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CORRELATION OF ANDERSON-WILKINS SCORE AND SCLAROVSKY-BIRNBAUM SCORE WITH MYOCARDIAL SALVAGE INDEX IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION AFTER PRIMARY PERCUTANEUS CORONARY INTERVENTION

J. Ch. Kurniawan

Department of Cardiology and Vascular Medicine, Faculty of Medicine,
Sam Ratulangi University – Manado, North Sulawesi, Indonesia

КОРЕЛАЦИЯ НА ANDERSON WILKINS SCOREИ SCLAROVSKY BIRNBAUM SCORE С MYOCARDIAL SALVAGE INDEX ПРИ ПАЦИЕНТИ СЪС ST-ЕЛЕВАЦИЯ НА МИОКАРДЕН ИНФАРКТ, ПОДЛОЖЕНИ НА ПЪРВИЧНА ПЕРКУТАННА ИНТЕРВЕНЦИЯ

Дж. Ч. Курниаван

Катедра по кардиология и съдова медицина, Медицински факултет
Университет „Сам Ратуланги“ – Манадо, Северен Сулавеси, Индонезия

Abstract. **Background:** Patients presenting with acute myocardial infarction with ST-segment elevation (STEMI) are recommended to undergo primary percutaneous coronary intervention (PPCI) as a reperfusion therapy to maximize myocardial salvage and maintain myocardial viability. The extent of the myocardial salvage index (MSI) is greatly influenced by the onset and severity of myocardial ischemia, which can be assessed using the Anderson-Wilkins score and the Sclarovsky Birnbaum score. **Objective:** This study aims to determine the effect of the Anderson-Wilkins score and the Sclarovsky Birnbaum score on the electrocardiogram-based myocardial salvage index in patients with STEMI undergoing PPCI. **Material and methods:** We conducted a hospital-based cross-sectional analytical study from March 1st, 2024, to May 31st, 2024. All STEMI patients who underwent PPCI and met the inclusion criteria had their initial ECG analyzed using the Anderson-Wilkins and Sclarovsky-Birnbaum scores, with an ECG-based myocardial salvage index (MSI) assessment conducted on the last day of hospitalization. **Results:** Out of a total of 60 study subjects, 70% of the sample patients were men, with an average age of 57.4 years. The median Anderson-Wilkins score was 2.25 (interquartile range (IQR) 1.52 - 3.0), with an AW score ≥ 3 observed in 17 patients (28.3%). Meanwhile, grade III ischemia severity (SB score = 3) was found in 52 patients (86.7%). The median total ischemic time was 850 min (IQR 570-1290), with a total ischemic time of < 720 min found in 23 patients (38.3%). The AW score showed a strong correlation with MSI ($p < 0.001$, $r = 0.588$), whereas the SB score did not ($p = 0.107$, $r = 0.163$). **Conclusion.** The Anderson-Wilkins score shows a strong correlation with the myocardial salvage index in patients with acute myocardial infarction with ST-segment elevation (STEMI) undergoing primary percutaneous coronary intervention.

Key words: Anderson-Wilkins score, Sclarovsky Birnbaum score, Myocardial Salvage Index, myocardial infarction with ST-segment elevation, primary percutaneous coronary intervention

Address for correspondence: James Chandra Kurniawan, Residen Doctor at Department of Cardiology and Vascular Medicine, Faculty of Medicine, Sam Ratulangi University – Manado, North Sulawesi, Indonesia, e-mail: chandrakurniawanjames@yahoo.co.id

Резюме. **Въведение:** При пациенти с остър инфаркт на миокарда с елевация на ST-сегмента (STEMI) се препоръчва първична перкутанна коронарна интервенция (PPCI) като реперфузионна терапия, за да се постигне максимално съхранение на миокарда и да се запази неговата жизнеспособност. Обхватът на индекса на миокардно съхранение (myocardial salvage index – MSI) се влияе в голяма степен от началото и тежестта на миокардната исхемия,

която може да се оцени с помощта на Anderson-Wilkins score и Sclarovsky-Birnbaum score. **Цел:** Целта на това проучване е да се определи влиянието на Anderson-Wilkins score и Sclarovsky-Birnbaum score върху базирания на електрокардиограма MSI при пациенти със STEMI, подложени на PPCI. **Материал и методи:** Това проучване е болнично кръстосано аналитично проучване, проведено от 1 март 2024 г. до 31 май 2024 г. На всички пациенти със STEMI, подложени на PPCI, които отговарят на критериите за включване, е направен първоначален анализ на ЕКГ с помощта на Anderson-Wilkins score и Sclarovsky-Birnbaum (SB) score, като в последния ден от хоспитализацията е извършена оценка на MSI, базиран на ЕКГ. **Резултати:** От общо 60 изследвани лица 70% от пациентите в извадката са мъже, със средна възраст 57,4 години. Средната стойност на Anderson-Wilkins (AW) score е 2,25 (интерквартилен диапазон (IQR) 1,52–3,0), като AW score ≥ 3 се наблюдава при 17 пациенти (28,3%). Същевременно тежест на исхемията от III степен (SB score = 3) е установена при 52 пациенти (86,7%). Медианата на общото исхемично време е 850 min (IQR 570-1290), като общото исхемично време от < 720 min е установено при 23 пациенти (38,3 %). Резултатът AW показва силна корелация с MSI ($p < 0,001$, $r = 0,588$), докато резултатът SB не показва такава ($p = 0,107$, $r = 0,163$). **Заключение.** Anderson-Wilkins score показва силна корелация с MSI при пациенти с остър миокарден инфаркт с елевация на ST-сегмента (STEMI), подложени на първична перкутанна коронарна интервенция.

Ключови думи: Anderson-Wilkins скор, Sclarovsky-Birnbaum скор, индекс на съхранен миокард, инфаркт на миокарда с елевация на ST-сегмента, първична перкутанна коронарна интервенция

Адрес за кореспонденция: Джеймс Чандра Курниаван, лекар-ординатор в Катедрата по кардиология и съдова медицина, Медицински факултет, Университет „Сам Ратуланги“ – Манадо, Северен Сулавеси, Индонезия, e-mail: chandrakurniawanjames@yahoo.co.id

Introduction

Cardiovascular disease accounts for approximately 32% of global deaths, with ischemic heart disease responsible for most of these cases [1]. Within the realm of acute coronary syndromes, ST-segment elevation myocardial infarction (STEMI) is characterized by prolonged ischemia due to occlusion in one of the major coronary arteries. The occlusion results in an interruption of blood flow to myocardial tissue, causing irreversible cellular damage if reperfusion is not achieved promptly. Patients presenting with STEMI are recommended to undergo reperfusion therapy within 12 hours onset of chest pain to maximize myocardial salvage and maintain myocardial viability [2, 3].

However, the history taking related to the onset of chest pain is highly subjective and often unreliable, especially in elderly patients, due to variations in patient memory, differences in perception of chest pain, non-specific chest pain, and silent infarction. Since prognosis and management strategies are significantly influenced by the duration of ischemia, additional parameters beyond history are needed. The patient's ECG recording upon hospital admission can help address this. The onset of myocardial infarction can be predicted using the Anderson-Wilkins (AW) score, a method for timing the evolution of myocardial infarction based on ECG. An AW score of ≥ 3 indicates acute ischemia [4]. A study by Sejersten M. and Ripa in Denmark, a sub-study of the DANAMI-2 (Danish Trial in Acute Myocardial Infarction 2), successfully demonstrated the superiority of the acute AW score over anamnesis regarding onset time in patients with anterior acute myocardial infarction for predicting myocardial salvage, prognosis, and the benefits of reperfusion therapy [5].

An ECG examination upon hospital admission can assist clinicians in assessing the size and location of the ischemic area, the severity of ischemia, and the extent of the myocardial area at risk of necrosis. In cases of anterior and inferior STEMI, the extent of the myocardium at risk of necrosis can be evaluated using the patient's admission ECG and calculated with the Aldrich score formula [6]. Meanwhile, terminal QRS distortion is known to reflect severe myocardial infarction and is categorized as grade 3 ischemia in the Sclarovsky-Birnbaum score. Approximately 19-53% of STEMI patients present with grade 3 ischemic ECG findings, which are associated with worse outcomes compared to grade 1 or 2 ischemia [7].

Primary percutaneous coronary intervention (PPCI) has become the preferred reperfusion strategy for patients with STEMI, as it directly restores blood flow to the ischemic myocardium. The success of PPCI in preserving myocardial tissue is commonly measured by the myocardial salvage index (MSI), which quantifies the percentage of myocardium preserved relative to the area at risk. MSI is considered a critical prognostic indicator, as greater salvage is associated with improved left ventricular function and reduced long-term complications.

Cardiac magnetic resonance imaging (MRI) is the gold standard for visualizing and calculating the extent of infarction and myocardial salvage, however in our daily practice, cardiac MRI was not readily available. Electrocardiogram (ECG)-based scoring systems offer a practical solution for evaluating ischemia-related myocardial injury in clinical settings where advanced

imaging, such as MRI, may not be available. Recently, The DETERMINE score (Defibrillators to Reduce Risk by Magnetic Resonance Imaging Evaluation), developed by Lee et al., is calculated based on ECG recordings and has been shown to have a strong correlation with infarct size as measured by MRI [8].

This study aims to determine the correlation of the Anderson-Wilkins score and the Sclarovsky Birnbaum score on the electrocardiogram-based myocardial salvage index in patients with STE-ACS undergoing PPCI.

Material and methods

This study was conducted as a hospital-based, cross-sectional analysis at RSUP Prof. Dr. R. D. Kandou Manado, a tertiary care facility with an advanced cardiac catheterization lab. Data were collected over a period of three months, from March 1, 2024, to May 31, 2024. All patients diagnosed with STEMI who presented to the emergency department and were eligible for PPCI were considered for inclusion. Additionally, to be included as a sample, patients must be over 17 years old and have complete results from coronary angiography, PCI procedure reports, laboratory tests, and complete ECG recordings from admission until discharge. Patients with history of previous STEMI, prior PCI or bypass surgery, ECG recordings showing lateral, posterior, or right ventricular STEMI, left bundle branch block, or right bundle branch block was excluded. Ethical approval for the study was obtained from the institutional review board, and written informed consent was provided by all participants. All ECG was analyzed manually by two independent investigators.

The severity of ischemia was assessed from admission ECG, according to the Sclarovsky-Birnbaum classification is represented as follows. Grade 1 ischemia is indicated by a tall and symmetric T wave); Grade II ischemia is characterized by ST elevation without distortion of the terminal portion of the QRS complex, and Grade III ischemia is marked by changes in the terminal portion of the QRS complex; is defined by the following criteria: (1) the absence of an S wave below the TP-PR isoelectric line in ≥ 2 leads that normally display a terminal S configuration (leads V1 to V3) or (2) an ST-J amplitude ≥ 50% of the R wave amplitude measured from the TP-PR isoelectric baseline in ≥ 2 remaining leads (I, II, III, aVL, aVF, V4-V6) [7].

The timing of ischemia was measured using Anderson-Wilkins score using admission ECG. Each lead with ST elevation or a tall T wave is categorized into phases (1A, 1B, 2A, or 2B) based on the presence of ST elevation, tall T waves, or abnormal Q waves. The four phases starting with the most acute were: phase 1A, tall T wave and no abnormal Q wave; phase 1B, positive T wave and no abnormal Q wave; phase 2A, tall T wave and abnormal Q wave, and phase 2B, positive T wave and abnormal Q wave. The AW acuteness score ranges from 1 (least acute) to 4 (most acute) and was calculated using the following formula [4, 5, 9]:

$$\text{AW acuteness score} = \frac{4(\text{number of leads 1A}) + 3(\text{number of leads 1B}) + 2(\text{number of leads 2A}) + (\text{number of leads 2B})}{\text{Total number of leads with 1A,1B, 2Aor 2B}}$$

To estimate the initial myocardial area at risk (AAR), the Aldrich score was calculated, based on ST-segment changes of admission ECG. The electrocardiographic AAR is then determined using the Aldrich score formula: for anterior STEMI, it is calculated as 3 × (1.5 × [number of leads with ST elevation] − 0.4); for inferior STEMI, it is calculated as 3 × (0.6 × [sum of ST elevation in leads II, III, and aVF] + 2.0), and expressed as a percentage of the left ventricular (LV) mass [6].

The DETERMINE score reflecting ECG final myocardial infarct size (FIS), was calculated from discharge ECG by adding twice the number of leads with Q waves, the number of leads with fragmented QRS (fQRS) complexes, and the number of leads with inverted T waves.

Myocardial salvage was calculated from the difference between the initial area at risk (AAR) at the onset of ischemia and the final infarct size (FIS). Myocardial salvage index (MSI) is equal to myocardial salvage divided by AAR.

Analyses were performed using SPSS statistical software (SPSS version 29.0; SPSS Inc., Chicago, Ill., USA). Descriptive statistics were used to summarize baseline demographic and clinical data. The correlation of the Anderson-Wilkins score and the Sclarovsky-Birnbaum score on the myocardial salvage index was analyzed using simple linear regression and Pearson correlation analysis. $p < 0.05$ was considered statistically significant.

Results

The study included 60 STEMI patients who underwent PPCI, with 70% of participants being male and a mean age of 57.4 years (standard deviation [SD] ±10.2). Comorbid conditions were common, with diabetes (32%) and hypertension (50%) being the most prevalent. The average total ischemic time (the duration from the onset of chest pain until wire crossing of the culprit lesion during PCI) in the sample was approximately 1,124 min (18 h and 44 min), with median of 850 min (interquartile range [IQR] 570–1290), with 38.3% presenting within 720 min.

Table 1. Baseline Characteristic

Characteristic		n (%)	Mean ± SD	Med (Q1-Q3)
Sex				
	Male	42 (70)	-	-
	Female	18 (30)	-	-
Age			57,4 ± 9,6	
Risk Factor				
	Smoking	32 (53,3)	-	-
	Diabetes	23 (38,7)	-	-
	Hypertension	41 (68,3)	-	-
	Dyslipidemia	36 (60)	-	-
Anderson - Wilkins Score				2,25 (1,52 - 3,0)
	Acute (score ≥3,0)	17 (28,3)	-	-
	Non- Acute (score < 3,0)	43 (71,7)	-	-
Sclarovsky Birnbaum Score			-	3,0 (3,0 - 3,0)
	Severe (grade III)	52 (86,7)	-	-
	Non Severe (grade 0 - II)	8 (13,3)	-	-
Total ischemic time (minutes)			-	850 (570 - 1290)
	< 720 minutes	23 (38,3)		
	720 minutes - 1440 minutes	24 (40,0)		
	> 1440 minutes	13 (21,7)		
Aldrich Score			-	21,3 (16,8 - 25,7)
Culprit Artery				
	LAD	38 (63,3)	-	-
	LCX	1 (1,7)	-	-
	RCA	21 (35)	-	-
TIMI Flow before PPCI				
	0	29 (48,3)	-	-
	1	3 (5)	-	-
	2	10 (16,7)	-	-
	3	18 (30)	-	-
TIMI Flow after PPCI				
	0	0	-	-
	1	0	-	-
	2	6 (10)	-	-
	3	54 (90)	-	-
Thrombus Burden				
	Low	17 (28,3)	-	-
	High	43 (71,7)	-	-
DETERMINE Score				7 (6 -10)
Myocardial Salvage index				11,3 (1,75 - 25,8)

Regarding angiographic parameters, 63.3% of the samples had culprit lesions in the left anterior descending (LAD) coronary artery. TIMI 0 flow was observed in 48.3% of the samples at the culprit artery on initial angiography, with a high thrombus burden (thrombus grade IV and V) present in 71% of the cases. Post-PCI, TIMI 3 flow was achieved in 90% of the samples.

In the ECG analysis, the median AW score was 2.25 (IQR 1.52–3.0) with acute ECG findings (AW score > 3) observed in 28.3 % of the samples. Meanwhile, the average Sclarovsky-Birnbaum (SB) score for the entire sample was 2.85, with severe ischemia (SB score = 3) identified in 86% of the samples. The average DETERMINE score across all samples was 8, with an average myocardial salvage index of 14.8%.

Table 2. Laboratory Findings during admission

Laboratory Findings	Mean ± SD	Med (Q1-Q3)
Hemoglobin (g/dL)	14,0 ± 1,69	-
uL)	-	11,6 (9,4 - 14,0)
L)	-	236,0 (210,0 - 286,0)
Ureum (mg/dL)	-	30,5 (23,0 - 37,7)
Kreatinin (mg/dL)	-	1,0 (0,8 - 1.1)
GDS (mg/dL)		124 (106,0 - 185,0)
Asam urat (mg/dL)		6,6 (5,5 - 8,2)
HbA1C (%)		5,75 (5,5 - 7,0)
Total Cholesterol (mg/dL)	208,2 ± 42,0	-
LDL (mg/dL)	-	137,0 (119,2 - 160,7)
HDL (mg/dL)	-	40,0 (35 - 45)
Triglycerides (mg/dL)	-	115,5 (96,2 -150,2)
SGOT (mg/dL)	-	72,0 (35,2 - 173,2)
SGPT (mg/dL)	-	36,0 (23,2 - 49,0)
CK	-	662,0 (250,2 - 1825,7)
CKMB	-	77,0 (49,5 - 160,7)
Troponin T (pg/dL)	-	540,0 (145,0 - 1766,0)
Sodium (mmol / L)	136,4 ±4,82	-
Potassium (mmol / L)	3,99 ± 0,57	-
Chloride (mmol / L)	-	94,0 (91,0 - 96,0)

A strong correlation was observed between the AW score and MSI ($p < 0.001$, $r = 0.588$), supporting the predictive value of the AW score for myocardial salvage. In contrast, the SB score showed no significant association with MSI ($p = 0.107$, $r = 0.163$), indicating that ischemic severity did not reliably predict myocardial salvage.

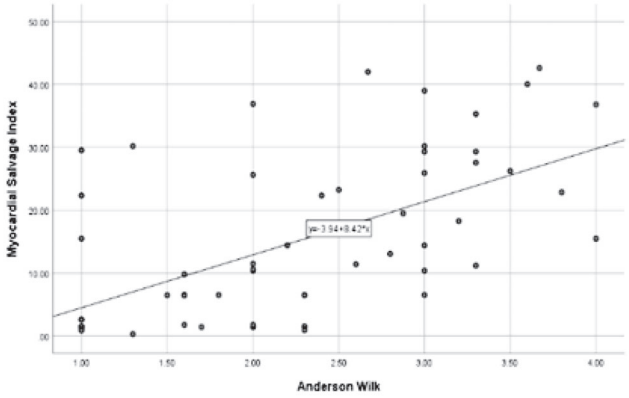

Fig. 1. Scatter Plot of the Relationship Between Anderson-Wilkins Score and Myocardial Salvage Index

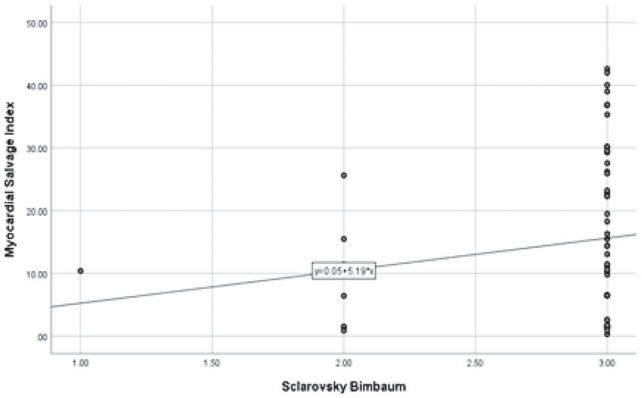

Fig. 2. Scatter Plot of the Relationship Between Sclarovsky-Birnbaum Score and Myocardial Salvage Index

Discussion

Salvaging the myocardium is the primary goal of reperfusion therapy in STEMI, as rescuing more myocardium accelerates the improvement of myocardial contractility and enhances patient prognosis [10]. From a clinical perspective, to assess the efficacy of reperfusion therapy, it is crucial to evaluate how much myocardium has been salvaged (myocardial salvage). This is done by measuring the difference between the

initial area at risk (AAR) at the onset of ischemia and the final infarct size (IS). Single-photon emission computed tomography (SPECT) has been widely used to measure the myocardial salvage index (MSI), which is an independent predictor of prognosis in STEMI. However, using SPECT for assessment in acute settings is impractical because it requires isotope injection before reperfusion therapy and involves additional radiation exposure [11]. Currently, cardiac MRI is considered the gold standard for measuring infarct size and has been proven to predict poor cardiovascular outcomes, such as death, recurrent infarction, and congestive heart failure [12, 13]; but unfortunately it is unavailable in our centre.

In daily clinical practice, the electrocardiogram (ECG) remains the primary supportive examination for evaluating patients suspected of having ischemic heart disease, including acute myocardial infarction [14]. Various ECG scores have been developed to calculate the extent of the myocardium at risk during the early stages of ischemia and the final infarct size, enabling the estimation of myocardium that can be salvaged with reperfusion therapy [15]. The use of ECG to assess infarct size is particularly valuable in the center where facilities for SPECT and cardiac MRI are not available in daily clinical practice.

The analysis revealed that the average total ischemic time in this sample study was 1124 min (with a median of 850 min). A total ischemic time of less than 1440 min was observed in 47 (78.3%) of the samples, with only 23 (38.3%) of them having an ischemic time of less than 720 min. This indicates that most patients with acute ST-elevation myocardial infarction (STEMI) experienced delays in reaching referral healthcare facilities equipped with reperfusion therapy capabilities, resulting in non-acute findings on the initial ECG recording upon hospital admission. These results differ significantly from the study by Leivo et al., which analyzed patients from the TOTAL trial, where the average total ischemic time was around 170 mins [16]. This disparity is challenging to address due to the referral management system between local hospitals in North Sulawesi, which still requires significant evaluation for acute coronary syndrome emergency cases. The analysis of the ECG revealed an average AW score of 2.23. An AW score ≥ 3.0 (indicating acute phase) was observed in only 17 (28.3%) of the samples. Most patients had an ECG that was no longer acute according to the AW score (≤ 3), with 43 (71.7%) samples falling into this category. The proportion of acute ECGs (AW score ≥ 3) is relatively low compared to other studies, such as the one by Sejersten et al., which reported an acute ECG proportion of 40% of their sample [17], Serafimov et al. with 54% [18], and Schoos et al. with 52% of their samples showing acute ECG findings [19].

The ECG analysis revealed a median Myocardial Salvage Index (MSI) of 11.3 (IQR 1.75-25.8) in this study. This value is relatively low compared to other studies, such as that by Zhang et al., who measured MSI using cardiac MRI and found a median value of 54.5% (IQR 39.5-75.3) [13]. The MSI value tends to decrease as the total ischemic time increases, as shown in the study by Eitel et al., where the highest MSI value of > 68% was achieved in patients with total ischemic times of less than 2 h, and the lowest MSI value of 26% was observed in those with a total ischemic time of 12 h. The trend of decreasing MSI values in that study aligns with the results of this study, where the median MSI was 11.3%, with a median total ischemic time of 850 min (IQR 570-1290) [20].

The effect of the AW score on the Myocardial Salvage Index (MSI) in patients with acute ST-elevation myocardial infarction (IMA-EST) was analyzed using linear regression, revealing a significant positive correlation ($p < 0.001$) with a moderately strong relationship based on Pearson's correlation ($r = 0.558$). This finding is consistent with previous studies, such as the one conducted by Sejersten et al. in Denmark, which analyzed MSI using cardiac MRI with samples from the DANAMI-2 trial. Their study found a significant relationship between the AW score and myocardial salvage, regardless of the reperfusion strategy used (thrombolysis or primary percutaneous coronary intervention). Higher AW scores were associated with higher MSI, with the highest MSI (> 40%) observed in the AW score quartile range of 3.43-4.0, and the lowest MSI (< 5%) observed in the AW score range of 0.00–2.43 [5]. Another study by Engblom et al. in Sweden also found a significant correlation with a moderate relationship between the AW score and myocardial salvage assessed by SPECT or MRI ($r = 0.57$, $p = 0.02$) in patients with IMA-EST and right coronary artery occlusion [21]. Additionally, a study conducted by Kristensen et al. in Denmark on late presenters (patients who arrived more than 12 hours after chest pain onset) showed a strong correlation between the AW score and MSI measured by myocardial perfusion imaging ($\beta = 0.60$, $R^2 = 0.36$, $p < 0.0001$). In their study, late presenters with an AW score ≥ 3 still had significant myocardial salvage after undergoing reperfusion therapy [22].

The results of the ECG analysis showed that the SB score of grade III (severe) was found in the majority of samples, accounting for 52 (86.7%). This proportion is higher when compared to other studies, such as the one conducted by Schoos et al., which reported a proportion of 25.8% of the sample [19], and the study by Fakhri et al., which found a proportion of 28.4% [23]. The SB score in this study was not normally distributed due to the relatively long average ischemic time of the samples, in contrast to the study by Schoos et al.,

which had a median value of 175 min, and the study by Fakhri et al. [19], which had a median value of 176 min [23]. The analysis of the effect of the SB score on the myocardial salvage index using simple linear regression did not achieve a statistically significant p-value ($p = 0.107$), and the correlation analysis between the two using Pearson's correlation coefficient yielded a very weak positive correlation ($r = 0.163$). Morphological changes in the terminal portion of the QRS complex in grade III ischemia are caused by prolonged electrical conduction in the Purkinje fibers within the ischemic zone, leading to an increase in the amplitude of the R wave in leads with a terminal R wave and a decrease in the amplitude of the S wave in leads with a terminal S wave. Since Purkinje fibers are less sensitive to ischemia compared to myocytes, they are theoretically affected only in the case of severe and prolonged ischemia, resulting in distortion of the terminal part of the QRS complex [24].

This study provides evidence that the Anderson-Wilkins ECG score is a reliable predictor of myocardial salvage in STEMI patients undergoing PPCI, whereas the Sclarovsky-Birnbaum score does not show a similar predictive capacity. The AW score's strong association with MSI can be attributed to its objective measurement of infarct progression through ST-segment elevation and T-wave changes. This approach mitigates the variability of patient-reported onset times, particularly among older adults who may experience atypical or subtle symptoms. In contrast, the SB score focuses primarily on ischemic severity, which does not directly correlate with the potential for myocardial recovery once reperfusion is achieved. Although higher SB scores are associated with greater ischemic damage, they do not account for salvageable myocardial tissue.

The correlation between the AW score and MSI highlights the importance of accurately estimating infarct timing to optimize reperfusion strategies. Our findings align with prior studies indicating that early ischemic intervention is critical for myocardial salvage. Delayed ischemia is associated with extensive necrosis, limiting the efficacy of reperfusion therapies. These results emphasize the need for accurate, objective timing tools like the AW score to guide clinical decisions and prioritize patients likely to benefit most from PPCI.

Clinical Implications

The AW score's ability to predict myocardial salvage has practical implications for clinical settings where advanced imaging may not be readily available. Implementing the AW score as part of routine STEMI evaluation could enhance treatment strategies, particularly in resource-limited environments. Further research may explore combining the AW and SB scores with additional clinical variables to improve outcome prediction accuracy.

Conclusion

The Anderson-Wilkins ECG score shows a significant correlation with myocardial salvage index in STEMI patients undergoing primary percutaneous coronary intervention, whereas the Sclarovsky-Birnbaum score does not. These findings suggest that myocardial salvage potential is more strongly associated with ischemic timing than severity, supporting the AW score as a valuable tool in STEMI management.

No conflict of interest was declared

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