

THE SHORT TERM OUTCOMES OF PERCUTANEOUS CORONARY INTERVENTION AND CONSERVATIVE STRATEGY IN THE VERY ELDERLY PATIENTS WITH ACUTE MYOCARDIAL INFARCTION.

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Summary

Objective: The advantages and disadvantages of percutaneous coronary intervention (PCI) versus conservative medical treatment (CMT) for the very elderly with acute myocardial infarction are still uncertain. To determine the major adverse cardiac events in hospital and at 6 months follow-up of PCI and CMT of acute myocardial infarction (AMI) on the very elderly patients is purpose of this study. **Patients and Methods:** A descriptive study with cohort, prospective and multi centers. From June 2017 to June 2018, 275 patients (≥ 80 years old) with AMI were enrolled. All patients were divided into 2 groups included a CMT group (n=133) and a PCI group (n=142).

Results: In-hospital mortality of the CMT group was significant higher than PCI group (18.05% vs 8.45%, $p = 0.018$). The cardiovascular mortality and recurrent myocardial infarction (MI) after 6months follow-up were still significant higher in CMT group than those PCI group (respectively, 15.75% vs 8.45%, $p=0.002$; 15.75% vs 3.45%, $p=0.001$). The two strategies did not differ in term of stroke and major bleeding.

Conclusions: In treatment of AMI in the very elderly patients, PCI is superior to CMT in the reduction of in-hospital mortality and 6-month cardiovascular mortality as well as recurrent MI.

Key words: acute myocardial infarction, very elderly patients, percutaneous coronary intervention, conservative treatment.

INTRODUCTION

Elderly and very elderly people account for a large proportion of patients hospitalized for acute myocardial infarction (AMI) [1]. The life expectancy of the world's population in general and Vietnam in particular is increasing, which will lead to an increase in the proportion of very elderly people with AMI in the future.

Percutaneous coronary intervention (PCI) has been shown to improve survival prognosis in patients with AMI. However, the evidence of this benefit is mainly in young adult patients (average age of 65 years) because most studies did not include or include very few very elderly patients (≥ 80 years old) [7].

According to the guidelines of American Heart Association (AHA) and European Society Cardiovascular (ESC), patients with acute coronary syndrome should receive optimal medical treatment and evaluation for invasive reperfusion therapy strategies such as PCI. However, in fact, very elderly patients with AMI are less likely to receive PCI under the same guidelines as younger patients because many accompanying conditions as well as evidence of benefits are relatively small [2], [5], [9]. Therefore, we conducted this study to evaluate the short-term results of PCI and conservative medical treatment (CMT) on very elderly patients with acute AMI.

PATIENTS AND METHODS:

Patient selection criteria: All patients ≥ 80 years old were hospitalized by AMI at the Interventional Cardiology department of Thong Nhat hospital, Interventional Cardiology department of Medical University Center in Ho Chi Minh City, Cardiology Department of Cho Ray Hospital and Cardiology Department of 30/4 Police Hospital in Ho Chi Minh city during the period from June 2017 to June 2018 met the criteria study.

Patients with ≥ 80 years old, were diagnosed AMI according to the 3rd global definition of AMI [10]. Patients were treated PCI and CMT.

Exclusion criteria: Patients with malignant disease with life expectancy <12 months, patients died at the time of admission.

Methods: A descriptive study with cohort, prospective and multi centers. Patient records included the history, clinical, para clinical, therapeutic drugs and severe cardiovascular events on the hospitalization. Patients received conservative medical treatment either alone or in combination with PCI. Patients' major cardiovascular events on the course of the hospital administration and calling after discharge 6 months are recorded. Major cardiovascular events: all-cause mortality, cardiovascular death, AMI, stroke and severe hemorrhage as defined by AHA in 2014 clinical study [5].

The data in the study were analyzed and processed by STATA 13.0 software. The results are described in terms of frequency, percentage % for qualitative variables. For descriptive quantitative variables by means of \pm standard deviation (normal distribution), median and quartile 25% -75% (non-standard distribution); check the squared chi to determine the relationship between two qualitative variables (if there is one cell with expected value <5 accounting for a ratio of $> 20\%$ or expected value <1 then use Fisher test); test t-test to determine the relationship between the two average variables; to monitor events, vital analysis with Kaplan-Meier representations, use log-rank test to assess the difference between vital lines. The difference was statistically significant when the value of $p < 0.05$ with 95% confidence.

RESULTS

Of 275 patients who met the sampling criteria at 4 hospitals in Ho Chi Minh City were recruited in this study. In which 133 patients were medical treated and 142 patients were received PCI. Some clinical, paraclinical and therapeutic characteristics of the two groups of patients according to the treatment method are summarized in Table 1, table 2 and table 3.

Table 1. Predestined characteristics, cardiovascular risk factors according to the treatment method

	CMT (%) n = 133	PCI (%) n = 142	p
Age [years]: median (interquartile range)	84 (81:88)	83 (80:87)	0.018
Age, range / Females	76 (57.14)	72 (50.70)	0.284
Current tobacco smoking	37 (27.82)	16 (11.27)	0.001
Hypertension	97 (72.93)	91 (64.08)	0.115
Hypercholesterolemia	101 (75.94)	99 (69.72)	0.247
Diabetes mellitus	35 (26.32)	44 (30.99)	0.392
Chronic renal diseases	52 (39.10)	33 (23.24)	0.004
Prior myocardial infarction	26 (19.55)	14 (9.86)	0.023
Prior coronary artery stent	7 (5.26)	9 (6.34)	0.704
Chronic heart failure	52 (39.10)	18 (12.68)	<0.001
Cerebral vascular diseases	20 (15.04)	14 (9.86)	0.192
Chronic atrial fibrillation	12 (9.02)	3 (2.11)	0.012
Chronic obstructive pulmonary disease	19 (14.29)	16 (11.27)	0.453

Table 2.

Clinical and para clinical characteristics at the time of admission according to the treatment method

	CMT (%) n = 133	PCI (%) n = 142	p
STEMI	22 (16.5%)	42 (29.58%)	0.011
NSTEMI	111 (83.46%)	100 (70.42%)	< 0.05
Killip I on admission	64 (48.12%)	105 (73.94%)	< 0.001

Killip \geq II on admission	69 (51.88%)	37 (26.06%)	< 0.05
LVEF (% , mean)	44.46 \pm 15.75	50.21 \pm 15.04	0.002
GFR (mL/min)	53.7 (38.2 : 65)	55.9 (46 : 72)	0.05
Hematocrit (%)	35.5 (31.2 : 39.5)	36.85 (33.4 : 39.1)	0.15
Hemoglobin (g/dL)	11.9 (10.3 : 13.1)	12.2 (11.1 : 13.3)	0.048
TIMI for NSTEMI	4 \pm 0.97	4.11 \pm 0.84	0.42
TIMI for STEMI	9.13 \pm 2.28	7.82 \pm 1.5	0.006
GRACE Score	167.43 \pm 23.33	163.45 \pm 20.57	0.13
Pneumonia	49 (36.84%)	21 (14.79%)	< 0.001
Acute renal failure	29 (21.8%)	13 (9.15%)	0.004
Frailty	97 (72.93%)	75 (52.82%)	0.001

Table 3. Drugs used during hospitalization according to the treatment method

	CMT (%) n = 133	PCI (%) n = 142	p
Aspirin	126 (94.74)	142 (100)	0.006
Ticagrelor	5 (3.76)	37 (26.06)	<0.001
Clopidogrel	126 (94.74)	141 (99.3)	0.027
Anticoagulation PO	5 (3.76)	3 (2.11)	0.326
Statin	116 (87.22)	137 (96.48)	0.005
Beta-blockers	37 (33.94)	54 (41.54)	0.229
Calcium-blockers	19 (14.29)	18 (12.68)	0.696
Angiotensin-converting enzyme	100 (75.19)	121 (85.21)	0.037
Nitrate	117 (87.97)	104 (73.24)	0.002
Aldosterone antagonists	43 (32.33)	40 (28.17)	0.452
Diuretics	47 (35.34)	29 (20.42)	0.006
Enoxaparin	112 (84.21)	136 (95.77)	0.001

Table 4. The rate of MACEs in hospital

	CMT (%) n = 133	PCI (%) n = 142	p
Recurrent myocardial infarction	6 (4.51)	2 (1.41)	0.121
Stroke	2 (1.5)	0	0.14
Major hemorrhage	3 (2.26)	2 (1.41)	0.47
Death	24 (18.05)	12 (8.45)	0.018
Composite endpoint*	34 (25.56)	15 (10.56)	0.001

* Death, recurrent myocardial infarction, stroke, major hemorrhage.

There were no significant differences between the two treatment groups on the major cardiovascular events: recurrent myocardial infarction, stroke, major hemorrhage (all $p > 0.05$). However, the rate of in-hospital mortality in patients with only CMT is higher than that in the PCI group (18.05% versus 8.45%; $p = 0.018$). Composite endpoint* in patients with CMT were also higher than those in PCI (25.56% compared with 10.56%; $p = 0.001$).

Table 5. The rate of MACEs at 6 months follow-up:

	CMT (%) n = 127	PCI (%) n = 116	p
Recurrent myocardial infarction	20 (15.75)	5 (3.45)	0.001
Stroke	1 (0.78)	2 (1.72)	0.53
Major bleeding	2 (1.56)	2 (1.72)	0.67

Cardiovascular mortality	19 (15.00)	5 (4.31)	0.002
Composite endpoint*	42 (32.23)	16 (13.79)	<0.001

* Death from all causes, cardiovascular death, recurrent myocardial infarction, stroke, major bleeding. Compared with CMT, PCI reduced cardiovascular mortality (4.31% vs. 15.00%; $p = 0.002$), recurrent myocardial infarction (3.45% compared to 15.75%, $p = 0.001$) and composite endpoint* (13.79% compared with 32.23%; $p < 0.001$) at 6 months. The all-cause mortality rate, stroke and major hemorrhage had no significant differences between the two treatment strategies ($p > 0.05$).

DISCUSSION

The rate of major cardiovascular events in the hospital of 2 groups of patients according to the treatment method

The results of our study showed that patients who only received CMT alone, the PCI patients had significantly lower mortality rates (8.45% compared to 18.05%; $p = 0.018$). The difference in hospital mortality rates between the two treatment groups in our study is similar to the prospective cohort of Katsuro Kashima [6] over 77 patients aged 80 with AMI (12.5% compared to 35.5%, $p = 0.02$), subgroup analysis from the GRACE study of Devlin G [3] over 3,029 patients > 80 years of age with acute coronary syndrome (7% versus 11%; $p < 0.001$), Gierlotka study [4] on 13,707 patients ≥ 80 years with NSTEMI (5% compared with 14%; $p < 0.0001$) and study Yudi's progressive cohort [11] on 101 patients aged 85 of STEMI (13% vs. 32%; $p = 0.03$).

The rate of stroke and myocardial infarction in our study was higher in patients who were only CMT compared to patients with PCI but not statistically significant (1.5% versus 0, $p = 0.142$ and 4.51% versus 1.41%, $p = 0.121$). However, in the study of Gierlotka on 13,707 patients [4], the rate of stroke and myocardial infarction was significantly higher in the conservative group than in the PCI group ($p = 0.0008$). This difference compared to the results of our study may be due to the larger Gierlotka study sample ($n = 13,707$). This result further shows the benefits of PCI to reduce the rate of stroke and re-infarction MI.

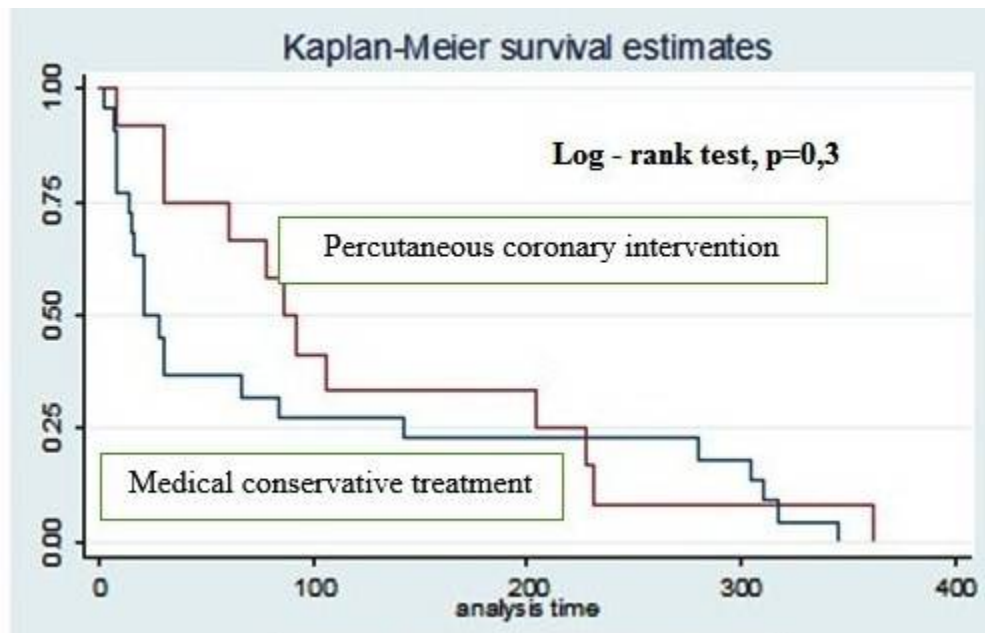
In subgroup analysis from the GRACE study of Devlin G [3] and Gierlotka [4], the prevalence of major bleeding occurred more in the PCI group compared to the group treated with CMT significantly (7% versus 3.4% with $p < 0.00001$; 2.9% versus 1.1% with $p < 0.0001$). The group of patients with PCI had higher rates of use of antiplatelet agents (aspirin, clopidogrel, ticagrelor) and anticoagulant (enoxaparin) than patients with only CMT (all $p < 0.05$); In addition, the procedure of coronary artery intervention is also a risk factor for severe bleeding. All of these may explain a higher rate of major bleeding in patients with PCI. However, in our study, the group with PCI had a lower rate of major haemorrhage than the group of patients treated with CMT but not significant (1.41% compared to 2.26%; $p = 0.47$).

At 6 month, our study showed that the group of patients treated with PCI, the group of patients who received CMT had significantly higher cardiovascular mortality, recurrent myocardial infarction (15.00% compared with 4.23%, $p = 0.002$ and 15.75% compared with 3.45%, $p = 0.001$). In the study of the author Devlin G [3], the same results were found with higher rates of myocardial infarction in the single medical treatment group (8.1% vs. 5.2%; $p = 0.03$)

Kaplan-Meier survival curve at 6 months in our study showed that the PCI has a lower all-cause mortality rate and is only 0.68 times higher than the CMT but the relationship is not statistically significant (8.45% compared to 16.54%; $p = 0.3$). In subgroup analysis from Devlin G's GRACE study [3] ($n = 3029$) and Gierlotka study [4] ($n = 13,707$), it was found that at 6 months, compared to the CMT strategy, the group of patients with PCI had significantly lower mortality rates (12% compared to 19% with $p < 0.0001$ and 16.2% compared to 32.1 % with $p < 0.0001$). Our study also noted a difference that tends to be similar to the above two authors but is not statistically significant ($p = 0.3$). This difference may be due to the sample of study. Devlin G [3] also recorded significantly lower incidence composite endpoints (death, MI and stroke) in the PCI group compared with patients with CMT (17% vs. 25%; $p < 0.0001$). Our study also recorded a significantly lower incidence of composite endpoints in the PCI group (13.79% compared with 32.23%; $p < 0.001$). This result again shows that the benefits of PCI

compared to simple medical treatment in very elderly patients (≥ 80 years) with acute myocardial infarction at 6 months.

The results of Devlin G [3] showed that patients with only CMT had a higher rate of stroke than the PCI group but this difference was not significant (3.1% compared to 2.2%, $p = 0.24$). This difference is similar to our study at 6 months ($p > 0.05$). The incidence of major bleeding at 6 months in our study did not differ significantly between the two groups of conservative and PCI medical treatments, similar to the results of author Devlin.



CONCLUSION

In treatment of AMI in the very elderly patients, PCI is superior to CMT in the reduction of in-hospital mortality and 6-month cardiovascular mortality as well as recurrent MI.

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