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ORIGINAL ARTICLE

The Association between Tricuspid Annular Plane Systolic Excursion and Infarcted Related Artery in Patients with Inferior ST- Elevation Myocardial Infarction

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ABSTRACT

Background Adverse outcomes are more likely to occur in patients with right ventricular infarction who present with inferior ST-elevation myocardial infarction (STEMI). In order to identify patients who may have RV dysfunction earlier, the aim of this study is to determine a relationship between the culprit artery in inferior STEMI and tricuspid annular plane systolic excursion (TAPSE). **Methods** In this prospective cohort study, 200 patients who presented for the first time with acute inferior STEMI were included. Three groups of patients were formed according to which coronary artery was the culprit. At admission and following revascularization, RV function was evaluated using various echocardiographic measures, including TAPSE, RV-FAC, pulsed wave tissue Doppler imaging indices such as E′, A′, S′, MPI, and RV diastolic dysfunction. **Results** At a threshold level of >15, baseline TAPSE can be utilized to distinguish inferior STEMI culprit vessel between LCX and RCA patients. In RCA patients, there was a substantial statistically significant change (p-value<0.001) in S′, TAPSE, ICT, IRT, and MPI between baseline and pre-discharge. However, from baseline until the time of discharge, there was no statistically significant difference (p-value>0.05) in the E′, A′, RVFAC, ET, and LVEF of the RCA patients. **Conclusion** At a cutoff level of >15, baseline TAPSE can be used to suggest RCA patients from LCX patients as the cause of inferior STEMI. RV diastolic and systolic performances improved as a result of revascularization. In general, the prognosis for an RCA-related infarction is poorer than that of an LCX-related infarction. **Keywords** Right ventricular, Tricuspid annular plane systolic excursion, ST-elevation myocardial infarction.

INTRODUCTION

20 to 50% of patients with inferior STEMI develop right ventricular (RV) infarction, which leads to RV failure [1].

Compared to patients with isolated inferior infarction, patients with right ventricular infractions combined with inferior infractions have considerably increased odds of severe hypotension, inpatient mortality, and bradycardia needing pacing support [1].

Distal LAD blockage may occasionally be the cause of acute inferior wall myocardial infarction (IWMI), however the infarct-related artery in these patients may be the right coronary or left circumflex artery [2].

Particularly in individuals with IWMI, the electrocardiogram (ECG) frequently fails in predicting infarct-related coronary artery. Because ECG alterations are temporary and go away in 48% of the patients in less than 10 hours, they are not a very reliable tool for late presentations **[3].**

Due to its non-invasiveness, cost, accessibility, and absence of adverse effects, echocardiography is the preferred approach in clinical practice for evaluating the architecture and function of the RV. Numerous novel techniques for evaluating the RV

have been made possible by recent advancements **[1].**

The utility of different echocardiographic (Echo) markers of RV function in evaluating RV infarction and forecasting infarct associated arteries has not been extensively studied. They were mostly devoid of angiographic correlation **[2].**

In this work, we attempt to determine if RV function assessed by echocardiography can be used to predict the infarction associated artery and identify the inferior wall MI patients who are more likely to experience unfavorable clinical outcomes.

METHODS

This prospective cohort analysis included 200 individuals with acute inferior STEMI at the time of initial presentation. Between May 2023 and April 2024, the patients were admitted to El-Ahrar Teaching Hospital and Zagazig University's coronary care unit (CCU). The World Medical Association's (Declaration of Helsinki) rule of ethics was followed in the approval of the study by Zagazig University (IRB#10585), and each patient provided written, informed consent.

Patients with IWMI for the first time and hospitalized to the Cardiology Department were included in our analysis, either subjected to PCI or thrombolytic treatment. We excluded from our research patients with known cardiac muscle diseases, pacing rhythm, atrial fibrillation, cor-pulmonale, prior documented abnormal ventricular function, MI, valvular heart disease and left bundle branch block.

Based on the relevant infarct artery's angiographic location, 121 patients were assigned to the Right coronary artery (RCA) group, 77 patients to the Left circumflex artery (LCX) group, and two patients to the Left anterior descending artery (LAD) group.

Factors like age, sex, history of coronary artery disease, conventional risk factors (hypertension, diabetes mellitus, smoking, and positive family history of ischemic heart disease), chest pain, previous myocardial infarction, prior catheterization, and prior revascularization were all carefully considered during the comprehensive history-taking for each patient. General and local examination with a focus on blood pressure (systolic and diastolic), pulse rate, and rhythm was performed for each patient. Standard 12-lead electrocardiograms with right ECG, including V3R and V4R, captured at 25 mm/s and 10 mm/mv was obtained for each patient. The laboratory examination included a complete blood count (CBC), tests for liver and renal function, INR, PT, PTT, cardiac troponin I, lipid profile within 24 hours of admission, and a random blood glucose level.

Echocardiography:

In the left parasternal position and following the standards of the American Society of Echocardiography, we performed the following echocardiographic measurements for all patients:

RV fractional area change (RVFAC) was established as {(RV end diastolic area − RV end systolic area)/end diastolic area × 100} in order to evaluate RV function. The right ventricular area was measured in diastole and systole by tracking the RV endocardium in both phases, as described by the American Society of Echocardiography: from the annulus along the free wall to the apex and back to the annulus along the interventricular septum in the apical 4 chamber view. [4]

Tricuspid annular plane systolic excursion (TAPSE):

The tricuspid annulus was located at the lateral RV free wall in the apical 4-chamber view, and it followed the path of the M-mode cursor that passed through it. The longitudinal mobility of the annulus during peak systole was assessed by means of M-mode tracing. Using the leading edge of the echoes, the total displacement was calculated and expressed in millimeters. [5]

Myocardial performance index (MPI) by pulsed-wave Doppler method (MPI-PW):

Using the apical 4-chamber view, the sample volume was centered between the leaflet tips in the flow stream to determine the pulsed wave Doppler trans-tricuspid flow velocities. Peak atrial filling velocity (A), trans-tricuspid early fast filling velocity (E), and E/A ratio were measured. The duration between the tricuspid valve closure recorded at the end of the A wave and the tricuspid valve opening observed at the start of the E wave in the subsequent cardiac cycle is known as the tricuspid valve closure opening time (TCO), and it was calculated using the pulse wave Doppler tracing. The sample volume was introduced into the RV outflow tract in order to capture an outflow pulsed Doppler. The amount of time from the beginning of the flow to its end was determined as the ejection time (ET) [6]. We recorded beats with an R-R interval variation of less than 5%. To calculate the heart performance index, or MPI, TCO-ET was divided by ET.

Pulsed wave tissue Doppler imaging:

Pulsed DTI was acquired by positioning the cursor on the RV free wall at the level of the tricuspid annulus. A 3.5 mm sample volume will be used. Low wall filter settings, a 50 mm/s sweep

speed, and a Doppler velocity range of -20 to +20 cm/s were selected, and gains were adjusted. Given that this technique depends on Doppler, it will be considered essential to correctly align the ultrasound beam (<20 degrees).

The annulus traveled toward the apex with a high positive velocity (S′) during systole. Two main negative waves were observed during diastole: one during early diastole (E′) and one during late diastole (A′) as a result of the annulus moving towards the base during the diastole. The time interval between the end of S′ and the start of E′ was measured using isovolumic contraction time (ICT), the time interval between the end of A′ and the start of S′ was measured using isovolumic relaxation time (IRT), and the duration of S′ was measured using ejection time (ET) [7].

RV diastolic dysfunction:

RV diastolic dysfunction was graded using the trans-tricuspid E/A ratio, E/E′ ratio, and E deceleration time. A reduced relaxing E/A ratio was indicated by an E/A ratio <0.8, pseudo normalization was indicated by an E/A ratio 0.8 to 2.1 with an E/E′ ratio >6, and restricted filling was indicated by an E/A ratio >2.1 with a deceleration duration <120 ms [8].

Coronary Angiography and PCI TO IRA

For all patients, either direct primary PCI or pharmaco-invasive PCI following thrombolysis, coronary angiography and revascularization were performed right away.

Statistical analysis

The data was examined using SPSS (Statistical Program for Social Science) version 24. The qualitative data were represented by percentage and frequency. The unpaired Student's t-test and the Mann Whitney U test (MW) were used to define the data as mean ±SD for regularly distributed data or median (IQR) for not normally distributed data when comparing quantitative data between the two groups. It was determined that a P-value of less than 0.05 was required for statistical significance. Receiver operating characteristics (ROC curve) was performed to assess cut-off value of TAPSE which predict the infarct-related artery.

RESULTS

According to Table 1, there was statistically non-significant difference between RCA and LCX groups regarding age (p-value = 0.623), diabetes mellitus (p-value = 0.146), hypertension (p-value = 0.858), positive family history (p-value = 0.137) and smoking (p-value = 1.0). There was a substantial increase in SBP and DBP (p-value < 0.001) in patients with LCX, but not the heart rate. RCA group had significantly higher troponin and CK-MB levels (p-value < 0.001).

Table 1. Comparison of demographic data, Vital signs between LCX and RCA patients.

		LCX (N = 77)		RCA (N = 121)		Stat. test	P-value
Age (years)	**Median**	59		64		MW = 4465.5	> **0.05** NS
	IQR	54 - 69		52 – 68			
Sex	**Male**	65	84.4%	91	75.2%	X^2 = 2.38	> **0.05** NS
	Female	12	15.6%	30	24.8%		
Comorbidities	**DM**	34	44.2%	41	33.9%	X^2 = 2.1	> **0.05** NS
	HTN	34	44.2%	55	45.5%	X^2 = 0.03	> **0.05** NS
	Positive Family history	6	7.8%	18	14.9%	2.21	> **0.05** NS
	Smoking	14	18.2%	22	18.2%	0.0	> **0.05** NS
SBP (mmHg)	**Mean ±SD**	139.5 ± 13.1		124.1 ± 26.7			< **0.001 HS**
	Range	70 - 145		70 – 145			
DBP (mmHg)	**Mean ±SD**	90.1 ± 7.6		82.5 ± 16.2			< **0.001 HS**
	Range	50 - 100		40 – 100			
HR (beat/min)	**Mean ±SD**	67.7 ± 7.6		66.3 ± 9.7			> **0.05** NS
	Range	56 - 80		25 - 80			

		LCX (N = 77)	RCA (N = 121)	MW	P-value
Laboratory data	**Creatinine**	0.9 (0.8 - 1.1)	0.9 (0.7 - 1.5)	4103	> **0.05** NS
	TG	166 (151 - 188)	177 (153 - 193.5)	3932.5	> **0.05** NS
	Troponin I	83 (64 - 98)	98 (71 - 128)	**3242.5**	< **0.001 HS**
	LDL	162 (146 - 176)	169 (155 - 182)	3925	> **0.05** NS
	CKMB	119 (95.5 - 132.5)	154 (130 - 188)	**1236.5**	< **0.001 HS**

MW: Mann Whitney U test. S: p-value < 0.05 considered significant.
HS: p-value < 0.001 considered highly significant.
X^2: Chi-square test. NS: p-value > 0.05 considered non-significant.

Table 2 shows that the percentage of V3R-V4R ST elevation in RCA patients was considerably greater (p-value < 0.001) than in LCX patients. RCA patients had significantly reduced S', E' and A' compared to LCX group (p-value = 0.001). In RCA group, TAPSE, RVFAC was significantly lower (p-value < 0.001). In RCA patients, there was a highly significant (p-value < 0.001) drop in LVEF and a statistically significant (p-value = 0.004) rise in MPI.

Table 2. Comparison of V3R-V4R ST segment elevation and baseline echocardiographic data between LCX and RCA patients.

		LCX (N = 77)		RCA (N = 121)		Stat. test	P-value
V3R-V4R ST	**No**	77	100%	63	52.1%	X^2 = **52.2**	< **0.001 HS**
	Yes	0	0%	58	47.9%		
ECHO data		**LCX (N = 77)**		**RCA (N = 121)**		**MW**	**P-value**
Baseline ECHO data	**S' (cm/sec)**	13.2 (12.1 - 14.2)		9.8 (8.1 - 12.3)		**1431**	< **0.001 HS**
	E' (cm/sec)	10.1 (9.6 - 11.4)		9.3 (6.2 - 10.3)		**2554**	< **0.001 HS**
	A' (cm/sec)	12.2 (12 - 13)		12.1 (11 - 12)		**3447.5**	**0.001 S**
	TAPSE (mm)	23.3 (19.7 - 25)		18.1 (14 - 20)		**1419**	< **0.001 HS**
	RVFAC (%)	44.2 (41 - 46.5)		35.2 (28 - 37)		**525**	< **0.001 HS**
	ICT (ms)	60.5 (54.5 - 68)		65.3 (52 - 83.5)		**3838.5**	< **0.05 S**
	IRT (ms)	52.4 (45 - 55.5)		63.5 (52 - 86)		**2438**	< **0.001 HS**
	ET (ms)	265.3 (250 - 281)		265.5 (255.5 - 288)		4070	> **0.05** NS
	MPI	0.4 (0.4 - 0.5)		0.5 (0.4 - 0.6)		**3540**	**0.004 S**
	LVEF (%)	62 (57 - 67)		58 (54 - 64)		**3240**	< **0.001 HS**

X^2: Chi-square test. HS: p-value < 0.001 considered highly significant.
MW: Mann Whitney U test. S: p-value < 0.05 considered significant.
HS: p-value < 0.001 considered highly significant.
NS: p-value > 0.05 considered non-significant.

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Figure 1, using a ROC curve, it was demonstrated that baseline TAPSE has 100% sensitivity, 49.7% specificity, 55% PPV, and 100% NPV (AUC = 0.84 & p-value < 0.001) making it useful for differentiating between LCX patients and RCA patients at a cutoff level of > 15.

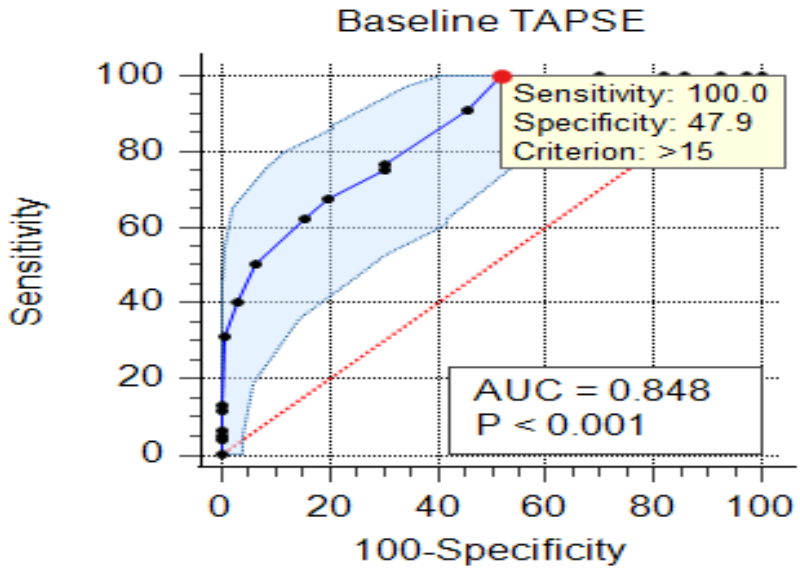

Figure 1. ROC curve between LCX and RCA patients as regard baseline TAPSE.

According to Table 3, Pre-hospital discharge, RCA group had lower values of S', E' and A' (p-value < 0.001). The TAPSE and RVFAC in RCA group were highly significant lower (p-value < 0.001). There was no statistically significant difference between the MPIs of RCA and LCX patients (p-value = 0.065). Compared to LCX people, LVEF was statistically substantially (p-value = 0.001) lower in RCA patients.

Table 3. Comparison of pre-discharge echocardiographic data between LCX and RCA patients.

		LCX (N = 77)	RCA (N = 121)	MW	P-value
Pre-discharge ECHO data	**S' (cm/sec)**	13.2 (12.1 - 14.2)	10.5 (9.8 - 12.3)	**1445**	**< 0.001 HS**
	E' (cm/sec)	10.2 (9.6 - 11.4)	9.5 (6.3 - 10.3)	**2549**	**< 0.001 HS**
	A' (cm/sec)	12.3 (12 - 13)	12.2 (11 - 12)	**3447.5**	**< 0.05 S**
	TAPSE (mm)	23.5 (19.7 - 25)	18.1 (15 - 20)	**1419**	**< 0.001 HS**
	RVFAC (%)	44.2 (41 - 46.5)	35.2 (28.3 - 37)	**525**	**< 0.001 HS**
	ICT (ms)	60.1 (54.5 - 68)	54.5 (51.3 - 57)	**2623**	**< 0.001 HS**
	IRT (ms)	52.3 (45 - 55.5)	55.2 (52 - 61)	**3388.5**	**< 0.05 S**
	ET (ms)	265.5 (250 - 281)	268.5 (258 - 288)	3742	**> 0.05** NS
	MPI	0.4 (0.4 - 0.5)	0.4 (0.4 - 0.4)	3764.5	**> 0.05** NS
	LVEF (%)	62 (57 - 67)	58 (55 - 64)	**3231**	**< 0.05 S**

MW: Mann Whitney U test. S: p-value < 0.05 considered significant.
HS: p-value < 0.001 considered highly significant.
NS: p-value > 0.05 considered non-significant.

Table 4 showed that the mortality difference between RCA and LCX patients was not statistically significant (p-value = 0.071).

Table 4. Comparison of mortality and reperfusion type between LCX and RCA patients.

		LCX (N = 77)		RCA (N = 121)		Stat. test	P-value
Mortality	**Not survived**	0	0%	5	4.1%	$X^2 = 3.26$	**> 0.05** NS
	Survived	77	100%	116	95.9%		
Reperfusion type	**Thrombolytic**	3	3.9%	18	14.9%	**$X^2 = 5.9$**	**< 0.05 S**
	PCI	74	96.1%	103	85.1%		

X^2: Chi-square test. NS: p-value > 0.05 considered non-significant.

S: p-value < 0.05 considered significant.

Table 5 showed that there was no statistically significant (p-value > 0.05) correlation between the baseline or pre-discharge TAPSE and the other parameters examined in LCX patients. In RCA group, baseline TAPSE had a statistically significant positive correlation with S', E' (p-value = 0.044), LVEF and RVFAC (p-value < 0.001) and negative correlation with A'. Pre-discharge TAPSE had a positive statistically significant correlation with S', E', LVEF and RVFAC. Pre-discharge TAPSE and MPI showed a significant statistically significant negative correlation (p-value < 0.001).

Table 5. Correlation study between baseline TAPSE, pre-discharge TAPSE and other studied data in LCX and RCA patients.

Baseline TAPSE	**LCX patients (n = 77)**		**RCA patients (n = 121)**	
	r	**p-value**	**r**	**p-value**
Age	-0.056	0.626	-0.006	0.944
SBP	-0.044	0.702	0.123	0.178
DBP	-0.077	0.507	0.157	0.086
HR	-0.017	0.883	-0.076	0.405
Creatinine	0.064	0.58	**-0.424**	**< 0.001**
TG	-0.054	0.641	**-0.806**	**< 0.001**
Troponin I	-0.059	0.612	**-0.757**	**< 0.001**
LDL	-0.151	0.189	**-0.755**	**< 0.001**
CK-MB	-0.118	0.305	**-0.823**	**< 0.001**
S' (cm/sec)	0.102	0.378	**0.766**	**< 0.001**
E' (cm/sec)	0.115	0.321	**0.878**	**< 0.001**
A' (cm/sec)	0.114	0.325	**-0.183**	**0.044**
RVFAC (%)	0.123	0.288	**0.77**	**< 0.001**
ICT (ms)	-0.1	0.387	**-0.838**	**< 0.001**
IRT (ms)	-0.069	0.549	**-0.853**	**< 0.001**
ET (ms)	-0.149	0.196	**0.232**	**0.011**
MPI	-0.036	0.756	**-0.832**	**< 0.001**
LVEF (%)	0.054	0.64	**0.315**	**< 0.001**
Pre-discharge TAPSE	**r**	**p-value**	**r**	**p-value**
Age	-0.056	0.626	-0.025	0.793
SBP	-0.044	0.702	0.078	0.406
DBP	-0.077	0.507	0.118	0.206
HR	-0.017	0.883	-0.264	0.004
Creatinine	0.064	0.58	**-0.429**	**< 0.001**
TG	-0.054	0.641	**-0.792**	**< 0.001**
Troponin I	-0.059	0.612	**-0.744**	**< 0.001**
LDL	-0.151	0.189	**-0.741**	**< 0.001**

Baseline TAPSE	LCX patients (n = 77)		RCA patients (n = 121)	
	r	p-value	r	p-value
CK-MB	-0.118	0.305	**-0.814**	**< 0.001**
S' (cm/sec)	0.102	0.378	**0.636**	**< 0.001**
E' (cm/sec)	0.115	0.321	**0.85**	**< 0.001**
A' (cm/sec)	0.114	0.325	-0.166	**> 0.05**
RVFAC (%)	0.123	0.288	**0.758**	**< 0.001**
ICT (ms)	-0.1	0.387	**-0.328**	**< 0.001**
IRT (ms)	-0.069	0.549	**-0.435**	**< 0.001**
ET (ms)	-0.149	0.196	**0.184**	**0.048**
MPI	-0.036	0.756	**-0.451**	**< 0.001**
LVEF (%)	0.054	0.64	**0.245**	**0.008**

(r): Pearson correlation coefficient.

According to Table 6, there was no discernible difference between the pre-discharge and baseline ECHO data for LCX patients (p-value > 0.05). However, in RCA group we observed a notably improvement in RV systolic and diastolic functions after reperfusion evidenced by the following, there was a statistically significant increase in S' and TAPSE and decline in MPI in RCA patients (p-value < 0.001). There was no statistically significant change (p-value > 0.05) in the ECHO data (E', A', RVFAC, ET, and LVEF) between the time of discharge and baseline for RCA patients.

Table 6. Comparison of ECHO data in LCX patients, RCA patients before and after reperfusion.

LCX patients	ECHO		z	P-value
	Baseline (N = 77)	Pre-discharge (N = 77)		
S' (cm/sec)	13.2 (12.1 - 14.2)	13.3 (12.1 - 14.2)	0.0	**> 0.05**NS
E' (cm/sec)	10.1 (9.6 - 11.4)	10.2 (9.6 - 11.4)	0.0	**> 0.05**NS
A' (cm/sec)	12.3 (12 - 13)	12.1 (12 - 13)	0.0	**> 0.05**NS
TAPSE (mm)	23.2 (19.7 - 25)	23.2 (19.7 - 25)	0.0	**> 0.05**NS
RVFAC (%)	44.2 (41 - 46.5)	44.3 (41 - 46.5)	0.0	**> 0.05**NS
ICT (ms)	60.2 (54.5 - 68)	60.3 (54.5 - 68)	0.0	**> 0.05**NS
IRT (ms)	52.1 (45 - 55.5)	52.5 (45 - 55.5)	0.0	**> 0.05**NS
ET (ms)	265.3 (250 - 281)	265.2 (250 - 281)	0.0	**> 0.05**NS
MPI	0.4 (0.4 - 0.5)	0.4 (0.4 - 0.5)	0.0	**> 0.05**NS
LVEF (%)	62 (57 - 67)	62 (57 - 67)	0.0	**> 0.05**NS
RCA patients	**ECHO**		**z**	**P-value**
	Baseline (N = 121)	**Pre-discharge (N = 121)**		
S' (cm/sec)	9.8 (8.1 - 12.3)	10.5 (9.8 - 12.3)	**6.2**	**< 0.001 HS**
E' (cm/sec)	9.3 (6.2 - 10.3)	9.5 (6.3 - 10.3)	0.0	**> 0.05**NS
A' (cm/sec)	12.3 (11 - 12)	12.1 (11 - 12)	0.0	**> 0.05**NS
TAPSE (mm)	18.2 (14 - 20)	18.2 (15 - 20)	**3.5**	**< 0.001 HS**
RVFAC (%)	35.3 (28 - 37)	35.4 (28.3 - 37)	0.0	**> 0.05**NS
ICT (ms)	65.2 (52 - 83.5)	54.5 (51.3 - 57)	**6.3**	**< 0.001 HS**
IRT (ms)	63.1 (52 - 86)	55.3 (52 - 61)	**6.3**	**< 0.001 HS**
ET (ms)	265.2 (255.5 - 288)	268.5 (258 - 288)	0.0	**> 0.05**NS
MPI	0.5 (0.4 - 0.6)	0.4 (0.4 - 0.4)	**6.3**	**< 0.001 HS**
LVEF (%)	58 (54 - 64)	58 (55 - 64)	0.0	**> 0.05**NS

z: z score of Wilcoxon test. NS: p-value > 0.05 considered non-significant.
HS: p-value < 0.001 considered highly significant.

DISCUSSION

Age, sex, DM, HTN, smoking, and a positive family history did not differ statistically significantly between LCX and RCA patients in this investigation. Moreover, there was no statistically significant difference in the blood creatinine, TG, or LDL levels between the RCA and LCX patients. Patients with RCA had significantly higher levels of troponin and CK-MB compared to those with LCX (p-value < 0.001).

Sohrabi et al. evaluated 150 consecutive patients with acute inferior wall STEMI concurrently with our investigation. RCA or LCX was the type of infarct-related artery that the patients were classified into. Age, gender, blood sugar, systolic and diastolic blood pressure, hypertension, hyperlipidemia, creatinine level, and white blood cell count were the same baseline characteristics shared by the two patient groups. They also both currently smoked and had diabetes mellitus. On the other hand, the LCX group had significantly increased myocardial enzyme release (p<0.001) [9].

Furthermore, Rasoul et al. demonstrated that in 229 patients (14%), the RCA was the infarct-related vascular; in 600 patients (36%), the left main was the infarct-related artery; in 23 patients (1.4%), the graft was the infarct-related vessel; and in 786 patients (47%), the RCA was the infarct-related vascular. The cohort of 829 people serves as the foundation for this analysis since patients with the RCA, an infarct-related artery, were compared with patients with the LCX in this study. It was found that the two groups did not differ statistically significantly in terms of age, gender, positive family history, smoking, diabetes, hypertension, or hypertension [10].

Our analysis showed a strong statistically significant (p-value < 0.001) increase in the percentage of V3R-V4R ST elevation in RCA patients (58 patients, 47.9%) as compared to LCX patients (0 individuals, 0%).

Comparing RCA patients to LCX patients, baseline ECHO data showed statistically significant decreases in S', E', A', TAPSE, RVFAC, and LVEF (p-value < 0.05). Between RCA and LCX patients, there were statistically significant differences in ICT, IRT, and MPI (p-values = 0.037, <0.001, and 0.004, respectively). There is no statistically significant difference in ET between RCA and LCX patients (p-value = 0.134).

Similar to our study, O"zdemir et al. recruited sixty individuals who had their first acute inferior MI. The patients were categorized into three groups according to the location of the infarct-related artery (IRA) found by coronary angiography: group I was allocated to the proximal RCA, group II to the distal RCA, and group III to the LCX. They discovered that patients in group I had considerably lower right ventricular Sm [p < 0.001] in comparison to patients in groups II and III. The MPI was high (p < 0.001) in the same patient groups. While the ET of the right ventricular free wall was lower in group I compared to groups II and III, the MPI and IRT of the right ventricular free wall were significantly greater. Additionally, group I had a lower Em and a higher ICT than group III [11].

Using the ROC curve, it was demonstrated in this work that Baseline TAPSE had 100% sensitivity, 49.7% specificity, 55% PPV, and 100% NPV (AUC = 0.84 & p-value < 0.001) when used to distinguish LCX patients from RCA patients at a threshold level of >15.

According to Shetaya et al., TAPSE < 16 mm is a 100% specificity and 93% sensitivity predictor of proximal RCA lesion [1].

There was no statistically significant difference in mortality (p-value = 0.071) between RCA and LCX patients in the current experiment. In LCX patients, all patients (100%) survived. In RCA patients, there were 5 not survived patients (4.1%) and 116 survived patients (95.9%).

As regard pre discharge ECHO data, there was statistically significant decreased S', E', A', TAPSE, RVFAC, ICT and LVEF in RCA patients when compared with LCX patients (p-value < 0.05). RCA patients had statistically significant higher IRT compared to LCX patients (p-value = 0.004). The ET and MPI of RCA and LCX patients do not differ statistically significantly.

Shetaya et al.'s findings support ours, showing that the RCA stenosis group (A) had considerably reduced TAPSE and S′. In the proximal RCA stenosis group, however, tissue Doppler and pulsed Doppler revealed higher MPI [1].

There was a statistically significant difference (p-value = 0.014) in the type of reperfusion between RCA and LCX patients. In LCX patients, there were 3 patients (3.9%) had

thrombolytic therapy and 74 patients (96.1%) had PCI. In RCA patients, there were 18 patients (14.9%) had thrombolytic therapy and 103 patients (85.1%) had PCI.

Rasoul et al., showed as regard therapy, PCI was done in 97% in RCA patients and in 94% of LCX lesion patients[10].

The mean duration (2 days) between groups for the development of chest discomfort and PCI was reported by Sohrabi et al.[9].

A prior study has demonstrated a strong association between RV infarction-related ECG findings and TAPSE [12].

Additionally, Rajesh et al. performed CAG on 67 of the 90 patients who had their first episode of IWMI. TAPSE, MPI by TDI, and S′ velocity showed good interobserver correlation [3].

According to the current analysis, the ECHO data for the LCX patients did not change in a way that was statistically significant between the time of baseline and discharge (p-value > 0.05). Nevertheless, from baseline to pre-discharge, there was a significant statistical shift (p-value < 0.001) in S', TAPSE, ICT, IRT, and MPI in RCA patients. Between the time of baseline and discharge, there was no statistically significant change (p-value > 0.05) in the ECHO data (E', A', RVFAC, ET, and LVEF) for RCA patients.

Patients with inferior wall MI brought on by dominant LCX blockage had a poor prognosis, according to earlier studies by Yip et al. [13]. Patients who received primary PCI and had inferior STEMI caused by LCX had a worse 30-day prognosis than patients who had inferior STEMI connected to RCA, according to Chen et al [14].

The limitations of the study:

The study's small sample size might have restricted the applicability of the findings. We excluded patients with previous RV dysfunction like valvular heart disease, previous documented abnormal ventricular function, previous MI, chronic chest condition and or Cor-pulmonale.

CONCLUSION

Baseline TAPSE can be used to differentiate inferior STEMI in RCA and LCX patients with 100% sensitivity, 49.7% specificity, 55% PPV, and 100% NPV at a cutoff level of > 15 (AUC = 0.84 & p-value < 0.001). When compared to the baseline examination, revascularization improved the right ventricle's systolic and diastolic function. The prognosis for an RCA-related infarction is generally poorer than that of an LCX-related infarction.

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