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Original article

Usefulness of Colchicine to Reduce Peri-Procedural Myocardial Injury in Patients Who Underwent Primary Percutaneous Coronary Intervention

Mohamed A. Elian, Metwally H. El Emery, Ali I. Attia, Mohamed G. Mansour

Cardiology Department, Faculty of Medicine Benha University, Egypt.

Corresponding to:
Dr. Mohamed G. Mansour. Cardiology Department, Faculty of Medicine Benha University, Egypt.

Email:
moha71291@gmail.com

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Abstract:

Background: Percutaneous coronary intervention (PCI) is an invasive, yet non-operative procedure designed to alleviate the constriction of the coronary artery. PCI is indicated for various clinical scenarios in the management of coronary artery disease (CAD). Inflammation plays an important role in cardiovascular disease (CVD), and markers of inflammation can predict future CVD events. Colchicine directly inhibits neutrophil chemotaxis and activity in response to vascular injury, produces inhibitory effects on the inflammasome, and reduces neutrophil-platelet aggregates. **Aim:** To study the effect of colchicine given pre-PCI on post-PCI-induced myocardial injury within 24 hours of the index PCI procedure among patients with ACS who underwent primary PCI. **Methods:** This prospective interventional study included patients with a diagnosis of acute coronary syndrome who underwent primary PCI and were divided into two groups: group 1 (patient group) included patients who received colchicine, and group 2 (control group) included patients who received placebo. Laboratory investigations included cardiac biomarkers, immediately pre- and 24 hours post-PCI, C-reactive protein and interleukin-6 and kidney function tests including urea and creatinine. Transthoracic echocardiography was done on every patient. **Results:** The current study revealed no significant variations between the colchicine and placebo groups regarding the cardiac biomarkers. After PCI, the mean CRP levels and mean IL6 levels were significantly lower in the colchicine group compared to the placebo group. The present study found no significant differences in LVEF, LVEDV, LVESD, or RWMA between the two groups. No significant differences in the proportions of TIMI 2 and TIMI 3 flow between the two groups were found. IL-6 and CRP showed significant positive correlations with each other before and after PCI. **Conclusion:** Administration of preprocedural colchicine in the current study improves the CRP and IL6 levels. Colchicine given pre-PCI reduces periprocedural myocardial injury. Lower IL-6 and CRP after PCI were considered independent favorable predictors for better TIMI flow.

Keywords: Peri-Procedural Myocardial Injury, Primary Percutaneous Coronary Intervention, Coronary Artery Disease, Cardiovascular Disease, Colchicine.

Introduction

It is evident that acute coronary syndrome (ACS) is the leading cause of morbidity and mortality worldwide. The term acute coronary syndrome (ACS) is applied to patients in whom there is suspicion or confirmation of acute myocardial ischemia or infarction, including either non-ST-elevation ACS or ST-elevation ACS [1].

ST-elevation ACS is the result of transmural ischemia that involves the full thickness of the myocardium, whereas non-ST-elevation ACS does not spread through all the myocardial walls. In most STEMI cases, transmural myocardial ischemia results from a total occlusion of an epicardial coronary artery. STEMI is suspected when a patient presents with chest pain and persistent ST-segment elevation in two or more anatomically contiguous ECG leads. In addition, STEMI should be suspected if the clinical presentation is compatible and the ECG trace shows left bundle branch block (LBBB) and no ST-segment elevation, as in some cases total coronary occlusion manifests as LBBB [2]. By contrast, ECG findings of ST-segment depressions, T-wave inversions, or transient ST-segment elevations are suggestive of non-ST-segment elevation ACS and may reflect NSTEMI or unstable angina [3].

Regarding ACS, however, despite clear benefits, treatment with coronary stents is not without consequence. In addition to the standard procedural complications (dissection, side branch loss, etc.), PCI can activate multiple pathways that can have unintentional harmful consequences leading to peri-procedural myocardial infarction (PPMI) and injury (PM-injury), which are associated with poorer outcomes [4]. Rather than being a benign event, evidence demonstrates that peri-procedural myocardial injury is associated with higher rates of both short-term and long-term cardiovascular events [5].

Inflammation is associated with all facets of coronary disease, from atherosclerotic plaque formation to the pathophysiology of ACS and to worse prognosis [6]. Recently, COLCOT (Colchicine Cardiovascular Outcomes Trial) and LoDoCo-2 (Low Dose Colchicine for Secondary Prevention of Cardiovascular Disease) trials have demonstrated a potential benefit in targeting inflammation to improve patient outcomes [7]. Intriguingly, the COLCOT Trial also suggested that the benefit of colchicine was greater the earlier the drug was administered [8].

More recently, the Colchicine-PCI trial randomized 198 ACS and 202 patients with stable angina (SA) to 1.2 mg colchicine 1 to 2 hours before coronary angiography and 0.6 mg up to one hour post-PCI. They found colchicine did not affect PCI-related myocardial injury and did not attenuate the increase in interleukin-6 (IL-6) and high-sensitivity C-reactive protein (hsCRP) at 8 hours; however, it did attenuate the increase in IL-6 and hsCRP at 24 hours [9]. So, the aim of the study was to study the effect of colchicine given pre-PCI on post-PCI-induced myocardial injury within 24 hours of the index PCI procedure among patients with ACS who underwent primary PCI.

Patients and Methods

This study was conducted from March 2023 to December 2023

This prospective interventional study included 200 patients with a diagnosis of acute coronary syndrome who underwent primary PCI and were admitted to Cardiology Department in Benha University Hospital and National Heart Institute. The study population was divided into two groups; group 1 (patient group) included patients who received colchicine, and group 2 (control group) included patients who received placebo. All patients received colchicine (1 mg followed by 0.5 mg one hour later) or placebo before and 24 hours after PCI.

We included in this study patients with Acute coronary syndrome (ACS) intended

for primary PCI with symptoms onset less than 24 hours and patients who had a de-novo lesion amenable to PCI, and high-sensitive (hs) troponin-I and CK (creatinine kinase) had peaked and stabilized but we excluded patients who had active inflammation/infection, patients who had prior ACS within 6 months, patients who had severe renal impairment (creatinine clearance <45 mL/ min), patients with preexisting cardiomyopathy, patients with Moderate and severe valvular heart disease, patients with late presentation after symptom onset (more than 24 hours from onset of chest pain) and patients with atrial fibrillation, paced rhythms or other conditions that may hamper the quality of obtained echocardiographic data.

Methods

On admission, all patients were subjected to a full history that included personal history (name, age, cigarette smoking), medical history (hypertension, diabetes mellitus, hyperlipidemia), family history of premature coronary artery disease (CAD), and surgical history (previous PCI).

The physical examination included an assessment of vital signs (pulse, temperature, blood pressure, and central venous pressure), a full cardiac examination, a full systemic examination for other associated medical or surgical problems, and body mass index. Every patient had a standard 12-lead ECG examination.

Laboratory investigations included random blood sugar, cardiac biomarkers (hs troponin, CK, CK–MB, and LDH) estimated on admission, immediately pre and 24 hours post PCI, C-reactive protein and interleukin 6 immediately pre and 24 hours post PCI, and kidney function tests including urea and creatinine.

Transthoracic echocardiography (TTE) was done on every patient to assess left ventricular ejection fraction (LVEF), left ventricular end-diastolic volume (LVEDV), left ventricular end-systolic volume (LVESV), and regional wall motion abnormalities before hospital discharge.

Ethical Consideration

informed consent was obtained from patients before enrollment in the study. An approval from the Research Ethics Committee in Benha Faculty of Medicine was obtained, code & # Ms 35-4-2023

Statistical Analysis

The collected data was revised, coded, and tabulated using the Statistical Package for Social Science (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0.Armonk, NY: IBM Corp.). Data were presented, and suitable analysis was done according to the type of data obtained for each parameter. Mean, standard deviation (± SD), median, and range were used for numerical data. Frequency and percentage were used for non-numerical data. The Student-T test was used to assess the statistical significance of the difference between the two study group means. The Paired-T test was used to assess the statistical significance of the difference of a parametric variable between two time periods. A Chi-Square test was used to examine the relationship between two qualitative variables. The Fisher Exact test was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells. The probability of results is considered significant if <0.05 at confidence interval of 95%. differences between the groups for HTN (p=0.108), DM (p=0.885), hyperlipidemia (p=0.845), family history (p=0.707) previous PCI (p=1), smoking (p=0.874), HF (p=1.000), and stroke.

Results

Table (1) shows that there were no significant differences in sex, age, and BMI between the colchicine and placebo groups. There were no significant

Table (1): Comparing the two studied groups regarding baseline characteristics, and clinical history.

	Colchicine N = 100		**Placebo N = 100**		**Test**	**P value**
	No.	**%**	**No.**	**%**		
Sex						
Male	81	81.0	82	82.0	X^2= 0.033	0.856
Female	19	19.0	18	18.0		
Age (years)						
Mean ± SD	49.97 ± 7.06		50.50 ± 7.50			
Median	49.0		50.0		t= 0.514	0.608
Min. – Max	38.0 – 68.0		37.0 – 86.0			
BMI (kg/m^2)						
Mean ± SD	29.42 ± 1.53		29.10 ± 1.72			
Median	29.40		28.60		t= 1.392	0.166
Min. – Max	27.20 – 33.0		27.0 – 33.40			
HTN						
No	15	15.0	24	24.0	X^2= 2.580	0.108
Yes	85	85.0	76	76.0		
DM						
No	40	40.0	41	41.0	X^2= 0.021	0.885
Yes	60	60.0	59	59.0		
Hyperlipidemia						
No	15	15.0	21	21	X^2= 1.220	0.269
Yes	85	85.0	79	79		
Family history						
No	82	82.0	84	84.0	X^2= 0.142	0.707
Yes	18	18.0	16	16.0		
Previous PCI						
No	100	100.0	99	99	FE= 1.005	1.0
Yes	0	0.0	1	1		
History of CAD						
No	80	80.0	83	83.0	X^2= 0.298	0.585
Yes	20	20.0	17	17.0		
Smoking						
No	27	27.0	28	28.0	X^2= 0.025	0.874
Yes	73	73.0	72	72.0		
HF						
No	100	100.0	99	99.0	X^2= 1.005	FE 1.000
Yes	0	0.0	1	1.0		
Stroke						
No	100	100.0	100	100.0	–	–
Yes	0	0.0	0	0.0		

SD.: Standard deviation, Min.: Minimum, Max.: Maximum, t: Student t test, X^2: Chi–Square, FE: Fisher Exact, p: Comparing the two studied groups

Table (2) shows that there were no significant differences found regarding anterior, inferior, lateral STEMI between both groups. None of the studied cases had Posterior STEMI or UA. There were no significant differences in SBP (118.1 mmHg vs. 118.7 mmHg, p=0.796), DBP (76.80 mmHg vs. 77.0 mmHg, p=0.913), temperature (37.37°C vs. 37.32°C, p=0.101), and HR (91.12 beats/minute vs. 91.87 beats/minute, p=0.621) between the two groups. The mean RBG was slightly lower in the colchicine group compared to the placebo group (158.9 mg/dL vs. 166.0 mg/dL), but the difference was not statistically significant (p>0.05).

Table (2): Comparing the two studied groups regarding diagnosis, hemodynamics and RBG

	Colchicine N = 100		**Placebo N = 100**		**Test**	**p**
	No.	**%**	**No.**	**%**		
STEMI vs. NSTEMI						
STEMI	100	100.0	100	100.0	–	–
NSTEMI	0	0.0	0	0.0		
Anterior STEMI						
Negative	39	39	48	48.0	X^2=1.648	0.199
Positive	61	61	52	52.0		
Inferior STEMI						
Negative	65	65	58	58.0	X^2=1.035	0.309
Positive	35	35	42	42.0		
Lateral STEMI						
Negative	87	87.0	88	88.0	X^2=0.046	0.831
Positive	13	13.0	12	12.0		
Posterior STEMI						
Negative	100	100.0	100	100.0	–	–
Positive	0	0.0	0	0.0		
SBP (mmHg)						
Mean ± SD.	118.1 ± 16.59		118.7 ± 13.20			
Median	120.0		120.0		t= 0.259	0.796
Min. – Max.	80.0 – 150.0		90.0 – 150.0			
DBP (mmHg)						
Mean ± SD.	76.80 ± 13.99		77.0 ± 11.68			
Median	80.0		80.0		t= 0.110	0.913
Min. – Max.	50.0 – 100.0		50.0 – 100.0			
Temperature						
Mean ± SD.	37.37 ± 0.19		37.32 ± 0.31			
Median	37.40		37.40		t= 1.647	0.101
Min. – Max.	37.0 – 37.60		36.0 – 37.80			
HR (beats/minute)						
Mean ± SD.	91.12 ± 9.91		91.87 ± 11.45			
Median	93.0		93.50		t= 0.495	0.621
Min. – Max.	56.0 – 110.0		65.0 – 120.0			
RBG						
Mean ± SD.	158.9 ± 39.09		166.0 ± 32.58			
Median	157.0		168.0		t=1.403	0.162
Min. – Max.	96.0 – 290.0		106.0 – 240.0			

SD.: Standard deviation, Min.: Minimum, Max.: Maximum, t: Student t test, X^2: Chi–Square, p: Comparing the two studied groups, *: Significant when p<0.05.; RBG : Random blood glucose (mg/dl)

Table (3) compares the levels of IL6 between the colchicine and placebo groups. The mean IL6 levels before PCI were similar in both groups (82.08 pg/mL vs. 80.06 pg/mL, p>0.05), with no significant differences. The comparison of IL6 before and after PCI showed significant differences in IL6 levels in both groups (p<0.001 for each group). However, after PCI, the mean IL6 levels were significantly lower in the colchicine group compared to the placebo group (72.54 pg/mL vs. 83.90 pg/mL, p<0.001). These findings suggest that colchicine may have a beneficial effect in reducing IL6 levels after PCI. Before PCI, there were no significant differences in the mean CRP levels between the two groups (24.65 mg/L vs. 24.78 mg/L, p=0.734). The comparison of CRP before and after PCI

revealed significant differences in CRP levels in both groups ($p<0.001$ for each group). However, after PCI, the mean CRP levels were significantly lower in the colchicine group compared to the placebo group (10.28 mg/L vs. 43.65 mg/L, $p<0.001$). These results suggest that colchicine may effectively reduce CRP levels after PCI.

Table (3): Comparing the two studied groups regarding IL6 and CRP

IL6 (PG/ml)	**Colchicine N = 100**	**Placebo N = 100**	**Test**	**p1**
Before PCI				
Mean ± SD.	82.08 ± 4.49	81.27 ± 4.61	t1= 1.258	0.210
Median	83.0	82.50		
Min. – Max.	70.0 – 88.0	70.0 – 88.0		
After PCI				
Mean ± SD.	72.54 ± 3.77	80.06 ± 4.24	t1= 20.286*	<0.001*
Median	72.0	81.0		
Min. – Max.	64.0 – 82.0	73.0 – 91.0		
Test	t2=26.606*	t2=15.765*		
p2	<0.001*	<0.001*		
CRP (mg/L)				
Before PCI				
Mean ± SD.	24.65 ± 2.69	24.78 ± 2.71	t1= 0.340	0.734
Median	25.0	25.0		
Min. – Max.	20.0 – 29.0	20.0 – 30.0		
After PCI				
Mean ± SD.	10.28 ± 1.75	43.65 ± 5.41	t1= 58.650*	<0.001*
Median	10.0	45.0		
Min. – Max.	6.0 – 15.0	29.0 – 50.0		
Test	t2=43.441*	t2=33.277*		
p2	<0.001*	<0.001*		

SD.: Standard deviation, Min.: Minimum, Max.: Maximum, t1: Student t test, t2: Paired t test, p1: Comparing the two studied groups, p2: Comparing before and after PCI, *: Significant when $p<0.05$.

Table (4): Comparing the two studied groups regarding echo data.

	Colchicine N = 100		**Placebo N = 100**		**Test**	**p**
LVEF Normal range(>55%)						
Mean ± SD.	58.14 ± 4.03		57.76 ± 4.99		t= 0.602	0.548
Median	58.30		58.0			
Min. – Max.	50.80 – 64.80		43.0 – 73.0			
LVEDV normal range(35-57) ml						
Mean ± SD.	4.73 ± 0.53		4.86 ± 0.59		t= 1.603	0.110
Median	4.65		4.80			
Min. – Max.	3.0 – 5.70		3.60 – 6.70			
LVESV normal range (22 - 40) ml						
Mean ± SD.	3.20 ± 0.66		3.32 ± 0.66		t= 1.262	0.208
Median	3.10		3.40			
Min. – Max.	0.20 – 4.30		2.0 – 5.10			
RWMA	**No.**	**%**	**No.**	**%**	X^2= 0.0	1.000
Negative	71	71.0	71	71.0		
Positive	29	29.0	29	29.0		

SD.: Standard deviation, Min.: Minimum, Max.: Maximum, t: Student t test, X^2: Chi–Square test, p: Comparing the two studied groups.

Table (4) compares the echocardiographic data between the colchicine and placebo groups. There were no significant differences in LVEF, LVEDV, LVESD and RWMA between the two groups (p>0.05 for each). Table **(6)** examines the coronary angiography data between the colchicine and placebo groups.

There were no significant differences in the number of diseased vessels, involvement of specific coronary arteries, and the number of stents used between the two groups (p>0.05 for each). There were no significant differences in the proportions of TIMI 2 and TIMI 3 flow between the two groups (p>0.05). Although colchicine group showed higher incidence of TIMI3 when compared to placebo group.

Discussion

Acute coronary syndrome (ACS) is defined as reduced blood flow to the coronary myocardium manifesting as ST-segment elevation myocardial infarction or non-ST-segment elevation ACS, which includes unstable angina and non-ST-segment elevation myocardial infarction [10]. It is a type of coronary heart disease (CHD), which is responsible for one-third of total deaths in people older than 35 years old [11].

Percutaneous coronary intervention (PCI) is an invasive, yet non-operative procedure designed to alleviate the constriction or blockage of the coronary artery, thus enhancing blood flow to the heart muscle. PCI is essential in managing coronary artery disease (CAD) [12].

Vascular injury during percutaneous coronary intervention (PCI) induces rapid neutrophil recruitment to the site of mechanical trauma. The subsequent inflammatory cascade can be detected as early as one hour after PCI. Elevated levels of inflammatory biomarkers in the setting of PCI are associated with endothelial dysfunction and microvascular obstruction and remains an independent predictor of subsequent major adverse cardiovascular events (MACE) even in the contemporary era of second-generation drug-eluting stents. Inflammation during PCI may also increase the risk of PCI-related myocardial injury, which is associated with long-term all-cause mortality [13].

Colchicine directly inhibits neutrophil chemotaxis and activity in response to vascular injury, produces inhibitory effects on the inflammasome and reduces neutrophil-platelet aggregates, which may accumulate in the microvascular beds during acute myocardial infarction (MI) and contribute to myocardial injury after PCI. A treatment of colchicine currently used for the treatment of gout flares has rapid anti-inflammatory effects and an adverse event profile comparable to placebo [14]. So, the aim of the study was to Study the effect of colchicine given pre-PCI on post-PCI- induced myocardial injury within 24 hours of the index PCI procedure among patients with ACS who underwent primary PCI.

This pre-post interventional clinical trial included 200 patients with a diagnosis of ACS and underwent primary PCI, who were admitted to Cardiology Department in Banha University Hospital and National Heart Institute. The study population was divided into two groups, Group 1 (patient group) included patients who received colchicine. Group 2 (control group) included patients who received placebo.

Regarding the demographic and anthropometric data of the present study**,** both groups were matched regarding age, gender and BMI. The current study revealed no significant differences between the two groups regarding baseline and clinical parameters such as hypertension (85% in colchicine group versus 76 % for placebo), DM (60% versus 59%), hyperlipidemia (85% versus79%), family history of MI (18% versus 16 %), previous PCI (0% versus 1 %), smoking (73% versus 72%), HF, and stroke.

The baseline demographic and clinical characteristics of 400 subjects who underwent PCI were examined and found that there were no differences between the colchicine and placebo groups. A majority of the subjects were male, 76% were white, and 21% were of Hispanic ethnicity. Cardiovascular risk factors were common, with hypertension, hyperlipidemia, and DM in 92%, 89%, and 58% of subjects, respectively. Prior MI was reported in 26% of subjects, prior coronary revascularization in more than a third, and renal insufficiency in 21% [9].

The current study found that all studied cases were subjected to STEMI (100%) with no significant differences regarding anterior, inferior, lateral STEMI between both groups.

In 2023, a recent study was done on 356 patients and revealed that individuals aged 48 and higher were substantially more likely to get ACS. Males were more likely to develop ACS. NSTEMI (51.69 %) was substantially more prevalent than STEMI (29.49 %) and unstable angina (18.82 %). Most patients (49.16 %) belonged to the NYHA Stage 2 functional class, as compared to Stage 1 (29.49 %) and Stage 3 (23.88 %). The vast majority of patients (33.43 %) have Grade 1 and Grade 2 SOB (28.93 %) [15].

The present study revealed no significant differences in vital signs, renal function, liver functions and electrolyte levels between the two groups. The present study revealed that the mean RBG was slightly lower in the colchicine group compared to the placebo group (158.9 mg/dL versus 166.0 mg/dL), but the difference was not statistically significant. Similarly, a study also found that mean RBG was slightly lower in the colchicine group compared to the control group with no significant differences [16].

The current study revealed no significant variations between the colchicine and placebo groups regarding the cardiac biomarkers (c-KMB and troponin). Again the former study performed in 2021 also found that there were no differences in total CK release at admission, 6 hours, 24 hours, and 48 hours between groups, with no significant differences between groups regarding inflammatory biomarkers at admission, 24 hours, and 48 hours [16].

The current study revealed that the mean IL6 levels before PCI were similar in both groups (82.08 pg/mL versus 80.06 pg/mL), with significant differences between both groups after PCI, the mean IL6 levels were significantly lower in the colchicine group compared to the placebo group (72.54 pg/mL versus 83.90 pg/mL). Colchicine may have a beneficial effect in reducing IL6 levels after PCI.

This is in agreement with the results declared by other scientists who demonstrated a marked reduction in local IL-6 production as well as venous levels with colchicine, suggesting a potential role for colchicine in reducing the risk of cardiovascular events, as colchicine therapy in ACS patients resulted in a lower CS concentration of IL-6 versus untreated patients. In stable CAD patients, colchicine treatment was associated with a very low IL-6 trans coronary gradient. Also, IL-6 venous levels did significantly change with colchicine administration [17].

The study done in 2020 was the first to evaluate the effects of an acute pre-procedural administration of colchicine versus placebo on markers of myocardial injury and inflammation in patients undergoing PCI. The most findings were that pre-procedural administration of colchicine did not lower the risk of PCI-related myocardial injury, PCI-related MI, or MACE when compared with placebo, but did significantly attenuate the increase in IL-6 and hs-CRP concentrations 22–24 hours post-PCI when compared to placebo [9].

The present study revealed that before PCI, there were no significant differences in the mean CRP levels between the two groups. However, after PCI, the mean CRP levels were significantly lower in the colchicine group compared to the placebo

group (10.28 mg/L versus 43.65 mg/L), which suggests that colchicine may effectively reduce CRP levels after PCI. In line with others, who reported that colchicine was administered after PCI in their study. The hs-CRP levels decreased significantly at 24 hours and at 1 month [18].

A metanalysis on 1636 patients who received colchicine for the prevention of major adverse cardiovascular events in patients with the ACS and CCS. They reported a weak negative correlation between change in CRP and clinical events. While colchicine treatment resulted in a greater reduction in hs-CRP levels compared with placebo [19].

The current study found no significant differences in LVEF, LVEDV, LVESD and RWMA between the two groups. There were no significant differences in the number of diseased vessels, involvement of specific coronary arteries, and the number of stents used between the two groups.

The results gained in the study done by a group of researchers in 2021 showed that short-term oral colchicine treatment at high doses given at the time of reperfusion in patients who have acute STEMI did not reduce infarct size in comparison with placebo. There was also no significant change in other indices of myocardial damage such as microvascular obstruction and LV remodeling. However, there was an increase in the incidence of LV thrombus in patients receiving colchicine compared with those receiving placebo, without evidence of subsequent adverse clinical outcomes [16].

A study demonstrated that colchicine confers a risk reduction of in repeat vessel revascularization when used in patients who underwent PCI [20]. The anti-inflammatory and antiproliferative properties of colchicine likely benefit repeat intervention at both the site of index PCI and de novo lesions caused by ongoing atherosclerotic disease [21].

The current study revealed no significant differences in the proportions of TIMI 2 and TIMI 3 flow between the two groups. Although colchicine group showed higher incidence of TIMI3 when compared to placebo group.

Meta-analysis of previous studies showed a significant reduction in repeat vessel revascularization when colchicine was used for patients who underwent PCI. Furthermore, there was also a significant reduction in stent thrombosis when colchicine was given to patients who underwent PCI [22, 23].

The present study revealed that, among all studied cohort, IL-6 and CRP showed significant positive correlations with each other before and after PCI. Colchicine features an original anti-inflammatory mechanism of action combining tubulin disruption, inhibition of NLRP3 inflammasome, and stimulation of dendritic cell maturation and antigen presentation, these mechanisms were more likely to induce a more favorable modulation of the immune-inflammatory response than a targeted cytokine inhibition [24].

The current study revealed that lower IL-6 and CRP after PCI were considered independent favorable predictors for better TIMI. A metanalysis conducted on 6154 patients with CAD, the colchicine group was not associated with statistically significant reduction of MACE, MI, all-cause mortality, cardiovascular mortality, and stroke. They suggested that colchicine was not associated with a significant decrease in cardiovascular endpoints and mortality in patients with CAD [25].

A focused meta-analysis which pooled data from the main trials on the topic showed a significant increase of non-CV death among colchicine-treated patients as compared with controls. However, this was mostly attributed to the RCTs enrolling CCS patients and no specific cause of death responsible for this excess of deaths has been identified [26].

In another trial, colchicine given earlier and at a higher dose of 0.5 mg twice a day for 1 month followed by 0.5 mg every day for 11 months after an acute coronary syndrome failed to demonstrate any benefit, and there was increased mortality in the colchicine group. This discrepancy has generated debate [27].

Regarding adverse effects associated with administration of colchicine in ACS patients, pneumonia was reported significantly more often in patients assigned to the colchicine group [8]. Others reported that in colchicine group, it was found that at the end of the enrollment, 12.5% patients had a history of gastrointestinal adverse effects caused by colchicine use in compare with 2.5% in placebo group [28].

Limitations of the present study were that the small population size, thus a lower number of patients with ST-elevation Myocardial infarction were studied. It is possible that we would have observed a different result where there had been a larger number of patients with ST-elevation Myocardial infarction. In addition, medication administered prior to PCI, success of the procedure, number of stents,use of aspiration devices and use of statins were not established in this study which may affect the results of PCI.

Conclusion

In conclusion, ACS patients exhibit increased production of inflammatory cytokines, administration of preprocedural colchicine improves the CRP, IL6 level, and had higher incidence of TIMI3 when compared to placebo group. It is suggested that colchicine could be promising therapy for CV risk reduction.

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