

Acute Myocardial Infarction in Elderly Chinese

A Clinical Analysis of 631 Cases and Comparison with 389 Younger Cases

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SUMMARY

The purpose of this study was to define the clinical features of acute myocardial infarction in a group of elderly Chinese. The presenting symptoms, complications and mortality of acute myocardial infarction were compared in 631 patients (430 men and 201 women) aged 60 and over and 389 patients (333 men and 56 women) whose ages were under 60 years. The incidence of painless myocardial infarction was 17.6% in the elderly versus 5.9% in the younger group. Typical chest pain was present in 63.1% of the elderly and 84.3% of the younger Chinese. However, the incidence of other nonspecific presenting symptoms was higher in the elderly group. Likewise, the major complications in the elderly group were more severe than those in the younger group. For example, the incidences of cardiogenic shock, heart failure, arrhythmia, pulmonary infection and cardiac rupture in the older group were 19.8, 24.2, 77.2, 22.0 and 4.4%, versus 15.1, 19.5, 48.1, 9.5 and 1.1% in the younger group, respectively. The immediate (4 week) mortality rate of the older group was 21.9% (over 80 years 51.5%), but was only 11.0% in the younger group. Although the incidences of hypertension and pulmonary disease were significantly greater in the elderly group, these diseases alone did not account for the higher mortality rate in the elderly.

Additional Indexing Words:

Myocardial infarction Elderly Chinese

THE clinical syndrome of acute myocardial infarction is not well characterized in the elderly Chinese population although several recent studies have dealt with this problem.¹⁾⁻³⁾ In order to clarify the clinical features of acute myocardial infarction, this study examined the records of Chinese patients with documented myocardial infarction at three hospitals. The pres-

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enting symptoms, complications, mortality rate and the incidence of coexistent disease were compared between the young (<60 years) and the elderly (≥ 60 years) patients in this large cohort.

PATIENTS AND METHODS

The clinical records of patients admitted to three Chinese hospitals between January 1960 and June 1984 were retrospectively reviewed. One thousand and twenty patients were identified using World Health Organization criteria⁴⁾ as having documented acute myocardial infarction.⁴⁾ Briefly, each patient had to meet at least 2 of 3 major criteria: positive history, positive EKG, and/or elevated serum enzymes. Among these, 631 patients were 60 years of age or older (elderly group) and 389 patients were under 60 (young group). The age range of the elderly group (631 cases) was 60–92 and the mean age 69.2. That of the younger group (389 cases) was 30–59, mean 50.2. The age distribution and sex ratio are listed in Table IV. The male predominance was due to the fact that two of the three hospitals were army institutions. All patients in this study were followed and treated in-hospital for 4 weeks or more. Mortality rates are based on in-hospital deaths. Statistical analyses were performed using paired t-test analysis.

RESULTS

The presenting symptoms of both groups are compared in Table I. Typical chest pain was the dominant feature of acute myocardial infarction in both groups. Eighty-four percent of the young group presented with this symptom whereas significantly less, 63.1% of the elderly group, had typical chest pain. In fact, atypical chest pain (20.3% versus 9.8%) and painless infarction (17.6% vs 5.9%) were significantly more prevalent in the elderly group. The elderly group presented with a significantly higher incidence of several nonspecific symptoms, for example dyspnea (24.2% vs 3.3%) and gastrointestinal upset (20.9% vs 9.2%).

The incidences of major complications are compared in Table II. Except for cardiac failure, shock and aneurysm, which were not significantly increased in the elderly, most major complications, e.g. arrhythmia and cardiac rupture, were significantly increased in the elderly group. Table III shows the incidence of specific arrhythmias in the 2 groups. The incidence of all arrhythmias was either significantly higher in the elderly or essentially the same for both groups.

Mortality rates for both groups are compared by age and by sex in Table

Table I. Incidence of Frequency of Presenting Symptoms of AMI

Symptom	Young patients		Elderly patients		p value
	N	%	N	%	
Typical pain	328	84.3	398	63.1	<0.001
Atypical pain	38	9.8	128	20.3	<0.001
No pain	23	5.9	111	17.6	<0.001
Dyspnea	13	3.3	153	24.2	<0.001
Cold sweat & pallor	67	17.2	157	24.8	<0.005
Cerebral symptoms	4	0.1	31	4.9	<0.005
Weakness (fatigue)	91	23.3	149	23.6	NS
Pulmonary infection	37	9.5	123	19.4	<0.001
Nausea and/or vomiting	36	9.2	132	20.9	<0.001
Palpitation	35	8.9	77	12.3	NS
Prostration	0	0.0	28	4.4	<0.001

Table II. Incidence of Major Complications

Complication	Young patients		Elderly patients		p value
	N	%	N	%	
Cardiac failure	76	19.5	153	24.2	NS
Shock	59	15.1	125	19.8	NS
Arrhythmia	187	48.1	487	77.2	<0.001
Pulmonary infection	37	9.5	139	22.0	<0.001
Papillary muscle dysfunction	7	1.8	30	4.8	<0.05
CVD*	3	0.8	36	5.7	<0.001
Cardiac rupture	4	1.1	28	4.4	<0.005
G. I. bleeding	1	0.3	25	4.0	<0.001
Aneurysm	5	1.3	13	2.1	NS
Renal failure	0	0.1	7	1.1	<0.05
Multiple**	15	3.9	97	15.4	<0.001

* Cerebral vascular disease, including stroke.

** Complicated by two or more major complications.

IV. The mortality rate of the elderly group was significantly higher than that of the younger group, 21.9% versus 11.0%. Mortality significantly increased with age according to decade in the elderly group, but not in the young group. The male to female ratio was 6: 1 in the young group versus 7: 1 in the elderly group, however, this difference in populations did not affect mortality.

The mortality rates due to acute myocardial infarction in both groups are shown in Table V for patients with co-existing disease. Both hypertension and pulmonary disease were twice as common in the elderly group. There

Table III. Incidence of Major Arrhythmia

Types of arrhythmia	Young patients		Elderly patients		p value
	N	%	N	%	
Ventricular extrasystole	86	22.1	317	50.2	<0.01
Ventricular tachycardia	11	2.8	28	4.4	NS
Ventricular fibrillation	8	2.0	34	5.3	<0.05
Junctional extrasystole	7	1.7	13	1.0	NS
Ectopic junctional tachycardia	6	1.5	6	0.9	NS
Atrial extrasystole	12	3.0	110	17.4	<0.001
Atrial tachycardia	23	5.9	48	7.6	NS
Atrial fibrillation	6	1.5	91	14.4	<0.001
Atrial flutter	0	0	14	2.2	<0.005
I° AVB	9	2.3	30	4.7	NS
II° AVB	11	2.8	45	7.1	<0.005
III° AVB	5	1.2	30	4.7	<0.005
LBBB	2	0.5	17	2.6	<0.005
RBBB	8	2.0	22	3.4	NS
LAHB	15	3.8	37	5.8	NS
RBBB-LAHB	4	0.1	15	2.3	NS

Table IV. Mortality Rate According to Age and Sex

Age	No. of patients		No. of deaths		% Mortality	
	Male	Female	Male	Female	Male	Female
Young patients						
30-39	23	5	2	0	8.7	0
40-49	115	16	12	2	10.4	12.5
50-59	195	35	17	10	8.9	28.5
Subtotal	333	56	31	12	9.5	21.4
Total	389		43		11.0	
Elderly patients						
60-69	313	87	51	14	16.2	16.0**
70-79	106	92	32	24	30.1	26.0**/**
80 and over	11	22	5	12	45.5	54.5***
Subtotal	430	201	88	50	20.4	24.8
Total	631		138		21.9*	

* $p < 0.001$, ** $p < 0.005$, *** $p < 0.05$.

were no significant differences in mortality between the 2 groups. However, patients in the younger group with co-existing diseases had higher mortality rates than their group as a whole (refer to Table IV).

Table V. Relationship between Co-existing Disease and Mortality

Disease	Young patients		Elderly patients		p value	Young patients		Elderly patients		p value
	N	%	N	%		N	%	N	%	
Hypertension	84	21.6	314	49.8	<0.001	16	19.0	62	19.8	NS
Diabetes mellitus	24	6.2	53	8.4	NS	5	20.8	12	22.6	NS
CVD	27	7.0	67	10.6	NS	8	29.6	19	28.4	NS
Old MI	41	10.5	73	11.6	NS	10	24.4	20	27.4	NS
Chronic bronchitis and/or cor pulmonale	24	6.2	108	17.1	<0.001	4	16.7	24	22.2	NS
RHD	0	0.0	2	0.3	NS	0	0.0	1	50.0	NS

DISCUSSION

This study has examined a large cohort of patients with documented acute myocardial infarction. A comparison of the young patients (<60 years old) and the elderly patients (≥ 60 years old) has revealed several significant differences between these 2 groups. The elderly group had significantly higher incidences of "painless" presentation, nonspecific presenting symptoms, complications, mortality, and co-existing hypertension and pulmonary disease.

The "painless" presentation of acute myocardial infarction is a well recognized entity in elderly patients. In this study, 17.6% of the elderly group presented with "painless" infarction. This is 3 times the incidence of the younger group. This percentage is lower than that reported by most authors^{2),3),5)-8)} for patients of comparable age. For example, a recently published series of Chinese patients, 65 years of age and older, reported a 52.8% incidence of "painless" infarction.²⁾ The lower incidence of "painless" presentation in our study may relate to our criteria that a *negative* history for pain had to have been elicited from the patient by the attending physician at the time of presentation.

The increased incidence of nonspecific presenting symptoms in the elderly group compared to the young group was unexpected. However, the increased incidences of dyspnea, cold sweat and pallor, nausea and vomiting, and prostration cannot be readily explained. These symptoms cannot be attributed to an increased incidence of heart failure or cardiogenic shock since these complications were not increased for the elderly group (see Table II).

Although the incidences of both heart failure and cardiogenic shock were not increased in elderly patients, the incidence of arrhythmias was 1.5 times that seen in the younger group. In particular, ventricular premature beats,

atrial arrhythmias, and varying degrees of atrioventricular (except I°) and bundle branch blocks were present more often in elderly patients with acute myocardial infarction than in their younger counterparts (see Table III). These data are similar to those of Tzueih¹⁾ but are higher than the incidences reported by Liu.³⁾ Differences between our data and those reported by others may well be due to the differential use of continuous and/or serial electrocardiographic monitoring.

The incidence of other infarct related complications was increased in the elderly group. These included papillary muscle dysfunction and cardiac rupture, but not ventricular aneurysm. Cardiac rupture occurred 4 times more frequently in our elderly patients. Advanced age at the time of infarction is well known to predispose to ventricular rupture following acute infarction. Latting⁹⁾ has reported cardiac rupture as the second most common cause of death in patients with acute myocardial infarction over the age of 70. The incidence of cardiac rupture in our elderly patients (4.4%) is similar to that reported in a number of other studies.^{10)–12)}

Pulmonary infection was twice as prevalent in our elderly group as in the younger patients, and within the elderly group, this complication was the third most common (Table II). In China, pneumonia is the second most frequent cause of death in patients 70 years and older.¹³⁾ Thus, the high incidence of pneumonia in the elderly may explain the higher mortality rate observed in our elderly patients (Table IV). This complication takes on added significance as a cause of mortality in our elderly patients when the relationship of co-existing disease and mortality is also examined. Although there was an increased incidence of hypertension and chronic pulmonary disease in our elderly population, none of the co-existing diseases explained the increased mortality of these patients.

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