

IMPACT OF FRAILITY ON THE SHORT-TERM OUTCOMES IN VERY ELDERLY PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

Nguyen Van Tan¹ and Nguyen Quoc Khoa²

¹Department of Geriatrics & Gerontology, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam

²Department of Intervention Cardiology of Thong Nhat Hospital, Ho Chi Minh City, Vietnam

ARTICLE INFO

Article History:

Received 4th May, 2019

Received in revised form 25th June, 2019

Accepted 18th July, 2019

Published online 28th August, 2019

Key words:

Frailty, very elderly patients, acute myocardial infarction, major adverse cardiac events (MACEs)

ABSTRACT

Objective: The very elderly people constitute an increasingly important sector of patients admitted hospital with acute myocardial infarction (AMI). Frailty is a geriatric syndrome and its prevalence increased with age as well as cardiovascular disease, especially AMI. However, the impact of frailty on clinical outcomes in the very elderly patients with AMI is uncertain. To determine the relationship between frailty and major adverse cardiac events (all-cause death, cardiovascular death, myocardial infarction, stroke and major bleeding) in hospital and at 6 months in the very elderly patients with AMI was carried out in this study.

Patients and Methods: An observation study with cohort, prospective and multicenter trial was done from June 2017 to June 2018. Of 275 patients (≥ 80 years old) with AMI treated at Interventional Cardiology Department of Thong Nhat Hospital, Interventional Cardiology department of Medical University Hospital of Ho Chi Minh City, Cardiology Department of Cho Ray Hospital and Cardiology Department of 30/4 Police Hospital in Ho Chi Minh City were enrolled. Frailty was defined according to the Canada Study of Health and Aging Clinical Frailty Scale.

Results: Of 275 patients, 175 (62, 55%) were considered frailty and the rates of severe/very severe frailty accounted for 67.44%. Frailty was associated with in-hospital mortality and reinfarction MI (18,02% vs 4,85%; $p=0,002$ and 4,65% vs 0; $p=0,022$; respectively). The 6-month MACEs did not significantly differ in frail groups and non frail groups. However, patients with severe/very severe frailty were associated with 6-month all-cause and cardiovascular mortality when compare to the mild/moderate frailty group (22,41% vs 1,79% $p<0,001$ and 15,52% vs 1,79%; $p=0,007$; respectively).

Conclusions: Frailty was associated with in-hospital mortality and reinfarction MI in the very elderly patients with AMI. Patients with severe/very severe frailty were associated with 6-month all-cause and cardiovascular mortality when compare to the mild/moderate frailty group. Therefore, an assessment of frailty is very necessary to predict the short-term MACEs in such situation.

Copyright © 2019 Nguyen Van Tan and Nguyen Quoc Khoa. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Nearly 50% of patients hospitalized for acute coronary syndrome (ACS) are elderly with many comorbidities [1]. In this group, frailty accounts for about 10% of patient ≥ 65 years old and up to 25-50% of patients ≥ 80 years [2]. In the recommendation for acute coronary syndrome (ACS) treatment in the elderly, the American College of Cardiology (ACC)/American Heart Association (AHA) emphasizes the need to assess the accompanying frailty [3], [4]. However, the effect of frailty on major cardiovascular events in the very elderly patients with AMI is still unclear. Therefore, we conducted this study to investigate the relationship between weakening with severe cardiovascular events in the medium term in such patients with AMI.

Patients and Methods

An observational study with cohort, multicenter in Ho Chi Minh City, Vietnam.

All patients ≥ 80 years of age were hospitalized by AMI in Interventional Cardiology department of Thong Nhat Hospital, Interventional Cardiology Department of Medical University Hospital of Ho Chi Minh City, Cardiology Department of Cho Ray Hospital and Cardiology Department of 30/4 Police Hospital in Ho Chi Minh City from June 2017 to June 2018.

Patient Selection criteria: Patients 80 years old and over, were diagnosed with acute myocardial infarction according to the 3rd global definition [5] and agree to participate in the study.

Exclusion criteria: Patients with accompanying malignant disease or death at admission or dementia or unable to interact or exchange information.

*Corresponding author: Nguyen Van Tan

Department of Geriatrics & Gerontology, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam

The information on the history, clinical, para/subclinical, treatment and severe cardiovascular events of patients on the course of admission and during hospitalization were noted. Frailty was assessed at the time before the AMI incident that the patient was hospitalized. All patients with major cardiovascular events were followed up after discharge 6 months later.

Frailty and degree of frailty are determined by the scales developed by Dalhousie University - Canada [6]. The major cardiovascular events were reported according to the American Heart Association definition of cardiovascular events in clinical studies in 2014 [7]

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 with mean ± standard deviation, median and quartile 25% -75%; Test of squared X2, Fisher, T-test, Mann-Whitney to determine the relationship, to monitor events, vital analysis with Kaplan-Meier representations, use log-rank test to fight price difference between vital lines. The difference was statistically significant when the value of p <0.05 with 95% confidence interval.

RESULTS

During the study period, we recruited 275 patients who met the criteria for sampling at 4 cardiology departments of 4 different hospitals in Ho Chi Minh City; of which 172 (62.55%) patients are frail with severe/ very severe frailty rate of 67.44%. A number of clinical, para clinical and therapeutic characteristics of 2 frail and non-frail patient groups are summarized in Table 1, Table 2, Table 3 and Table 4.

Table 1 Frailty and degrees of frailty

		N (%)
Frailty	No	103 (37.45)
	Yes	172 (62.55)
	Mild	14 (8.14)
Degrees of frailty	Moderate	42 (24.42)
	Severe	99 (57.56)
	Very severe	17 (9.88)

Table 2 Patients Characteristics Baseline

Patients Characteristics	Frailty		P
	No (%), n = 103	Yes (%), n = 172	
Female	56 (54.37%)	92 (53.49%)	0.9
Age (TV, TPV)	80 (80 :81)	85.5 (83 : 89)	<0.001
Current smoking	15 (14.56)	38 (22.09)	0.13
Hypertension	73 (70.87)	115 (66.66)	0.49
Hyperlipidemia	73 (70.87)	127 (73.84)	0.59
Diabetes	28 (27.18)	51 (29.65)	0.66
Chronic renal failure	27 (26.21)	58 (33.72)	0.19
Prior myocardial infarction	14 (13.59)	26 (15.12)	0.73
Prior coronary stent	6 (5.83)	10 (5.81)	0.99
Chronic heart failure	19 (18.46)	51 (29.65)	0.039
Cerebrovascular disease	16 (15.53)	18 (10.47)	0.22
Chronic atrial fibrillation	2 (1.94)	13 (7.56)	0.047
Chronic obstructive pulmonary disease	9 (8.74)	26 (15.12)	0.13
STEMI	24 (23.3)	40 (23.26)	0.99
Killip ≥ II on admission	39 (37.86)	75 (43.6)	0.35
LVEF (%)	47.5 ± 16.4	47.4 ± 15.2	0.97
GFR (mL/min)	58.3 (46 : 69)	53.28 (39 : 68,1)	0.037
Hematocrit (%)	36.8	36.45	0.24
Hemoglobin (g/dL)	12.3 (10.9 : 13.5)	11.95 (10.5 : 13.1)	0.07
TIMI for NSTEMI	3.9 ± 0.74	4.1 ± 0.99	0.13
TIMI for STEMI	7.8 ± 2.12	8.5 ± 1.71	0.2
GRACE score	158 ± 20.5	169.8 ± 21	<0.001
Pneumonia	17 (16.5)	53 (30.81)	0.008
Acute renal failure	6 (5.83)	36 (20.93)	0.001

Aspirin	102 (99.03)	166 (96.51)	0.2
Clopidogrel	100 (97.09)	167 (97.09)	0.99
Statin	98 (95.15)	155 (90.12)	0.14
Beta-blocker	38 (38.78)	53 (37.59)	0.85
ACE-inhibitor	88 (85.44)	133 (77.33)	0.1
Furosemide	25 (24.27)	51 (29.65)	0.33
Percutaneous coronary intervention	67 (65.05)	75 (43.60)	<0,05

Table 3 In-hospital outcomes in the very elderly patients with AMI, by frailty

MACEs	Non-frail	Frail	p
Recurrent myocardial infarction	0	8(4.65 %)	0.022
Stroke	1 (0.97 %)	1 (0.58 %)	0.61
Major bleeding	3 (2.91 %)	2 (1.16 %)	0.273
Death	5 (4.85 %)	31 (18.02 %)	0.002
Composite endpoints*	9 (8.74 %)	40 (23.26 %)	0.002

* Death, stroke, recurrent myocardial infarction and major bleeding.

Table 4 Six-month outcomes in the very elderly patients with AMI, by frailty

MACEs	Frail	Non-frail	p
Recurrent myocardial infarction	9 (8.74 %)	17 (9.88 %)	0.75
Stroke	2 (1.94 %)	1 (0.58 %)	0.32
Major bleeding	3 (2.91 %)	1 (0.58 %)	0.15
Cardiovascular mortality	7 (6.8 %)	19 (11.05 %)	0.24
All-cause mortality	7 (6.8%)	27 (15.7%)	0.1

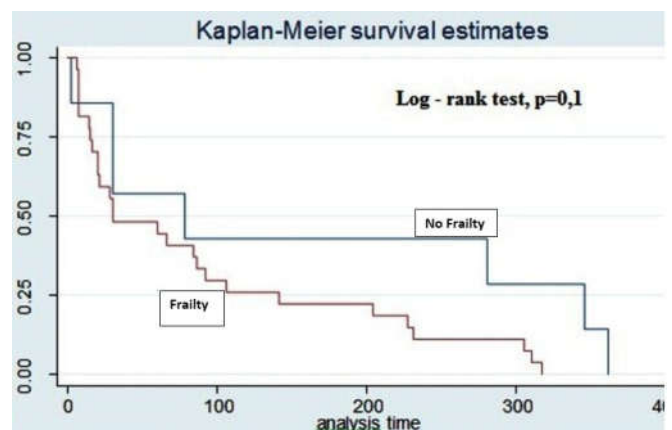
Table 5 In-hospital outcomes in the very elderly patients with AMI, by the degrees of frailty

MACEs	Degrees of Frailty		p
	Mild/Moderate	Severe/Very severe	
Recurrent MI	4 (7.14 %)	4 (3.45 %)	0.239
Stroke	1 (1.79 %)	0	0.15
Major bleeding	0	2 (1, 72 %)	0.454
Death	5 (8.93 %)	26 (22.41 %)	0.031
Composite endpoints*	9 (16.07)	31 (26.72)	0.121

* Death, stroke, recurrent myocardial infarction and major bleeding.

Table 6 Six-month outcomes in the very elderly patients with AMI, by the degrees of frailty

MACEs	Degrees of Frailty		p
	Mild/Moderate	Severe/Very severe	
Recurrent myocardial infarction	6 (10.71 %)	11 (9.48 %)	0.8
Stroke	0	1 (0.86 %)	0.67
Major bleeding	1 (1.79 %)	0	0.15
Cardiovascular mortality	1 (1.79 %)	18 (15.52 %)	0.007
All-cause mortality	1 (1.79%)	26 (22.41%)	<0.001



DISCUSSION

The relationship between frail/non-frail, the degree of frailty with major cardiovascular events

At the time of the inpatient study, our study showed that, compared with no frailty patients, frailty patients had mortality, recurrent MI, and gross events (death, myocardial infarction, stroke, and major bleeding) significantly higher. However, the rate of stroke, major hemorrhage had no significant differences between the frailty and non-weakened groups ($p > 0.05$).

The study of Niklas Ekerstad [2] on patients ≥ 75 years of age with NSTEMI showed that, compared to the non-frail patients, frailty group had significantly higher intra-hospital mortality rates (10.1% vs 1.9%, $p = 0.003$). In addition, the incidence of gross events (death, myocardial infarction, major hemorrhage, stroke) was higher in the frailty patients (45.6% versus 27.2%; $p = 0.0009$). The results of this difference are similar to our research ($p < 0.05$).

Frailty relationship, the degree of frailty with major cardiovascular events at 6 months

In the Purser study [8] over 309 patients ≥ 70 -year-old multi-vessel coronary artery disease (including ACS and stable angina) to determine the correlation between frailty and mortality at 6 months. The results showed that patients with frailty had higher rate of all-cause mortality than non-frail patients (12% versus 8%; $p < 0.05$). According to another study conducted by Murali-Krisnan R [9] on 745 elderly patients (mean age 62 ± 12) to assess the effect of frailty on the patient's clinical outcome after percutaneous coronary intervention. The results showed that at 30 days and 1 year, frailty patients had a higher mortality rate than the non-frail group with $p = 0.013$ and $p < 0.001$. Thus, at 6 months, the results of our differences tend to be the same as Purser's, with a higher mortality rate inclined to the frailty group. However, the difference in our study is not as significant as Purser's. Differences in patient age, criteria for assessing frailty and coronary artery disease may be the reason for this difference. The Murali-Krisnan R study did not record severe cardiovascular events at 6 months, however, in general, studies showed that at 30 days to 1 year the mortality rate was higher on the frailty group.

CONCLUSION

Frailty was associated with in-hospital mortality and recurrent MI in the very elderly patients with AMI. Patients with severe/very severe frailty were associated with 6-month all-cause and cardiovascular mortality when compared to the mild/moderate frailty group. Therefore, an assessment of frailty is very necessary to predict the short-term MACEs in such situation.

References

1. Gale CP, *et al.* (2011). Reduced mortality in the elderly after acute coronary syndromes. The Myocardial Ischaemia National Audit Project 2003-2010. *Eur Heart J*. 2011; e381.
2. Ekerstad N., *et al.* (2011) "Frailty is independently associated with short-term outcomes for elderly patients with NSTEMI". *Circulation*, 124 (22), e2397-404
3. Amsterdam E. A., *et al.* (2014). 2014 AHA/ACC Guideline for the Management of Patients with Non-ST-Elevation Acute Coronary Syndromes. *J Am Coll Cardiol*, 64 (24), e139-e228
4. O'Gara P. T., *et al.* (2013). 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: executive summary. *J Am Coll Cardiol*, 61 (4), e485-510
5. Thygesen K., *et al.* (2012). "Third universal definition of myocardial infarction". *Circulation*, 126 (16), e2020-35
6. Dent E., *et al.* (2016) "Frailty measurement in research and clinical practice: A review". *Eur J Intern Med*, 31, 3-10
7. Hicks K. A., *et al.* (2015). 2014 ACC/AHA Key Data Elements and Definitions for Cardiovascular Endpoint Events in Clinical Trials. *J Am Coll Cardiol*, 66 (4), e403-69
8. Purser J. L., *et al.* (2006) "Identifying frailty in hospitalized older adults with significant coronary artery disease". *J Am Geriatr Soc*, 54 (11), e1674-81.
9. Murali-Krishnan R., *et al.* (2015) "Impact of frailty on outcomes after percutaneous coronary intervention: a prospective cohort study". *Open Heart*, 2 (1), e000294.

How to cite this article:

Nguyen Van Tan and Nguyen Quoc Khoa (2019) 'Impact of Frailty on the Short-Term outcomes in Very Elderly Patients with Acute Myocardial Infarction', *International Journal of Current Medical and Pharmaceutical Research*, 05(08), pp 4465-4467.
