

# The Presentation of Elderly People at an Emergency Department in Singapore

K H J Lim, K B Yap

## ABSTRACT

**Objective:** This study aims to provide demographic and clinical data of elderly people attending one of the hospital emergency departments in Singapore.

**Design:** Patients aged 60 years and above who attended the Emergency Department (ED) at Alexandra Hospital, Singapore, during 4 randomly selected one-week periods in 1996 were retrospectively studied.

**Main outcome measures:** Patient profile; presenting symptoms; diagnoses; types of investigations done, and outcome following attendance.

**Results:** A total of 455 ED attendance cards were analysed. The age of patients ranged from 60 to 102 years with a mean age of 72.8 years. Two hundred and sixty-one (57.4%) were males and 194 (42.6%) were females. Four hundred and twenty-seven (93.9%) were emergencies, 25 (5.5%) were non-emergencies and in 3 (0.6%) the priority rating was unknown. Two hundred and ninety (63.7%) were admitted, of whom 166 (57.2%) were males. One (0.2%) was admitted for social reason. The 3 most common symptoms were abnormalities of breathing (10.6%), falls (9.4%) and musculoskeletal pain (8.2%). Majority had 1 (40.4%) or 2 (41.6%) symptoms. The symptoms were mainly acute (1 day, 45.2%) or less than a week (25.7%). The 3 most common diagnoses were chest infection or pneumonia (8.2%), non-fracture head injury (7.2%) and heart failure (6.6%). Most patients (90.5%) had only 1 diagnosis. The 3 most common tests done were chest X-ray (172 patients, 37.8%), electrocardiography (119 patients, 26.2%) and blood glucose (86 patients, 19.0%). One hundred and twenty (26.4%) patients did not require any investigation.

**Conclusion:** The elderly constituted 12.4% of attendance at the ED but formed 34.5% of admissions. They were more likely to have emergency problems. Understanding the common presenting symptoms and diagnoses of the elderly will help doctors at the ED provide better care. Elderly patients with complex problems who are not hospitalised

would probably benefit from further geriatric assessment.

**Keywords:** geriatrics, demography, symptoms, diagnosis, admission

## INTRODUCTION

The ED is a major portal of entry of the elderly into the acute hospital and is often their first contact with the medical services<sup>(1)</sup>. As the elderly represents a substantial and increasing proportion of patients attending the ED<sup>(2)</sup>, it is important to know their demographic and clinical characteristics in order to optimise management of these elderly. To date, there are no local studies on the elderly attending the ED.

This study aims to determine the demographic and clinical characteristics of these elderly.

## METHOD

Four one-week periods in 1996 were chosen randomly using computer generated numbers. The ED cards of patients aged 60 years and above who attended the ED at Alexandra Hospital, Singapore, during the selected one-week periods in 1996 were traced and retrospectively studied. The data was entered into a Microsoft Access database and analysed using SPSS. The data captured included:

1. Patients' demographic characteristics (age, sex, race, time of arrival, whether arrival was by ambulance, whether a police report was made)
2. Source of referral
3. Presenting symptom(s) (only the 3 most significant symptoms were documented) and duration
4. Priority rating
5. Repeat patients
6. Main diagnosis made by the ED doctor
7. Investigations ordered
8. Where patients were admitted to
9. Social admission
10. Outcome of non-admitted patients

All symptoms and diagnosis were coded using the 3-letter categories of the ICD-10 (WHO)<sup>(3)</sup>.

Department of  
Geriatric Medicine  
378 Alexandra Road  
Singapore 159964

K H J Lim, FAMS, MRCP (UK),  
MMed (Int Med)  
Consultant

K B Yap, FAMS, FRCP (UK),  
DGM (Lond), MMed (Int Med)  
Consultant

Correspondence to:  
Dr K H J Lim

Department of  
Geriatric Medicine  
Changi General Hospital  
2 Simei Street 3  
Singapore 529889

Patients were categorised into 4 priority ratings: trauma emergency, trauma non-emergency, non-trauma emergency and non-trauma non-emergency.

A repeat case is defined as one seen again at the ED within 24 hours of the last consultation.

A case is considered a "social admission" when the ED doctor:

- specifically enters the words "social problem" or its equivalent in the ED card and
- cannot detect anything clinically significant to warrant admission but the relatives or care-givers of the patient insist on admission.

## RESULTS

A total of 455 ED cards were analysed. The age of patients ranged from 60 to 102 years with a mean age of 72.8 years (SD 9.0). Two hundred and sixty-one (57.4%) were males and 194 (42.6%) were females. Three hundred and three (66.6%) were Chinese, 67 (14.7%) were Malays, 66 (14.5%) were Indians and 19 (4.2%) were of other races.

Three hundred and sixty (79.1%) patients were self-referrals. Self-referrals were those who came on their own or were brought by their carers or families. Thirty-seven (8.1%) were referrals from government polyclinics, 37 (8.1%) from General Practitioners, 4 (0.9%) from other hospitals, 8 (1.8%) from the police and 9 (2.0%) were from unknown sources. The number of self-referral patients who came on their own could not be determined as this data was not available on the ED card. Between 12 midnight and 0800 hr, 65 (14.3%) patients were seen.

One hundred and forty-nine (32.7%) patients came by ambulance. Of the 149 who arrived by ambulance, 132 patients were admitted compared to 158 admissions out of the 306 patients who did not come by ambulance. Those who arrived by ambulance were more likely to be admitted ( $p < 0.001$ ). Three (0.7%) were repeat patients. Forty-seven (10.3%) patients required a police report because of trauma-related diagnoses. Not all trauma cases required a police report.

Ninety-nine (21.8%) patients were trauma emergencies, 2 (0.4%) patients were trauma non-emergencies, 328 (72.1%) patients were non-trauma emergencies, 23 (5.1%), patients were non-trauma non-emergencies and 3 (0.6%) were unknown. Of the 427 patients categorised as emergency cases (trauma and non-trauma types), 286 were admitted. Only 1 of the 25 patients categorised as non-emergency was admitted. This difference was highly statistically significant ( $p < 0.001$ ). Of the 99 trauma emergencies, 57 (57.6%) were males and 42 (42.4%) females; of the 328 non-trauma emergencies, 188 (57.3%) were males and 140 (42.7%) were females. Only 1 (0.2%) was admitted for social reasons.

There was a total of 808 symptoms. One hundred and eighty-four (40.4%) patients had 1 symptom, 189 (41.6%) had 2 symptoms and 82 (18.0%) had three or more symptoms. The 15 most common symptoms are shown in Table I. For patients who had multiple symptoms, we could not infer from the ED card which was the main symptom which brought

the patient to the ED (as this fact was often not recorded by the attending doctor). Duration of symptoms is shown in Table II.

There were 501 diagnoses. Four hundred and twelve (90.5%) patients had 1 diagnosis, 40 (8.8%) had 2 diagnoses and 3 (0.7%) had 3 diagnoses. During our encoding process, none of the patients was found to have more than 3 diagnoses on the ED card. The 16 most common diagnoses are shown in Table III.

The 7 most commonly ordered investigations in order of frequency were chest X-ray (172 patients, 37.8%), electrocardiography (119 patients, 26.2%), blood glucose (86 patients, 19.0%), X-ray of long bones (55 patients, 12.1%), skull X-ray (40 patients, 8.8%), abdominal X-ray (20 patients, 4.4%) and spinal or pelvic X-ray (16 patients, 3.5%). Full blood count, renal panel and urinalysis were ordered on 4 (0.9%) occasions each. There were 5 other tests which were infrequently ordered: urine dipstick, arterial blood gas, blood alcohol level, blood grouping and matching, prothrombin/partial thromboplastin time.

Of the 455 patients, 290 (63.7%) were admitted to hospital. Of those admitted, 166 (57.2%) were males and 124 (42.8%) females. One hundred and eleven (38.3%), 85 (29.3%), 63 (21.7%) and 31 (10.7%) were admitted to the Medical, Geriatric, General Surgery and Orthopaedics Departments respectively. The Emergency Department admits all patients aged 75 years and above with medical problems to the Department of Geriatric Medicine.

The 165 patients who were not admitted were mostly (100 patients, 60.6%) discharged without follow-up. Forty-one (24.8%) patients were referred to Specialist Clinics, 12 (7.3%) were discharged to government polyclinics and 11 (6.7%) to other places. One (0.6%) patient died at the ED.

## DISCUSSION

Although the elderly constituted only 12.4% (6,709 of 53,912) of the total attendance at the ED in Alexandra Hospital in 1996, they contributed to 34.5% (3,850 of 11,155) of the total admission<sup>(4)</sup>. This is consistent with the high admission rate among the elderly reported in the Western literature<sup>(5,6)</sup>.

The most common symptom at the ED is abnormalities of breathing, with majority of patients complaining of difficulty in breathing or shortness of breath. This is not surprising because it is a distressing symptom and a common symptom found in ailments such as respiratory infections, heart failure, ischaemic heart disease and obstructive airway disease.

Falls was the second most common symptom. Of the 76 who presented with falls, 35 (46.1%) falls occurred on the same level, from slipping, tripping or stumbling, 1 (1.3%) fall was due to pushing, 3 (3.9%) fell from their beds, 1 (1.3%) fell from stairs/steps, 1 (1.3%) fell from the ladder and 35 (46.1%) were unspecified. Falls occur more commonly in old age and the elderly are more prone to injure themselves if they fall<sup>(7)</sup>. Falls are often the only symptom of underlying silent and undiagnosed conditions. At the ED, falls should not be taken lightly without proper assessment. Besides looking out for fall-related

**Table I – Fifteen most common symptoms in elderly attending ED**

Symptom	No.	%
Abnormalities of breathing	86	10.6
Falls	76	9.4
Musculoskeletal pain	66	8.2
Cough	56	6.9
Dizziness and giddiness	45	5.6
Vomiting and nausea	45	5.6
Abdominal pain	44	5.4
Pain or discomfort in throat or chest	40	5.0
Fever	39	4.8
Struck or striking against objects	32	4.0
Symptoms concerning food and fluid intake (anorexia, loss of weight, etc)	29	3.6
Malaise, fatigue and weakness	26	3.2
Change in sensorium (syncope, drowsiness, coma, etc.)	25	3.1
Diarrhoea or increased bowel frequency	21	2.6
Constipation or reduced bowel frequency	17	2.1
Total	647	80.9

**Table II – Duration of symptoms**

Duration	Frequency	%
1 day or less	365	45.2
Few days	208	25.7
1 week	50	6.2
Few weeks	32	4.0
1 month	16	2.0
Few months	14	1.7
Unknown	123	15.2
Total	808	100.0

**Table III – Sixteen most common diagnoses in elderly attending ED**

Symptom	No.	%
Chest infection (28) and pneumonia (13)	41	8.2
Non-fracture head injury	36	7.2
Heart failure	33	6.6
Ischaemic heart disease - angina (11), infarction (6), chronic (14)	31	6.2
Obstructive airway disease - bronchitis (2), asthma (16), chronic airway limitation (12)	30	6.0
Laceration and other non-fracture injury	30	6.0
Fractures - head (1), hip & femur (10), spine & pelvis (5), others (14)	30	6.0
Gastroenteritis	17	3.4
Skin infection - cellulitis (10), abscess (5)	15	3.0
Giddiness and dizziness	15	3.0
Malignancy - digestive organ (4), respiratory (7), unknown primary (1)	12	2.4
Sepsis syndrome	11	2.2
Hemiplegia	11	2.2
Bleeding of upper gastrointestinal tract	11	2.2
Hypertension	9	1.8
Constipation	9	1.8
Total	241	68.1

injuries, the attending doctor should attempt to identify the underlying reason for the fall.

The 7 most common diagnoses were mainly related to cardio-respiratory disorders and trauma. The diagnoses of our local patients bear some resemblance to their Western counterparts. In one study, ischaemic heart disease, trauma, pneumonia, heart failure, and obstructive airway disease were found to contribute to 14.4%, 8.3%, 7.7%, 7.3% and 4.4% of 519 diagnoses respectively<sup>(8)</sup>. Ettinger et al reported that elderly patients have a higher proportion of cardiac and pulmonary disease, and injuries compared to the non-elderly<sup>(6)</sup>. It is difficult to compare our local diagnoses with Western studies in view of the different classification of diagnoses.

The majority of elderly had medical problems that were rated as emergencies. Those who arrived by ambulance were probably more ill and therefore more likely to be admitted. Chest X-ray, electrocardiography and measurement of blood glucose appeared to be the important and common investigations that helped the doctors in assessing the patient. It is quite obvious that the doctor is more likely to admit those he/she considers as emergencies compared to those cases which are not.

In 1996 at Alexandra Hospital, 57.3% (3,850 of 6,709) of the elderly aged 60 years and above compared to 15.5% (7,305 of 47,203) of the younger patients seen at the ED were admitted. Elderly patients seen at the ED were more likely to be admitted (odds ratio 3.7, 99%, CI 3.5 to 3.9). Although this study does not formally assess the appropriateness of the use of the ED by elderly people, the presenting diagnoses suggest that patients use the service because of medical needs. These needs were mainly due to respiratory and cardiac events (which play an important role in the admission patterns.)

Only 1 (0.2%) patient was admitted for social reasons. There is inconclusive evidence that elderly persons misuse the ED for social problems in this study.

## CONCLUSION

The elderly constitute a significant proportion of patients attending the ED and a disproportionately high number of those admitted to hospital. The elderly often have multiple, complex and often silent problems. Understanding the common presenting symptoms and diagnoses of the elderly will help doctors at the ED provide better care. Elderly patients with complex problems who are not hospitalised would probably benefit from further geriatric assessment.

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