrimination power than other inflammatory parameters in predicting MACCEs in CAS[18]. Moreover, post-operative SII level >952 was also reported as a mortality prediction marker in diabetic patients undergoing off-pump CABG procedures with a sensitivity of 68.75% and specificity of 71.07% [19]. Lui et al., agreed with our results considering the predictive power of the SII for CAD. They recruited 395 patients who underwent coronary angiography to their study. They divided the Patients with CAD according to their Gensini score into the severe coronary stenosis group and the mild coronary stenosis group. The AUC of the SII in predicting CAD was greater than that of the neutrophil count, NLR, PLR, CRP level, and neutrophil count in predicting severe CAD. But they recommended a different cutoff value of the SII = 439.44 to have the highest predictive power of CAD with a sensitivity and specificity of 64.6 and 68.2%, respectively [20]. Recently, Xu et al., included a very large cohort of 84,645 patients with CAD from the Cardiorenal Improvement II (CIN-II) study and analyzed their SII level and their glycemic state.

They also classified patients into three groups based on the SII tertiles. They reported that SII was an independent risk factor for all-cause and cardiovascular mortality in patients with CAD during a median follow-up of 4.47 years. Moreover, The high SII group showed 1.69-fold and 2.29-fold increases in the risk of all-cause and cardiovascular mortality in DM patients, respectively [21]. Mangalesh et al., conducted a cross-sectional study on patients with ACS. They used SYNTAX score for evaluation of CAD and classified the patients to 3 groups: mild (<16), moderate (16-22), and severe (>22) CAD groups. SII was reported as independent predictor of CAD severity after adjusting for pertinent covariates. Not only a predictor, but also SII demonstrated the highest AUC among other predictors. The optimal cut-off of SII in their study was 4.3 $\times 10^5$ to predict severe CAD, represented by a SYNTAX score >22 [22] .Using different methods to quantify coronary lesions in patients with stable CAD, Erdogan et al., considered functional flow reserve (FFR) as a quantification tool of CAD lesions. They have investigated the predictive capacity of SII, NLR, and PLR to determine a hemodynamically significant CAD lesions assessed by FFR. Their results were suggesting that high SII levels independently increased the probability of a functionally severe lesion by 5.7 times. Furthermore, SII was superior to NLR and PLR for the prediction of hemodynamically significant CAD [23]. Xie et al., used an artificial intelligence technology and non-invasive quantitative flow ratio (QFR) method which became one ideal surrogate measure for FFR to quantify coronary lesions [24]. Xie et al., used a cut-off QFR value ≤ 0.80 to consider coronary lesions as functionally significant. They reported that SII, NLR, MLR, but not PLR, were significantly associated with severity of CAD detected by QFR in SCAD patients[25] Using both Gensini and SYNTAX Scores, Peng et al., reported SII as an independent predictor of CAD[26]. a large-scale prospective cohort study including 13,929 participants who were divided into four groups according to SII quartiles by Xu et al., reported unexpected results. They did not observe significant associations between SII and CAD or ACS despite reporting a significant correlation between SII and incidence of cerebrovascular stroke. This could be explained by the different inflammatory pathways that are linking SII to ACS or CAD which are different from those pathways that link SII to stroke. Moreover, SII could be related only to development of CAD not to the incidence of ACS [27].

Moreover, The Coronary Artery Surgery Study Class (CASSC) study correlated the severity of CAD assessed by CASSC and the diagnosis of SCAD versus ACS to SII and reported higher SII in patients with STEMI, NSTEMI and UA compared to those with SCAD. Moreover, the highest values of SII were observed for patients with the highest stage of CAD (CASSC = 3) in comparison to those with (CASSC =

0–2)[28]. In patients undergoing primary PCI, Altunova et al., evaluated 512 patients after primary PCI with residual SYNTAX score (RSS) and correlated their results with SII values. They reported SII as an independent predictor of increased RSS [29]. Not only detecting obstructive coronary lesions, SII is also thought to be a good contributor to the prediction of cardiac syndrome X (CSX) disease; those with history of chest pain, ischemic exercise ECG responses, and normal coronary angiography. In an interesting study on patients with CSX and positive MPI results, Akın et al., reported that SII is a parameter that can predict CSX disease compared to healthy controls. To predict the presence of CSX, the SII threshold at admission was 582 with 82% sensitivity and 84% specificity[30].

After different types of interventions including coronary and carotid interventions, SII was found to have a role predicting short- and long-term results. A large cohort including 5602 CAD patients were analyzed by Yang et al., and divided into two groups according to SII: high SII vs. low SII. Long-term outcomes including MACE was considered as a primary outcome while a composite of MACE and hospitalization for congestive heart failure was considered as a secondary outcome. They reported that SII was a better predictive tool of MACE than traditional risk factors in CAD patients after coronary intervention [31].

Moreover, Li et al., also evaluated SCAD patient undergoing coronary interventions considering MACE as the primary endpoint and re-admission for congestive heart failure HF as a secondary outcome. They classified the patients accordingly into 2 groups: high (>247) and low (<247) SII. The high SII was an independent predictor associated with MACE after controlling for all independent predictors. Moreover, it was associated with increased readmission for congestive HF, repeated coronary revascularization, and secondary end events. Additionally, the addition of SII to traditional risk factors improved the predictive power of MACEs by 0.135. They suggested that combining SII with traditional risk factors is superior to conventional risk factors alone in predicting adverse cardiovascular prognosis in patients with initially diagnosed CAD [32]. Finally, in most of the published studies, SII was found to be significantly correlated with SCAD. It is considered a strong predictor of CAD and correlated with results of both Gensini and SYNTAX scores in most of the published literature. Not only in SCAD patients, SII was correlated with SYNTAX score results in patients undergoing primary PCI after ACS. SII was a good predictor of cardiac syndrome X and could predict long- and short-term results after PCI.

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