DIFFERENCES IN CLINICAL PRESENTATION OF ACUTE MYOCARDIAL INFARCTION BETWEEN ELDERLY AND YOUNGER PATIENTS: A THREE YEAR PROSPECTIVE STUDY IN A REGIONAL HOSPITAL

Summary

Elderly patients commonly have some unique features as compared to younger ones, but there were not much published data in Hong Kong on the differences between the two groups with respect to the clinical presentation of acute myocardial infarction. We conducted a prospective study to find out the differences between them. All patients admitted to our hospital with a diagnosis of acute myocardial infarction from April 1991 to March 1994 were studied. There were 81 patients in the elderly group (age ≥ 75 years) with a mean age of 79.9 years (range 75 - 93 years), and 231 patients in the younger group, mean age of 62.8 years (range 30 - 74 years). In the elderly group, there were significantly more female (p<0.0005). More than 90% of younger patients presented with chest pain whereas less than 80% of elderly patients presented with chest pain (p<0.002). There were significantly more elderly patients presenting with shortness of breath or syncope (p<0.005). Prior general practitioner consultation before hospital admission was significantly less common in the elderly group (p<0.05). As the presentations were different, better understanding and knowledge of them might improve the management of elderly patients with acute myocardial infarction.

Introduction

Ischaemic heart disease is an important killer among the leading causes of death in Hong Kong. It is well known that the risk of ischaemic heart disease increases with age. As the elderly population in Hong Kong is expected to increase over the next few decades, there will be an increasing number of patients presenting with acute myocardial infarction (AMI). AMI is diagnosed using World Health Organisation (WHO) criteria, i.e. when two out of three of the following features are met: 1) typical chest pain; 2) evolutional changes in electrocardiograms (ECG); 3) serial cardiac enzymes changes. The diagnosis is usually easy and straightforward. However, it is sometimes difficult, especially in situations where the presentation is not typical, e.g. in elderly patients.

Elderly patients usually have some differences as compared to younger ones in many diseases. The differences undoubtedly affect the type of care provided and also affect the subsequent prognosis. However, there were not much published data in Hong Kong on the differences between the two groups with respect to the clinical presentation of AMI.

The aim of the present prospective study was to find out the differences in AMI presentation between elderly patients equal to or above the age of 75 years and those below 75.

Patients and Method

From 1st April 91 to 31st March 94, all AMI patients admitted to our hospital were recruited. Diagnosis was made according to the WHO criteria mentioned above. Patients’ clinical information was recorded prospectively in the United Christian Hospital AMI registry forms. An age cut-off of 75 years was used to divide the patients into young and old groups. The following data were recorded by the
same group of researchers for these two age groups of patients using the same criteria:

- Site of AMI
- Sex ratio
- Past history of ischaemic heart disease (IHD)
- Past history of diabetes mellitus (DM)
- Past history of hypertension (HT)
- Past history of stroke
- Past history of hyperlipidaemia
- Major presenting symptoms as chest pain, dyspnoea, syncope or others
- Consulting general practitioners before attending hospital or not
- Time elapsed between onset of symptoms to arrival at hospital

All the above data were entered into our databank and were analyzed by Chi-square method.

Results

During the three year study period, 312 patients were recruited into the study. There were 81 patients aged equal to or above 75 years, and 231 patients aged below 75. The mean age and standard deviation of the elderly group was 79.9 ± 4.6 years (range 75 - 93 years) while that of the younger patients was 62.8 ± 8.9 years (range 30 - 74 years).

The prevalence of different sites of AMI was similar in both groups of patients. In the elderly group, there were 50 anterior, 29 inferior and 2 both anterior and inferior AMI; while in the younger group, there were 136 anterior, 87 inferior and 8 both anterior and inferior AMI. The differences did not reach statistical significance.

There were 38 males and 43 females in the elderly group while there were 159 males and 72 females in the younger group. The male to female ratio in the elderly group was 0.9 : 1 while it is 2.2 : 1 in the younger group (p< 0.0005) (Table 1). There were more patients with diabetes mellitus in the younger group (19.0%) than the elderly group (9.9%), not reaching statistical significance (p=0.057). There was no statistically significant difference in both groups in the past history of ischaemic heart disease, hypertension, stroke or hyperlipidaemia (Table 1).

The most frequent presenting symptom of AMI in the elderly group was chest pain (79.0%), followed by dyspnoea (11.1%), syncope (7.4%) and cardiac arrest (2.5%). Similar trend also occurred in the younger group although there was no patient presented with syncope in this group (Table 2). However, the percentage of patients with chest pain in the younger group was significantly higher than that in the elderly group, (91.8% vs 79.0%, p< 0.002). On the contrary, the percentage of patients presenting with dyspnoea and syncope in the younger group was significantly lower than that in the elderly group (3.0% vs 11.1% for dyspnoea, 0% vs 7.4% for syncope, p< 0.005). No statistically significant difference was observed between the two groups in patients presented with cardiac arrest (Table 2).

Prior general practitioner consultation was significantly less common in the elderly group (elderly 2.5% vs younger 9.5%, p<0.05). More than 80% of patients in the two groups arrived at hospital within twelve hours of major presenting symptom (Table 3).

### Table 1: Sex Ratio and Past Medical History of the Two Groups

<table>
<thead>
<tr>
<th></th>
<th>Elderly Group (≥75 years)</th>
<th>Younger Group (&lt;75 years)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex ratio (M : F)</td>
<td>0.9 : 1</td>
<td>2.2 : 1</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>24.7%</td>
<td>24.2%</td>
<td>NS</td>
</tr>
<tr>
<td>Diabetes</td>
<td>9.9%</td>
<td>19.0%</td>
<td>NS</td>
</tr>
<tr>
<td>Hypertension</td>
<td>28.4%</td>
<td>34.2%</td>
<td>NS</td>
</tr>
<tr>
<td>Stroke</td>
<td>4.9%</td>
<td>2.6%</td>
<td>NS</td>
</tr>
<tr>
<td>Hyperlipidaemia</td>
<td>0%</td>
<td>0.9%</td>
<td>NS</td>
</tr>
</tbody>
</table>

### Table 2: Major Presenting Symptom of Patients

<table>
<thead>
<tr>
<th></th>
<th>Elderly Group (≥75 years)</th>
<th>Younger Group (&lt;75 years)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain</td>
<td>79.0%</td>
<td>91.8%</td>
<td>&lt; 0.002</td>
</tr>
<tr>
<td>Dyspnoea</td>
<td>11.1%</td>
<td>3.0%</td>
<td>&lt; 0.005</td>
</tr>
<tr>
<td>Syncope</td>
<td>7.4%</td>
<td>0%</td>
<td>&lt; 0.005</td>
</tr>
<tr>
<td>Arrest</td>
<td>2.5%</td>
<td>0.9%</td>
<td>NS</td>
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### Table 3: Characteristics of Pre-Hospital Arrival

<table>
<thead>
<tr>
<th></th>
<th>Elderly Group (≥75 years)</th>
<th>Younger Group (&lt;75 years)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior general practitioner consultation</td>
<td>2.5%</td>
<td>9.5%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Time elapsed before arrival at hospital &gt; 12hrs</td>
<td>13.6%</td>
<td>17.7%</td>
<td>NS</td>
</tr>
</tbody>
</table>
Discussion

Acute myocardial infarction is one of the leading causes of death in Hong Kong. With a rapidly ageing population, the number of patients with AMI will continue to rise. AMI is associated with significantly higher mortality in elderly patients compared with their younger counterparts\textsuperscript{5,6}.

In the elderly group, there were significantly more females suffering from acute myocardial infarction in our study. Similar findings were also obtained by Liau\textsuperscript{3}. This can be related to the population characteristics that older women outnumber older men\textsuperscript{7}, as the mortality rate for women has declined more rapidly than that for men, and women live longer than men. The past medical history was similar in both groups. There was a trend of less history of diabetes mellitus in the elderly group but this did not reach statistical significance. This is somewhat different from other study which showed a greater proportion of elderly having diabetes mellitus and hypertension\textsuperscript{1}.

Diagnosing AMI in elderly people is often a challenge. Although the classical triad of chest pain, ECG changes, raised cardiac enzymes still hold true in elderly people, elderly AMI patients do have some different clinical presentation as compared to younger ones. As shown in our study, fewer elderly people presented with chest pain, but more presented with dyspnoea, or syncope when compared with younger patients. Bayer studied a series of 777 unselected elderly hospitalized patients with AMI\textsuperscript{8}. Chest pain was less frequently reported with increasing age. Syncope, stroke and acute confusion became more common and were often the sole presenting symptom. Similar findings were also shown in other international studies\textsuperscript{12,3,9}. The different symptomatology may reflect the greater likelihood that an older person has pre-existing heart failure or cerebrovascular disease\textsuperscript{10}, although we cannot demonstrate statistically significant difference in past history of stroke or IHD in both groups of patients. Apart from these atypical presentations, AMI can present rarely as apprehension and nervousness, sudden mania or psychosis, overwhelming weakness, and acute indigestion. Williams has stressed that the presentation of AMI in elderly people may be atypical or silent and the incidence of painless infarction increases with advancing age\textsuperscript{11}. He recommends that AMI should be suspected in any elderly person who has a sudden unexplained behavioural change, poor cerebral perfusion or unexplained abdominal pain or syncope.

As elderly people can present atypically, a high level of awareness is necessary so that the diagnosis of AMI will not be missed and prompt action will not be delayed. This is important as thrombolytic therapy is proven to be able to achieve a greater reduction in absolute mortality in the elderly group than in the young from the results of international thrombolytic trials\textsuperscript{5,12-16}. Lo has summarized the relative and absolute risk reduction for short term mortality in thrombolytic trial according to age\textsuperscript{4}, showing that for the same relative risk reduction, the absolute impact and benefit will be greater in elderly people due to their higher mortality if left untreated, contrary to previous beliefs that thrombolysis did more harm than good in elderly people.

Because of the atypical presentation, frequent repeat of ECG and 24-hour cardiac enzyme assay service, like creatine kinase-MB or troponin-T with immediate result may be considered for these groups of elderly patients in order to avoid delay in diagnosis. Furthermore, increased alertness and awareness by doctors or nurses\textsuperscript{2}, who are well informed about the normal and age-related changes in the cardiovascular system, can contribute positively to a more accurate and timely diagnosis and treatment of AMI in elderly patients.

Our study shows that most patients (over 80%) in both groups arrived at hospital within twelve hours of major presenting symptoms. This is somewhat different from that reported by DeBacker\textsuperscript{17} and Tresch\textsuperscript{5}, who showed that elderly patients may have suffered a longer pre-hospital delay. This can be partly due to the easy accessibility of the Accident and Emergency Department (AED) in the local situation, and partly due to the lower socio-economic status of our elders who prefer to go to AED which charges less. In fact, early arrival to AED is beneficial because early thrombolytic therapy at AED could shorten the transit time for treatment\textsuperscript{18}.

Prior general practitioner consultation was significantly less common in the elderly group, this could partly be related to the lower socio-economic status of our elderly population, but probably mainly related to the fact that their presenting symptoms warrant immediate hospital treatment. Furthermore, some elderly people are chair or bed bound and sending them directly to AED by ambulance is more convenient.

Conclusion

Elderly AMI patients do have difference in clinical presentations when compared to the younger ones. Health professionals taking care of these ge-
Geriatric patients should be well aware of these so that optimal care can be provided for them.

Acknowledgement
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References