Association between C - reactive protein to Serum Albumin Ratio with the Severity of Coronary Artery Disease in Non-ST Elevated Myocardial Infarction Patients

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ABSTRACT
Background: Non-ST-segment elevation Acute Cronary Syndrome (NSTE-ACS) stays as the most common cause of mortality in people with cronary artery disease (CAD).
Objective: The purpose of this research was to assess the probable association between the severity of CAD disease (by using the Syntax score) and c-reactive protein/albumin ratio (CAR) calculated by measuring serum levels upon admission. **Patients and Methods:** A prospective study that included 100 patients who were admitted to Agoza Hospital and Benha University Hospital with clinical features of NSTEMI and treated with percutaneous coronary intervention (PCI). We divided the patients into 2 groups: according to Syntax score, group 1 included 59 patients with Syntax score ≤ 22. Group 2 included 41 patients with Syntax score > 22. **Results:** Regarding laboratory findings in the studied patients, neutrophil was significantly higher in group 2 (7.6) than in group 1 (6) (P < 0.001). Platelets were significantly higher in group 2 (332%) than in group 1 (293) (P < 0.001). Median CRP was significantly higher in group 2 (14.8) than in group 1 (6) (P < 0.001). Median CAR was significantly higher in Group 2 (35.6) than in group 1 (14.6) (P < 0.001). Neutrophil to lymphocyte ratio (NLR) was significantly higher in group 2 (3) than in group 1 (2.5) P < 0.001). Left main cronary artery (LMCA) disease, three vessels disease (3VD), bifurcation, complete total occlusion (CTO), Lesion > 20 mm and severe tortuosity were significantly higher in group 2 than in group 1. **Conclusion:** GRS, LMCA disease, TVD, bifurcation, CTO, Lesion > 20 mm, severe tortuosity, neutrophil, platelets, median CRP, median CAR and NLR were significantly higher in those with Syntax score > 22 than those with syntax score ≤ 22. CAR was revealed to be an independent predictor for the high SS group, with a stronger correlation to the complexity and severity of CAD.
Keywords: C - reactive protein - Serum albumin ratio - Severity of coronary artery disease - Non-ST elevated myocardial infarction.

INTRODUCTION
NSTE-ACS stays as the commonest cause of mortality in people with CAD [(1)].

The most popular method of assessing CAD severity, the synergy between PCI with TAXUS and cardiac surgery Syntax score (SS), has been linked to an increased risk of mortality in patients with both ACS and stable CAD [(2)]. By identifying the risk factors for intermediate-high SS, the prognosis of NSTE-ACS patients could be better by being closely monitored before, during, and after hospitalization and referral for emergency coronary angiography and revascularization. Inflammation contributes to the worsening and instability of atherosclerotic plaques [(3)].

The inflammatory response may be assessed by acute phase reactants (APRs). CRP and serum albumin are related to the existence of CAD, increased CAD severity, and cardiovascular adverse events [(4)].

It has been proven that CAR is a stronger indicator of the inflammatory condition than either CRP or albumin alone. It has also been linked to a bad prognosis in those who are already suffering from serious illnesses like cancer [(5)]. The purpose of this study was to recognize the probable relation between the severity of coronary artery disease as determined by the syntax score and CAR, which was determined by measuring serum level of levels upon admission.

PATIENTS AND METHODS
A. Technical design:
1-Study type and region: This prospective study was done in Cardiology Department, Agoza Hospital and Benha University Hospital.

2-Study population: The study was done on 100 patients who were admitted to Agoza Hospital and Benha University Hospital with NSTEMI and were treated with PCI.

Inclusion criteria: All patients with NSTEMI e.g. patients suffering from chest pain with no persistent ST-segment elevation, with ECG showing ST segment deviation (transient elevation or persistent depression), T wave abnormality including inverted, flat or pseudo-normalization or even normal ECG [(6)].

Exclusion criteria: Patients with past history of CAD treated with PCI or CABG, patients with cancer, patients with active infection, patients with connective tissue disorders, patients with chronic kidney disease and patients with liver disease.

B. Operational design :
Initial assessment: Complete full history taking and clinical examination of all patients.

Investigations included Complete blood picture (CBC), serum creatinine and lipid profile**.** High sensitive CRP**:** (Normal: 1.0-3.0 mg/dL) [(7)]**.** Serum albumin: (range: 3.5 to 5.5 (g/dL) [(8)]**.**

1. **Cardiac biomarkers** [(9)]:
   - **Cardiac troponin I:** If the first levels of cardiac troponins that was measured at presentation are negative, serials are obtained at 3 to 6 hours after beginning of symptoms (Normal range: between 0 and 0.04 ng/mL)

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- **CK** (Normal range: 22 to 198 U/L)
- **CK-MB** (Normal range: 5 to 25 U/L).

2. C-reactive protein to serum albumin ratio:

- The levels of CRP and albumin were measured at admission.
- CAR was measured as the ratio between CRP level to the serum albumin level multiplied by 100.

Transthoracic echocardiography: Resting transthorathic echocardiography was done with special stress on RWMA and assessment of LVEF using modified Simpson method and degree of mitral regurge.

ECG : ECG was done to all patients considering ischemic changes (ST segment, T wave and Q wave) and arrhythmias.

Coronary angiography:

All patients underwent coronary angiography for CAD diagnosis, assessment by Syntax score. The Syntax score is one of the angiographic tools used for grading and assessing the severity and complexity of CAD. It has a prognostic value in CAD and helps in what strategy of revascularization would be selected.

We divided the patients into 2 groups: according to Syntax score:

- Group 1: 59 patients with Syntax score ≤ 22. Group 2: 41 patients with Syntax score > 22.

1. Dominance	
2. Number of lesions	
3. Segments involved per lesion	
Lesion characteristics	
4. Total occlusion	i. Number of segments involved ii. Age of the total occlusion (>3 months) iii. Blunt stump iv. Bridging collaterals v. First segment beyond the occlusion visible by antegrade or retrograde filling vi. Side branch involvement
5. Trifurcation	i. Number of segments diseased
6. Bifurcation	i. Type ii. Angulation between the distal main vessel and the side branch <70°
7. Aorto-ostial lesion	
8. Severe tortuosity	
9. Length >20 mm	
10. Heavy calcification	
11. Thrombus	
12. Diffuse disease/ small vessels	i. Number of segments with diffuse disease/small vessels

Syntax score calculating algorism [10]:

GRS: Could be obtained from patient history, physical examination, ECG, and lab data measured during admission. GRS is formed of 8 variables caculated at time of admission, including patient's age, systolic blood pressure, heart rate, serum creatinine, Killip class, raised cardiac enzymes, ST-segment deviation and cardiac arrest at during admission. Total score varies from 0 to 372 points **[11, 12].**

Grace score									
Age	Points	**HR**	Points	**SBP**	Points	**Cr**	Points	**Killip class**	Points
<39	0	<70	0	<80	40	0.0–0.39	1	I	0
40–49	18	70–89	5	80–99	37	0.4–0.79	4	II	15
50–59	36	90–109	10	100–119	30	0.8–1.19	7	III	29
60–69	55	110–149	17	120–139	23	1.2–159	10	IV	44
70–79	73	150–199	26	140–159	17	1.6–1.99	13	**Cardiac arrest**	30
80–89	91	≥200	34	160–199	7	2.0–3.99	21	**Elevated cardiac markers**	13
>90	100	–	–	≥200	0	≥4	28	**ST-segment deviation**	17

Low risk	1–88
Intermediate risk	89–118
High risk	≥119

Ethical consent:

The Ethical Institutional Review Board at Benha University approved the study. After explaining our research objectives, written informed consent was obtained from all study participants. This study was conducted in compliance with the code of ethics of the world medical association (Declaration of Helsinki) for human subjects.

Statistical Analysis

The following procedures were used to gather, tabulate, and statistically evaluate the data: Coding and editing, and entering the data to computer. For parametric data, standard deviation (SD) and means were used, whereas ranges and medians were used for non-parametric data. In this study, qualitative data were presented in the form of relative percentages and frequencies. Shapiro-Wilk's test was used to determine if the data followed a normal distribution. Adequate statistical tests of significance were done to the data, including: Mann-Whitney U test and t-test were employed to determine statistical significance among two groups on quantitative variables.

When comparing two dependent groups with normally distributed variables, Paired t-test is utilized. The dissimilarity between qualitative variables was determined by the use of the Chi square test and the Fisher-exact test. Potential risk factors for hypomagnesemia were identified using stepwise regression analysis. P value < 0.05 was considered significant.

RESULTS

GRS was significantly higher in group 2 (100.0) than in group 1 (92) (P = 0.002. Both groups showed no significant differences regarding other demographic parameters & risk factors **(Table 1).**

Table (1): General characteristics of the studied patients

		Total (n= 100)	Group 1 (n= 59)	Group 2 (n= 41)	P-value
Age (years)	Mean ±SD	57 ±8	57 ±8	58 ±10	0.532
Gender	Males n (%)	64 (64.0)	36 (61.0)	28 (68.3)	0.456
	Females n (%)	36 (36.0)	23 (39.0)	13 (31.7)	
Body mass index	Mean±SD	28.6 ±4.1	28.4 ±4	28.8 ±4.3	0.589
Hypertension	n (%)	60 (60.0)	34 (57.0)	26 (63.4)	0.561
Diabetes mellitus	n (%)	55 (55.0)	31 (52.0)	24 (58.5)	0.553
Dyslipidemia	n (%)	99 (99.0)	58 (98.3)	41 (100.0)	1.0
Smoking	n (%)	31 (31.0)	15 (25.4)	16 (39.0)	0.148
Family history	n (%)	27 (27.0)	19 (32.2)	8 (19.5)	0.16
CAD history	n (%)	37 (37.0)	19 (32.2)	18 (43.9)	0.233
GRS	Mean ±SD	95 ±14	92 ±12	100 ±14	0.002

There were no significant differences detected between both groups regarding LVEF (Pvalue = .358), RWMA (Pvalue = .422), and ECG (Pvalue = 0.775) **(Table 2).**

Table (2): Echo and ECG in the studied patients

			Total (n= 100)	Group 1 (n= 59)	Group 2 (n= 41)	Pvalue
LVEF	Mean ±SD		56 ±11	57 ±10	55 ±13	0.358
RWMA	n (%)		79 (79.0)	45 (76.3)	34 (82.9)	0.422
ECG	Ant ischemia	n (%)	36(36.0)	20 (33.8)	16 (39.0)	0.775
	Inf ischemia	n (%)	33 (33.0)	20 (33.9)	13 (31.7)	
	Lat ischemia	n (%)	31 (31.0)	19 (32.2)	12 (29.3)	

LMCA was significantly higher in group 2 (24.4%) than in group 1 (1.7%) (P < 0.001). Three vessels disease (3VD) was present in 9 patients in group 2 (22%) while no patient in group 1 had three vessels disease (0%) (P < 0.001). Bifurcation was significantly higher in group 2 (31.7%) than in group 1 (11.9%) (P = 0.015).

CTO was significantly higher in group 2 (29.3%) than in group 1 (8.5%) (P = 0.006). Lesion > 20 mm was significantly higher in group 2 (43.9%) than in group 1 (15.3%) (P = 0.002). Severe tortuosity was significantly higher in group 2 (31.7%) than in group 1 (13.6%) (P = 0.028). There were no significant differences detected regarding heavy calcification (P = 0.331) and thrombosis (P = 0.051) **(Table 3).**

Table (3): Angiographic characteristics in the studied patients

		Total (n= 100)	Group 1 (n= 59)	Group 2 (n= 41)	Pvalue
LMCA disease	n (%)	11 (11.0)	1 (1.7)	10 (24.4)	<0.001
3VD	n (%)	9 (9.0)	0 (0.0)	9 (22.0)	<0.001
Bifurcation	n (%)	20 (20.0)	7 (11.9)	13 (31.7)	0.015
CTO	n (%)	17 (17.0)	5 (8.5)	12 (29.3)	0.006
Lesion > 20mm	n (%)	27 (27.0)	9 (15.3)	18 (43.9)	0.002
Severe tortuosity	n (%)	21 (21.0)	8 (13.6)	13 (31.7)	0.028
Heavy calcification	n (%)	22 (22.0)	11 (18.6)	11 (26.8)	0.331
Thrombus	n (%)	22 (22.0)	9 (15.3)	13 (31.7)	0.051

Neutrophil was significantly higher in group 2 (7.6) than in group 1 (6) (P < 0.001. Platelets were significantly higher in group 2 (332%) than in group 1 (293) (P <0.001). Median CRP was significantly higher in group 2 (14.8) than in group 1 (6) (P < 0.001). Median CAR was significantly higher in group 2 (35.6) than in group 1 (14.6) (P < 0.001). NLR was significantly higher in group 2 (3) than in group 1 (2.5) (P < 0.001) **(Table 4).**

Table (4): Laboratory findings in the studied patients

		Total (n = 100)	Group 1 (n = 59)	Group 2 (n = 41)	Pvalue
Creatinine(mg/ dl)	Mean±SD	0.9 ±0.3	0.9 ±0.21	0.9 ±0.20	0.856
Neutrophil (10^3/ ul)	Mean±SD	6.6 ±1.4	6 ±1	7.6 ±1.3	<0.001
Lymphocytes(10^3/ ul)	Mean±SD	2.5±0.5	2.5 ±.5	2.6 ±.5	0.221
Platelets(10^3/ul)	Mean±SD	309 ±57	293 ±54	332 ±54	<0.001
CRP (mg/l)	Mean±SD	9 ±2.21	6 ± 1.3	14.8 ±3.2	<0.001
Albumin (g/l)	Mean±SD	41 ±5	41 ±5	42 ±5	0.239
CAR	Mean±SD	21.3 ±4.61	14.6 ±3.4	35.6 ±8.6	<0.001
NLR	Mean±SD	2.7 ±0.6	2.5 ±0.4	3 ±0.6	<0.001
PLR	Mean±SD	126.7 ±31	123.1 ±32.2	131.9 ±28.9	0.16

CAR showed a significant positive relation with GRS (r=.371 & P < 0.001), Syntax score (r=.855 & P < 0.001), neutrophil (r=.548 & P < 0.001), platelets (r = 346 & P < 0.001), NLR (r= .441 & P < 0.001), and PLR (r=.217 & P = 0.03) **(Table 5)**.

Table (5): Association between CAR and other parameters

	CAR	
	R	**Pvalue**
Age(years)	.029	.771
Body mass index	-0.01	0.92
GRS	.370*	<0.001
LVEF	-0.096	0.341
Syntax score	.855*	<0.001
Creatinine (mg/dl)	0.043	0.673
Neutrophil (10^3/ul)	.538*	<0.001
Lymphocytes (10^3/ul)	0.083	0.414
Platelets (10^3/ul)	.346*	<0.001
NLR	.441*	<0.001
PLR	.217*	0.03

ROC analysis was performed for CAR and NLR in differentiating those with Syntax scores > 22. For CAR, it showed an AUC of 0.99 with a 95%, CI ranged from 0.978 to 1 and a P < 0.001. The best cutoff point was ≤ 24.4 with 94.9% sensitivity and 95.1% specificity. For NLR, it showed AUC of 0.766; 95%, CI range 67-.862, P < 0.001. The best cutoff point was ≤ 2.7, with 76.3% sensitivity and 70.7% specificity. There was a significant difference between the two ROC curves (P < 0.001) **(figure1)**.

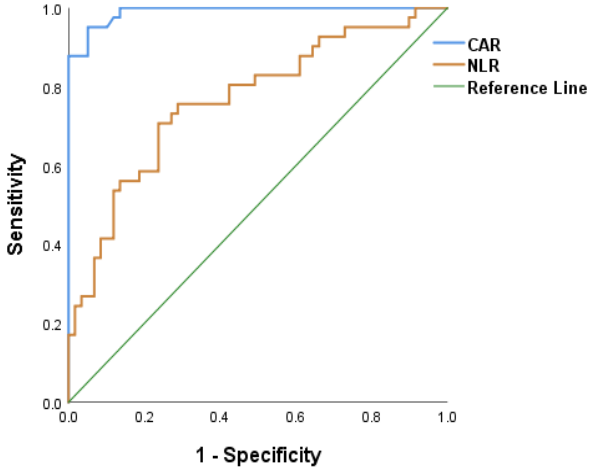

Figure (1): ROC analysis of CAR and NLR in differentiating high syntax score (>22)

Multivariate logistic regression analysis was done to predict Syntax score > 22. It revealed that CAR was a significant independent predictor (OR= 1.67 & 95%, CI=1.248 to 2.235, P = 0.001) **(Table 6)**.

Table (6): Multivariate logistic regression analysis to predict syntax score>22

	OR (95%CI)	Pvalue
GRS	1.01 (0.924 - 1.105)	0.823
Platelets (103/ul)	1.01 (0.986 - 1.034)	0.411
NLR	3.069 (0.172 - 54.886)	0.446
CAR	1.67 (1.248 - 2.235)	0.001

DISCUSSION

Our study showed that GRS was significantly higher in group 2 (100.0) than in group 1 (92). Both groups showed no significant differences regarding other demographic parameters & risk factors. **Rahmani *et al.*** [13] stated that, GRS is a reliable method for risk stratification. Patients with low Syntax had a mean GRS score of 107.13, whereas those with intermediate-high Syntax had a mean GRS score of 135.80 (p=.001). A relation was detected between GRS, Syntax scores (r = .35 p < 0.001). GRS of 109 is ideal cutoff for predicting intermediate-high Syntax with a 73.6% sensitivity and 60% specificity (p < 0.001).

Previous study by **Kurtul *et al.*** [4] investigating the relationship between blood parameters upon admission and high SX scores and death during hospital stay in ACS patients reported that patients with mean age of 61.2 years were 909, 69.8% of them were male. High SX score were associated with a number of risk factors, as advanced age, female gender, DM, a history of cvs disease, and stroke. On the other hand, according to the findings of a study that was carried out by **Çağdaş *et al.*** [14], out of 344 of the studied population who were confirmed to have NSTE-ACS (mean age of 65 ± 12 years), 36.7% (n = 126) of those patients were female patients. Study population had an average score on the SS of 17.8 ± 10. 231.

Patients who had a SS that was lower than 22 were placed in the low SS group, while 113 patients who had an SS that was equal to or more than 22 were placed in the high SS group. High SS population had a high possibility to be of advanced age, to be females, with higher incidence of diabetes and PAD than other people. In a study that was carried out by **Karabağ *et al.*** [15] out of 403 patients, (mean age of 62.52 ±11.69 years), 75.9% of those patients were male patients. The range of Syntax scrore was from 5.0 to 56, and the mean was 26.5 ± 13.3. There were 214 people who were categorized as intermediate-high Syntax score (SS > 22), and there were 189 patients who were categorized as low Syntax score (SS ≤ 22). In comparison with low SS group, patients who had a SS that was intermediate to high were more likely to be of advanced age, and these patients were also more likely to have HTN and DM. On the other hand, **Karadeniz *et al.*** [16] noted that 321 patients admitted with ACS, categorized regarding the SX score, patients who were categorized as having a low SX score were significantly younger (58 ± 12 years) than those who were categorized as having an intermediate to high Syntax score (63 ± 13 years) (P = 0.001 for both).

The currant results showed that, there was no significant differences observed between both groups regarding LVEF (Pvalue = 0.358), RWMA (Pvalue = 0.422), and ECG ischemic changes (P = 0.775). Contrary to our results a study that was carried out by **Karabağ *et al.*** [15] investigating the relation between CAR and Syntax scores, individuals who had high Syntax score, had lower LVEF values compared to individuals who had low Syntax score (P < .001). On the other hand, **Çağdaş *et al.*** [14] noted that LVEF was significantly lower in those with SX score >22 (45) than those with SX score ≤ 22 (52). Pvalue was <0.001.

Karadeniz *et al.* [16] stated that individuals with high Syntax score had lower LVEF values compared to individuals who had low syntax score (P < .001). Our results showed that there was no significant differences detected between both groups regarding LVEF because sample size was small.

Also we found that, LMCA was significantly higher in group 2 (24.5%) than in group 1 (1.7%). TVD was significantly higher in group 2 (22%) than in group 1 (0%). Bifurcation was significantly higher in group 2 (31.7%) than in group 1 (11.9%). CTO was significantly

higher in group 2 (29.3%) than in group 1 (8.5%). Lesion > 20 mm was significantly higher in group 2 (43.9%) than in group 1 (15.3%). Severe tortuosity was significantly higher in group 2 (31.7%) than in group 1 (13.6%). No significant differences were observed regarding heavy calcification and thrombosis. In agreement with the current study are the results by **Çağdaş *et al.*** [14] who stated that population with an intermediate-high SS had a high possibility to have LMCA disease (23.9%) than patients with low SS (2.2%) and population with an intermediate-high SS had a high possibility to have bifurcation (26.5%) than patients with low SS (13.9%) and population with an intermediate-high SS had a high possibility to have lesion length >20 mm (72.6%) than patients with low SS (53.7%). Population with an intermediate-high SS had a high possibility to have severe tortuosity (15.0%) than patients with low SS (6.9%). In another study done by **Karabağ *et al.*** [15] they stated that population with an intermediate-high SS group had a high possibility to have LMCA disease 83 (38.8%) than patients with low SS group 36 (19.0%).

Regarding laboratory findings in the studied patients, neutrophil was significantly higher in group 2 (7.6) than in group 1 (6). Platelets were significantly higher in group 2 (332%) than in group 1 (293). Median CRP was significantly higher in group 2 (14.8) than in group 1 (6). Median CAR was significantly higher in group 2 (35.6) than in group 1 (14.6). NLR was significantly higher in group 2 (3) than in group 1 (2.5). This is in agreement with **Karadeniz *et al.*** [16] who stated that in comparison with low SX score patients, the intermediate to high SX score patients had higher peak troponin and peak CK-MB and higher serum high-sensitive CRP. On the other hand, they had lower values of LDL and total cholesterol. We observed that there was a significant relation between SX score and high-sensitive CRP (r= .361, P < 0.001). **Çağdaş *et al.*** [14] stated that in comparison with the low SS group, the intermediate to high SS group had a higher levels of CRP and lower levels of albumin. The intermediate to high Syntax patients had a significantly higher median Car than the low Syntax patients (10 [6-23] vs 29 [13-68]).

Studying Correlation between CAR and other parameters, CAR had a significantly strong association with GRS (r= .370, P < 0.001), Syntax score (r= .855, P < 0.001), neutrophil (r= .548, P < 0.001), platelets (r= .346, P < 0.001), NLR (r= .441, P < 0.001), PLR (r= .217, P= 0.03). Along with our study **Çağdaş *et al.*** [14] noted that there was perfect association between CRP and CAR (r=0.995; P < 0.001), while there was a moderate association between albumin and CAR (r=.298; P < 0.001).

ROC analysis was done for CAR and NLR in differentiating those with syntax scores > 22. For CAR, it showed AUC0.99 and 95% CI; .978-1). The best cutoff point was ≤ 24.4 with 94.9% sensitivity and 95.1% specificity. For NLR, it showed AUC0.766 and 95% CI; .67-.862, P < 0.001. The best cutoff point was ≤ 2.7, with 76.3% sensitivity and 70.7% specificity. There was a significant difference between the two ROC curves (P < 0.001). Along with our study **Duman *et al.*** [17] stated that 0.15 represents the optimal cutoff point for CRP, CAR and albumin. The sensitivity of this value was at 88.4 % and the specificity was at 43.6 %. AUC was 0.697; 95%, P < .001. A CAR of > 24.4 had a sensitivity of 89.9% and a specificity of 37.1% (AUC0.661; 95%CI; .609-.711; P = 0.0001), whereas a CAR of 0.86 had sensitivity of 55.1% and specificity of 72.1%, according to the findings of the ROC analysis. (AUC0.654; 95%CI; .601-.703; P =001). **Kalyoncuoglu & Durmus** [18] noted that CAR >17 predicted SS > 22 with sensitivity of 86% and specificity of 76%. Compared to NLR, CAR had significantly greater (AUC) (AUC0.839; 95%CI; .770–.868) than NLR (AUC0.667; 95%CI; .598–.732) with P = 0.002.

In a study that was carried out by **Çağdaş *et al.*** [14] for determining the importance of the use of CAR instead of albumin and CRP to predict Syntax score. In comparison with CRP, CAR had significantly greater AUC (AUC: 0.775; 95% CI, 0.719-0.822) than CRP (AUC0.768; 95% CI, .719-.818; P=.044). In comparison with albumin, CAR had significantly greater AUC (AUC 0.775; 95% CI; .719-.822) than albumin (AUC0.696; 95% CI; .643-.752; P = .041). CAR >11 prognosed a Syntax score >22 with sensitivity of 71.7% and specificity of 71.4. There is a difference in CAR cut-off value observed between this study and our study because this study included patients who were admitted with ACS but our study included patients who were admitted with Non- STEMI.

Regarding prediction of intermediate-high SS, multivariate logistic regression was made to predict Syntax score > 22. It revealed that CAR was a significant independent predictor (OR; 1.67 & 95% CI; 1.258-2.245, P = .001). This is in agreement with **Kalyoncuoglu and Durmus** [18]. Also, **Karabağ *et al.*** [15] reported that the most strong variables to predict the high Syntax score were hsCRP (OR; 1.292; 95% CI; 1.138-1.475; P <.001), increased LDL, history of HTN, by using variables that showed relation (age, HTN, DM, platelet count, LVEF, CAR, albumin, LDL and triglyceride), but not including the coronary angiography data. **Karadeniz *et al.*** [16] showed that the most strong variables to predict the high Syntax score were high levels of high sensitive CRP (OR;1.13, 95% CI;1.055-1.255, Pvalue=.002), troponin levels (OR;1.123, 95%CI:1.051-1.271, Pvalue=.001) and LVEF (OR;.91, 95% CI;.864-.932, P <.001). So, raised blood levels of hsCRP were a potent indicator of a high Syntax score in ACS patients.

CONCLUSION

GRS, LMCA disease, TVD, Bifurcation, CTO, Lesion > 20 mm, severe tortuosity, neutrophil, platelets, median CRP, median CAR and NLR were significantly

higher in those with high Syntax score than those with low syntax score. CAR was revealed to be an independent predictor for the high SS group, with a stronger correlation to the complexity and severity of CAD.

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