

Risk stratification of covid-19 patients presented with acute coronary syndrome

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Abstract

Multiple cases of cardiovascular involvement, including acute coronary syndrome, have been recorded since the catastrophic epidemic of coronavirus disease 2019 (COVID-19) in early 2020. The purpose of this investigation was to categorise people with acute coronary syndrome (ACS) into one of nineteen different groups. Patients and Methods: From May 2021 to April 2022, 200 patients with ACS were hospitalised to the CCU Department at Benha University Hospital for this prospective research. The GRACE scores of the groups investigated do not vary substantially from one another (non-significantly higher in patients with COVID-19) The results of this research show that people with ACS who also have COVID-19 are more likely to appear late and to die while hospitalised than those with ACS who do not have COVID-19.

Keywords: ACS, COVID-19, Myocardial infarction, STEMI.

1. Introduction

Acute coronary syndrome refers to a collection of symptoms and signs that occur when the heart suddenly receives less blood than usual. Myocardial infarction, or a heart attack, is one such disorder that occurs when cell death causes damage to or destruction of heart tissue. Reduced blood flow to the heart is a warning indicator indicating an increased risk of heart attack [1], even if acute coronary syndrome does not directly cause cell death.

Despite significant advancements in the treatment of ACS, it remains the leading cause of mortality globally at a young age. World Health Organization estimates that there were 8.1 million fatalities globally due to IHD in 2013 (95% uncertainty range, 7.3-8.8 million) and that this figure has increased by 42% since 1990 [2,3].

Acute coronary syndrome (ACS) patients often utilise risk assessments before deciding on a course of therapy. Major adverse cardiac events (MACE) risk scores are used at the time of first hospital presentation to help determine if a patient is at low or high risk for developing MACE and whether they should be discharged or admitted immediately for treatment.

Each of these metrics was designed for short-term prognosis, with the GRACE risk score (RS) focusing on in-hospital events, the TIMI RS on 14 days, and the PURSUIT RS on 30 days. However, it is

unknown whether these RS can also predict the incidence of the substantial number of adverse events in NSTEMI ACS patients that occur beyond the first 30 days. However, evidence suggests that beginning an intrusive treatment plan sooner rather than later improves prognosis. The GRACE risk model was recently validated as a predictor of mortality or myocardial infarction (MI) 6 months after hospital presentation [4].

2. Patients and Methods

From May 2021 to April 2022, researchers in the CCU department at Benha University Hospital gathered data as part of a prospective, single-center observational study. All patients infected with COVID-19 who met the criteria for acute coronary syndrome (UA, NSTEMI, STEMI) were included.

Patients who required mechanical breathing, had a history of end-stage renal disease (ESRD), had had coronary artery bypass grafting, or had missing data for risk ratings such the Grace Score were not included.

On the day of admission to the CCU, patients had their full medical histories reviewed, electrocardiograms (ECGs), two-dimensional echocardiograms (ECHOs), computed tomography (CT) scans, and laboratory investigations performed, with serum creatinine, troponin, creatinine kinase, and serum creatinine kinase MB (CKMB) measured for use in risk stratification using the GRACE score [5].

3. Results

Table (1) Comparison between the studied groups regarding baseline data

	Groups		χ^2	Test p
	ACS with COVID-19 group N=100 (%)	ACS without COVID-19 group N=100 (%)		
Age (year):	61.43 ±11.48	58.37 ± 12.63	1.792	0.075
Sex				
Female	36 (36%)	30 (30%)	0.814	0.367
Male	64 (64%)	70 (70%)		
Diabetes	43 (43%)	38 (38%)	0.519	0.471
Hypertension	64 (64%)	30 (30%)	20.513	<0.001**
Dyslipidemia	20 (20%)	5 (5%)	8.303	<0.004**
Smoking	44 (44%)	54 (54%)	2.001	0.157

There is statistically significant difference between the studied groups regarding hypertension and dyslipidemia (larger percentage of patients of group ACS with COVID-19 had hypertension and dyslipidemia; 64% and 20% versus 30% and 5% within those without COVID infection respectively). There is statistically non-significant difference between the studied groups regarding age, sex, comorbid diabetes, smoking or positive family history (Table 1).

Table (2) Comparison between the studied groups regarding GRACE and TIMI score

	Groups		Test	
	ACS with COVID-19 group Mean \pm SD	ACS without COVID-19 group Mean \pm SD	t	P
GRACE	133.17 \pm 36.96	130.06 \pm 43.14	1.073	0.285

In ACS with COVID-19 group, the mean GRACE score was 133.17 \pm 36.96 and the median TIMI was 5. In ACS without COVID-19 group, the mean GRACE score was 130.06 \pm 43.14.

4. Discussion

From May 2021 to April 2022, researchers in the CCU department at Benha University Hospital gathered data as part of a prospective, single-center observational study. All patients infected with COVID-19 who met the criteria for acute coronary syndrome (UA, NSTEMI, STEMI) were included.

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5. Conclusion

Novel mechanistic results from this research show that COVID-19 ACS patients appear later and have higher in-hospital mortality relative to the general ACS cohort.

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