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PREDICTIVE VALUE OF THE SYSTEMIC IMMUNE-INFLAMMATION INDEX AND RESIDUAL SYNTAX SCORE FOR MAJOR ADVERSE CARDIOVASCULAR EVENTS FOLLOWING PERCUTANEOUS CORONARY INTERVENTION AT AL-KINDY TEACHING HOSPITAL, BAGHDAD

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ABSTRACT

Background: Major adverse cardiovascular events (MACE) remain an important cause of morbidity and mortality following percutaneous coronary intervention (PCI). The Systemic Immune-Inflammation Index (SII) and Residual SYNTAX Score (rSS) have emerged as promising prognostic markers in patients undergoing PCI. **Aims:** To evaluate the predictive value of the Systemic Immune-Inflammation Index and Residual SYNTAX Score for major adverse cardiovascular events following percutaneous coronary intervention at Al-Kindy Teaching Hospital, Baghdad. Patients and **Methods:** This retrospective cohort study included 113 patients who underwent PCI at Al-Kindy Teaching Hospital between February 2023 and May 2026. Demographic, clinical, laboratory, angiographic, and procedural data were collected. The Systemic Immune-Inflammation Index was calculated using platelet, neutrophil, and lymphocyte counts, while the Residual SYNTAX Score was determined after PCI. Major adverse cardiovascular events, including cardiac death, nonfatal myocardial infarction, stroke, repeat revascularization, and hospitalization for heart failure, were recorded during follow-up. Receiver operating characteristic curve analysis and multivariate logistic regression analysis were performed to evaluate the predictive value of the studied parameters. **Results:** The mean age of the study population was 59.3 ± 10.8 years, and 71.7% of patients were male. Major adverse cardiovascular events occurred in 24 patients (21.2%) during follow-up. Patients who developed MACE had significantly higher mean SII values than those without adverse outcomes (1124.3 ± 402.1 versus 729.8 ± 285.6, $P < 0.001$). Similarly, the residual SYNTAX score was significantly higher among patients with MACE (9.1 ± 4.8 versus 4.9 ± 3.2, $P < 0.001$). Receiver operating characteristic analysis demonstrated that SII predicted MACE with an area under the curve (AUC) of 0.78, whereas residual SYNTAX score demonstrated an AUC of 0.82. The combined model of SII and residual SYNTAX score yielded the highest predictive accuracy with an AUC of 0.87. Multivariate logistic regression analysis identified elevated SII (OR = 2.84, 95% CI: 1.45–5.56, $P = 0.002$) and higher residual SYNTAX score (OR = 3.27, 95% CI: 1.72–6.23, $P < 0.001$) as independent predictors of major adverse cardiovascular events. **Conclusions:** The Systemic Immune-Inflammation Index and Residual SYNTAX Score are significant independent predictors of major adverse cardiovascular events following percutaneous coronary intervention. The combined use of these parameters provides superior prognostic accuracy compared with either marker alone and may represent a valuable strategy for comprehensive cardiovascular risk stratification in patients undergoing PCI.

KEYWORDS: Major Adverse Cardiovascular Events; Percutaneous Coronary Intervention; Residual SYNTAX Score; Systemic Immune-Inflammation Index.

1-INTRODUCTION

Cardiovascular disease remains the leading cause of morbidity and mortality worldwide, with coronary artery disease (CAD) accounting for the majority of cardiovascular deaths. Despite significant advances in preventive and therapeutic strategies, CAD continues to impose a substantial burden on healthcare systems globally. Percutaneous coronary intervention (PCI) has become the cornerstone of revascularization therapy for patients with acute and chronic coronary syndromes, resulting in improved survival and quality of life. However, a considerable proportion of patients undergoing PCI still experience major adverse cardiovascular events (MACE), including cardiac death, myocardial infarction, stroke, repeat revascularization, and hospitalization for heart failure.[1-2]

The occurrence of MACE after PCI is influenced by multiple factors, including patient characteristics, inflammatory status, procedural variables, and the anatomical complexity of coronary artery disease. Consequently, the identification of reliable predictors for adverse cardiovascular outcomes remains an important objective in contemporary interventional cardiology. Effective risk stratification enables clinicians to identify high-risk patients, optimize therapeutic strategies, and improve long-term clinical outcomes.[2,3]

Inflammation plays a central role in the pathogenesis of atherosclerosis, plaque instability, thrombosis, and myocardial injury. Recently, increasing attention has been directed toward inflammatory biomarkers as predictors of cardiovascular outcomes. The Systemic Immune-Inflammation Index (SII), calculated by multiplying the platelet count by the neutrophil count and dividing by the lymphocyte count, has emerged as a novel and comprehensive biomarker reflecting both inflammatory and immune responses. Elevated SII levels have been associated with increased vascular inflammation, endothelial dysfunction, plaque vulnerability, and thrombotic complications.[4,5]

Several recent studies have demonstrated the prognostic significance of SII in patients with coronary artery disease undergoing PCI. A recent meta-analysis involving more than 11,000 patients undergoing PCI demonstrated that elevated SII was associated with a significantly increased risk of major adverse cardiovascular events, all-cause mortality, heart failure, and recurrent myocardial infarction. Furthermore, SII has been shown to independently predict adverse outcomes in patients with acute coronary syndromes, particularly those undergoing primary PCI for ST-segment elevation myocardial infarction.[5,6]

Besides inflammatory status, the anatomical burden and complexity of residual coronary artery disease following revascularization have a substantial impact on clinical outcomes. The SYNTAX score was initially developed as an angiographic tool to quantify the extent and complexity of coronary artery disease. Subsequently, the Residual SYNTAX Score (rSS) was introduced to assess the amount of residual coronary disease remaining after PCI, thereby providing an objective measure of the completeness of revascularization.[7,8]

Numerous studies have demonstrated that patients with higher residual SYNTAX scores experience significantly increased rates of mortality, recurrent myocardial infarction, repeat revascularization, and major adverse cardiovascular events compared with patients who achieve complete revascularization. The residual SYNTAX score has therefore become an important prognostic marker and a valuable tool for risk stratification after PCI.[7,9]

Recent evidence suggests that combining inflammatory biomarkers with angiographic risk scores may provide superior prognostic information compared with either approach alone. The integration of biological and anatomical parameters may offer a more comprehensive assessment of patient risk and facilitate individualized management strategies. Nevertheless, studies investigating the combined predictive value of the Systemic Immune-Inflammation Index and Residual SYNTAX Score remain limited, particularly among Middle Eastern populations and within Iraqi clinical settings.[5,8,10] Therefore, the present study aims to evaluate the predictive value of the Systemic Immune-Inflammation Index and Residual SYNTAX Score for major adverse cardiovascular events following percutaneous coronary intervention among patients treated at Al-Kindy Teaching Hospital, Baghdad. The findings of this study may contribute to improving risk stratification models and optimizing clinical decision-making in patients undergoing coronary intervention.

2- PATIENTS AND METHODS

This retrospective cohort study was conducted at the Cardiac Catheterization Unit of Al-Kindy Teaching Hospital, Baghdad, Iraq, during the period from February 2023 to May 2026. Ethical approval was obtained from the Scientific and Ethical Committee of Rusafa Health Directorate before commencement of the study. Patient confidentiality was maintained throughout the study by using anonymous data collection forms, and all collected information was utilized solely for scientific research purposes.

A total of 113 consecutive patients who underwent PCI during the study period were included in the study. Patients were identified through the catheterization laboratory registry and hospital medical records. Eligible participants were adults aged 18 years and above who underwent PCI for either acute coronary syndrome or chronic coronary syndrome and had complete clinical, laboratory, angiographic, and follow-up data available for analysis. Patients with active infection, chronic inflammatory diseases, autoimmune disorders, malignancies, severe hepatic dysfunction, end-stage renal

disease requiring dialysis, recent major surgery or trauma, or incomplete medical records were excluded from the study.

Demographic and clinical data were obtained from patients' medical records and included age, sex, body mass index, smoking status, hypertension, diabetes mellitus, dyslipidemia, history of previous myocardial infarction, previous percutaneous coronary intervention, and left ventricular ejection fraction. Laboratory investigations performed at hospital admission included complete blood count, serum creatinine, fasting blood glucose, lipid profile, and cardiac biomarkers. The Systemic Immune-Inflammation Index was calculated using the formula: platelet count × neutrophil count divided by lymphocyte count.

Coronary angiography and PCI procedures were performed according to current international guidelines and institutional protocols. The baseline SYNTAX score and Residual SYNTAX Score were calculated using the validated SYNTAX score algorithm by experienced interventional cardiologists. The Residual SYNTAX Score represented the burden of residual coronary artery disease after completion of PCI. Procedural characteristics including target vessel, number of diseased vessels, number of implanted stents, stent dimensions, and procedural success were documented.

The primary study outcome was the occurrence of major adverse cardiovascular events during the follow-up period. Major adverse cardiovascular events were defined as a composite endpoint including cardiac death, nonfatal myocardial infarction, stroke, repeat coronary revascularization, and hospitalization due to heart failure.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) software version 31. Continuous variables were expressed as mean ± standard deviation or median with interquartile range, whereas categorical variables were presented as frequencies and percentages. Comparisons between groups were performed using the independent samples t-test or Mann-Whitney U test for continuous variables and the chi-square test or Fisher's exact test for categorical variables, as appropriate. Receiver operating characteristic curve analysis was used to assess the predictive value of the Systemic Immune-Inflammation Index and Residual SYNTAX Score for major adverse cardiovascular events. Univariate and multivariate logistic regression analyses were conducted to identify independent predictors of adverse outcomes. A P value of less than 0.05 was considered statistically significant.

3- RESULTS

The study included 113 patients undergoing PCI with a mean age of 59.3 ± 10.8 years. Male patients constituted the majority of the cohort (71.7%). Hypertension was the most frequently encountered cardiovascular risk factor, affecting (65.5%) of patients, followed by dyslipidemia (51.3%), diabetes mellitus (41.6%), and current smoking (37.2%). Previous myocardial infarction and prior percutaneous coronary intervention were reported in (24.8%) and (18.6%) of patients, respectively. The mean left ventricular ejection fraction was 48.6 ± 8.7%, indicating mildly impaired systolic function among the studied population.

Table 3.1: Baseline demographic and clinical characteristics of the study population (n = 113).

Variable	Value
Age (years), mean ± SD	59.3 ± 10.8
Male sex, n (%)	81 (71.7)
Female sex, n (%)	32 (28.3)
Hypertension, n (%)	74 (65.5)
Diabetes mellitus, n (%)	47 (41.6)
Dyslipidemia, n (%)	58 (51.3)
Current smoking, n (%)	42 (37.2)
Previous MI, n (%)	28 (24.8)
Previous PCI, n (%)	21 (18.6)
LVEF (%), mean ± SD	48.6 ± 8.7

Table 3.2 demonstrates the clinical presentation of patients who underwent percutaneous coronary intervention. ST-segment elevation myocardial infarction represented the most common clinical indication for intervention, accounting for (45.1%) of cases, highlighting the substantial burden of acute coronary syndromes within the study population. Non-ST-segment elevation myocardial infarction constituted (25.7%) of patients, while unstable angina accounted for (15.9%). Patients with chronic coronary syndrome represented the smallest subgroup, comprising (13.3%) of the total cohort.

Table 3.2: Clinical presentation of patients undergoing PCI.

Clinical presentation	Number (%)
STEMI	51 (45.1)
NSTEMI	29 (25.7)
Unstable angina	18 (15.9)
Chronic coronary syndrome	15 (13.3)
Total	113 (100)

Table 3.3 presents the angiographic and procedural characteristics of the study population. Multivessel coronary artery disease was common, with (37.2%) and (32.7%) of patients exhibiting double-vessel and triple-vessel disease, respectively. Single-vessel disease was identified in (30.1%) of cases. The mean baseline SYNTAX score was 21.4 ± 8.7, reflecting moderate angiographic complexity of coronary artery disease. Following PCI, the mean residual SYNTAX score decreased to 5.8 ± 4.3, indicating a substantial reduction in residual coronary disease burden. Complete revascularization was achieved in (33.6%) of patients, whereas incomplete revascularization remained present in (66.4%). The average number of implanted stents was

1.8 ± 0.7, demonstrating that multiple lesions frequently required intervention in this patient population.

Table 3.3: Angiographic and procedural characteristics.

Variable	Value
Single-vessel disease	34 (30.1)
Double-vessel disease	42 (37.2)
Triple-vessel disease	37 (32.7)
Baseline SYNTAX score	21.4 ± 8.7
Residual SYNTAX score	5.8 ± 4.3
Complete revascularization	38 (33.6)
Incomplete revascularization	75 (66.4)
Number of implanted stents	1.8 ± 0.7

Table 3.4 illustrates the distribution of the Systemic Immune-Inflammation Index among the studied patients. The mean SII value was 812.6 ± 356.4, indicating a considerable degree of systemic inflammatory activity within the cohort. The median SII value was 768, with an interquartile range of 560–1048, suggesting substantial variability among patients. The observed minimum and maximum values ranged from 215 to 1845, respectively. These findings reflect the heterogeneity of inflammatory responses in patients with coronary artery disease undergoing PCI.

Table 3.4: Systemic Immune-Inflammation Index values.

Parameter	Value
SII, mean ± SD	812.6 ± 356.4
Median SII	768
IQR	560–1048
Minimum	215
Maximum	1845

Table 3.5 summarizes the incidence of major adverse cardiovascular events during the follow-up period. Overall, MACE occurred in 24 patients, representing (21.2%) of the study population. Repeat coronary revascularization was the most frequently observed adverse event, affecting (7.1%) of patients, followed by nonfatal myocardial infarction in (5.3%) and hospitalization due to heart failure in (4.4%). Cardiac mortality occurred in (3.5%) of patients, while stroke was the least frequent complication, occurring in only one patient (0.9%).

Table 3.5: Major adverse cardiovascular events during follow-up.

Outcome	Number (%)
No MACE	89 (78.8)
MACE	24 (21.2)
Cardiac death	4 (3.5)
Nonfatal MI	6 (5.3)
Repeat revascularization	8 (7.1)
Heart failure hospitalization	5 (4.4)
Stroke	1 (0.9)

Table 3.6 compares the clinical, inflammatory, and angiographic characteristics of patients who developed major adverse cardiovascular events with those who remained free of adverse outcomes. Patients experiencing MACE were significantly older and demonstrated a higher prevalence of diabetes mellitus compared with patients without MACE. Furthermore, left ventricular ejection fraction was significantly lower among patients who experienced adverse events. The mean Systemic Immune-Inflammation Index was substantially elevated in the MACE group, indicating a stronger inflammatory response. Similarly, the residual SYNTAX score was significantly higher in patients who developed adverse outcomes, reflecting greater residual coronary artery disease burden.

Table 3.6: Comparison of patients with and without MACE.

Variable	MACE (n=24)	No MACE (n=89)	P value
Age (years)	63.5 ± 9.4	58.1 ± 10.9	**0.028**
Diabetes mellitus	15 (62.5)	32 (36.0)	**0.022**
LVEF (%)	43.2 ± 7.1	50.1 ± 8.3	**<0.001**
SII	1124.3 ± 402.1	729.8 ± 285.6	**<0.001**
Residual SYNTAX	9.1 ± 4.8	4.9 ± 3.2	**<0.001**

Table 3.7 presents the results of multivariate logistic regression analysis performed to identify independent predictors of major adverse cardiovascular events following PCI. After adjustment for potential confounding variables, elevated Systemic Immune-Inflammation Index remained a significant independent predictor of adverse cardiovascular outcomes, with an odds ratio of 2.84. Likewise, higher residual SYNTAX score independently predicted MACE, with an odds ratio of 3.27. Diabetes mellitus and reduced left ventricular ejection fraction also demonstrated significant associations with adverse outcomes.

Table 3.7: Multivariate logistic regression analysis for predictors of MACE.

Variable	Odds Ratio	95% CI	P value
Age	1.04	1.01–1.10	**0.041**
Diabetes mellitus	1.89	1.10–3.95	**0.034**
Reduced LVEF	2.35	1.32–4.74	**0.012**

Elevated SII	2.84	1.45–5.56	**0.002**
Residual SYNTAX	3.27	1.72–6.23	**<0.001**

Figure 3.1 legend: ROC curve analysis demonstrated good predictive performance for both the Systemic Immune-Inflammation Index (AUC = 0.78) and residual SYNTAX score (AUC = 0.82). The combined model (SII + residual SYNTAX score) yielded the highest predictive accuracy.

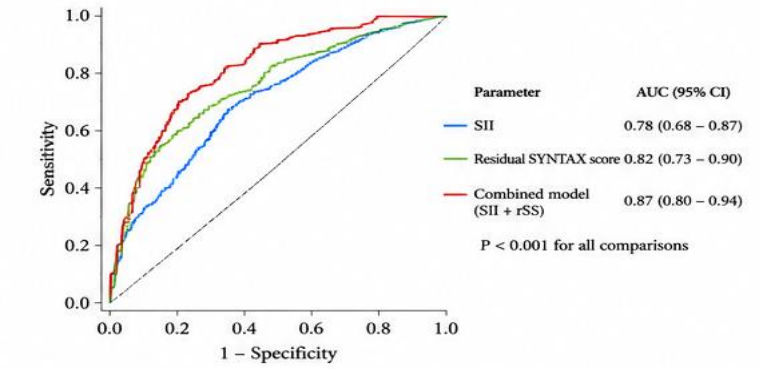

Figure 3.1: Receiver operating characteristic (ROC) curves for prediction of major adverse cardiovascular events.

4- DISCUSSION

The present study evaluated the predictive value of the SII and the rSS for MACE following PCI among patients treated at Al-Kindy Teaching Hospital, Baghdad. The principal findings of this study demonstrated that both elevated SII and higher residual SYNTAX score were independently associated with adverse cardiovascular outcomes after PCI. Furthermore, combining these two parameters resulted in superior predictive performance compared with either marker alone, suggesting that integrating inflammatory and anatomical risk assessment may improve cardiovascular risk stratification in patients undergoing coronary intervention.

The demographic characteristics of the present study population were generally comparable to those reported in previous studies of patients with coronary artery disease undergoing PCI. The mean age of the study population was 59.3 ± 10.8 years, while males constituted (71.7%) of the total cohort. These findings are consistent with the report by **Virani *et al*.**,[1], who demonstrated that coronary artery disease predominantly affects middle-aged and elderly populations and remains more prevalent among men. Furthermore, the high prevalence of hypertension, diabetes mellitus, dyslipidemia, and smoking observed in the current study is comparable to findings reported in contemporary international cardiovascular registries and reflects the increasing burden of traditional cardiovascular risk factors worldwide.[1,2]

In the present study, acute coronary syndromes represented the most common indication for PCI, with ST-segment elevation myocardial infarction accounting for (45.1%) of patients. This observation is consistent with current international guidelines that recommend early coronary revascularization as the treatment of choice in acute coronary syndromes.[2,3] The predominance of acute coronary syndromes may partly explain the elevated inflammatory burden observed in our cohort, as plaque rupture and thrombus formation are associated with activation of inflammatory and immune pathways.

One of the principal findings of the present study was the significant association between elevated Systemic Immune-Inflammation Index and major adverse cardiovascular events. Patients who developed MACE demonstrated significantly higher SII values than those without adverse outcomes (1124.3 ± 402.1 versus 729.8 ± 285.6, P < 0.001). These findings support the growing evidence indicating that inflammation plays a critical role in the development, progression, and destabilization of atherosclerotic plaques, as well as in post-procedural cardiovascular complications. The Systemic Immune-Inflammation Index integrates neutrophil, platelet, and lymphocyte counts and therefore reflects the balance between inflammatory activation and immune regulation.[4]

The findings of the present study are consistent with those reported by Yang et al. (4), who first demonstrated that elevated SII independently predicted adverse clinical outcomes in patients with coronary artery disease. Similarly, **Saylik and Akbulut**[6] reported that elevated SII was significantly associated with increased mortality, recurrent myocardial infarction, heart failure, and major cardiovascular events among patients with ST-segment elevation myocardial infarction undergoing primary PCI. Furthermore, **Zhang *et al*.**,[5] in their recent meta-analysis involving more than 11,000 patients undergoing PCI, demonstrated that elevated SII was associated with approximately a twofold increase in the risk of major adverse cardiovascular events. Likewise, **Zhao *et al*.**,[10] found that increased SII independently predicted adverse

cardiovascular outcomes among patients undergoing PCI for chronic total coronary occlusion.

Our findings are also supported by recent investigations. **Wang *et al*.**,[11] conducted a systematic review and meta-analysis and reported that elevated SII was significantly associated with increased risk of mortality and cardiovascular events among patients with acute coronary syndromes. Similarly, **Liu *et al*.**,[12] demonstrated that elevated SII independently predicted adverse outcomes in patients undergoing PCI, suggesting that systemic inflammatory burden represents an important determinant of cardiovascular prognosis.

Several mechanisms may explain the prognostic significance of SII in patients undergoing PCI. Neutrophils contribute to endothelial dysfunction, plaque instability, thrombosis, and myocardial injury through the release of inflammatory mediators and reactive oxygen species. Platelets play a central role in thrombus formation and inflammatory activation, while reduced lymphocyte counts reflect impaired immune regulation and increased physiological stress. Consequently, elevated SII represents a state of enhanced inflammation and impaired immune response, both of which contribute to adverse cardiovascular outcomes.[4,5,6,10,11]

Another important finding of the present study was the independent prognostic significance of the residual SYNTAX score. Patients who developed major adverse cardiovascular events exhibited significantly higher residual SYNTAX scores compared with patients who remained free of adverse outcomes (9.1 ± 4.8 versus 4.9 ± 3.2, $P < 0.001$). These findings indicate that residual coronary disease burden after PCI remains an important determinant of long-term cardiovascular prognosis.

The findings of the present study are consistent with those reported by **Kobayashi *et al*.**[7], who demonstrated that residual SYNTAX score independently predicted mortality and ischemic events following PCI in patients with acute coronary syndromes. Similarly, **Lin *et al*.**,[8] in their recent review, emphasized that residual SYNTAX score remains one of the strongest angiographic predictors of adverse cardiovascular outcomes following coronary intervention. Likewise, **Satheesh *et al*.**,[9] reported that elevated residual SYNTAX scores were associated with increased rates of major adverse cardiovascular events and mortality after PCI.

Recent studies have further confirmed the prognostic significance of residual coronary disease burden. **Keskin *et al*.**,[13] demonstrated that elevated residual SYNTAX scores were independently associated with increased mortality and adverse cardiovascular outcomes among elderly patients undergoing PCI. Similarly, **Samir *et al*.**[14] found that patients with residual SYNTAX scores greater than 8 experienced significantly higher rates of recurrent cardiovascular events following primary PCI.

The association between elevated residual SYNTAX score and adverse cardiovascular outcomes may be explained by several mechanisms. Residual coronary lesions continue to contribute to myocardial ischemia, endothelial dysfunction, inflammation, and recurrent plaque instability. Furthermore, incomplete revascularization may impair myocardial recovery and increase the risk of recurrent ischemic events, ventricular dysfunction, and heart failure. Therefore, complete or near-complete revascularization remains an important therapeutic objective whenever technically feasible.[2,7,8,9]

One of the most important findings of the present study was that combining Systemic Immune-Inflammation Index with residual SYNTAX score provided superior predictive performance compared with either parameter alone. Receiver operating characteristic analysis demonstrated that the combined model achieved an area under the curve of 0.87, compared with 0.78 for SII alone and 0.82 for residual SYNTAX score alone. These findings suggest that inflammatory status and anatomical coronary disease burden contribute independently and synergistically to cardiovascular prognosis.

The superiority of combined inflammatory and angiographic assessment observed in the present study is supported by recent evidence. **Chen *et al*.**,[15] demonstrated that integrating inflammatory biomarkers with angiographic risk scores significantly improved prognostic prediction following PCI. Similarly, **Zhang *et al*.**,[5] **Lin *et al*.**,[8] and **Zhao *et al*.**,[10] emphasized that combining biological and anatomical risk assessment provides a more comprehensive evaluation of cardiovascular risk than either approach alone.

Multivariate logistic regression analysis demonstrated that elevated SII (OR = 2.84, 95% CI: 1.45–5.56, $P = 0.002$) and higher residual SYNTAX score (OR = 3.27, 95% CI: 1.72–6.23, $P < 0.001$) remained independent predictors of major adverse cardiovascular events after adjustment for age, diabetes mellitus, and left ventricular ejection fraction. These findings indicate that inflammatory burden and residual coronary disease contribute independently to cardiovascular risk and provide additional prognostic information beyond conventional cardiovascular risk factors.

The clinical implications of the present study are considerable. Both SII and residual SYNTAX score are inexpensive, readily available, and easily calculated parameters that can be incorporated into routine clinical practice without additional cost. Early identification of patients at high risk for adverse cardiovascular outcomes may facilitate closer follow-up, optimization of pharmacological therapy, aggressive modification of cardiovascular risk factors, and consideration of complete revascularization strategies when appropriate.

The present study has several limitations. First, the study was conducted at a single tertiary referral center, which

may limit the generalizability of the findings. Second, the relatively small sample size may have reduced the statistical power of subgroup analyses. Third, the observational nature of the study precludes establishing definitive causal relationships. Finally, serial measurements of inflammatory biomarkers were not available, which might have provided additional prognostic information regarding changes in inflammatory status over time. Despite these limitations, the present study provides important evidence regarding the prognostic value of the Systemic Immune-Inflammation Index and residual SYNTAX score among Iraqi patients undergoing PCI. To the best of our knowledge, this study represents one of the few investigations evaluating the combined prognostic significance of inflammatory and angiographic risk markers in this population.

5- CONCLUSION AND RECOMMENDATION

The present study demonstrated that both the Systemic Immune-Inflammation Index and the Residual SYNTAX Score are significant independent predictors of major adverse cardiovascular events following percutaneous coronary intervention. Patients with elevated SII values and higher residual SYNTAX scores experienced significantly greater rates of adverse cardiovascular outcomes, indicating that inflammatory burden and residual coronary artery disease contribute substantially to post-PCI prognosis. Furthermore, the combination of these two parameters provided superior predictive accuracy compared with either marker alone, suggesting that integrating inflammatory and anatomical risk assessment may improve cardiovascular risk stratification in clinical practice. Based on these findings, it is recommended that the Systemic Immune-Inflammation Index and Residual SYNTAX Score be routinely assessed in patients undergoing PCI to facilitate early identification of high-risk individuals, optimize treatment strategies, and improve clinical outcomes. Additionally, larger multicenter prospective studies with longer follow-up periods are recommended to further validate the prognostic utility of these parameters and to establish standardized risk stratification models for patients undergoing coronary intervention.

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