Geriatric screening in acute care wards—a novel method of providing care to elderly patients

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Objective. To assess a nurse-implemented geriatric screening system.

Design. Descriptive study.

Setting. University teaching hospital, Hong Kong.

Patients. All (5080) elderly patients admitted between 1 January 1996 and 31 December 1996.

Main outcome measures. Patient characteristics such as disease, prior admission, living quarters, and regular medications; interventions taken; and morbidity and mortality.

Results. The most common interventions were referral to a convalescent hospital, patient education, and carer contact. The overall death rate was 8.5% and the diseases with the highest mortality rates were renal failure, liver cirrhosis, and cancer. Approximately one quarter of patients had been admitted to hospital in the previous month. The death rate was higher among women than men (10.8% versus 6.7%, P<0.001; odds ratio=1.68; 95% confidence interval, 1.38-2.05), as was the percentage of those with a history of admission in the previous month (32.8% versus 20.0%, P<0.001; odds ratio=1.95; 95% confidence interval, 1.71-2.21). Patients with multiple pathologies and polypharmacy had a greater frequency of previous 1-month admission compared with those who did not have these features (37.5% versus 20.0%, P<0.001; odds ratio=2.37; 95% confidence interval, 2.0-2.7). Patients living in old-age homes had a higher death rate and more previous 1-month admissions than home dwellers, and patients living in private old-age homes had a higher death rate but lower number of previous 1-month admissions than those living in subsidised old-age homes.

Conclusions. This study has collected important data from one form of integrated geriatric practice, which can be used for future service provision.

Introduction

The Prince of Wales Hospital (PWH) is the major acute hospital that serves the north-eastern New Territories of Hong Kong. The Geriatric Unit comprises an integrated geriatric practice in which general as well as geriatric physicians share the care of all acute admissions. The average number of admissions per day is approximately 50, of which about half are aged 70 years or older. As there is only one full-time geriatrician, an efficient system is needed to identify high-risk elderly patients who need rehabilitation and education, and to prevent their premature discharge home. The system should also improve the liaison between rehabilitation hospitals and the acute hospital. A unique geriatric screening system has been established in which the geriatric physicians and specialty geriatric nurse screen all elderly in-patients. In this article, we describe our experience of the geriatric screening system from 1 January 1996 to 31 December 1996.

Methods

Geriatric screening was done daily by the geriatric specialty nurse except for Sundays and public holidays. The geriatric specialty nurse at the PWH has more than 3 years' experience in the field of gerontology and has a Bachelor of Nursing degree as well as a graduate certificate in gerontology. At the PWH, the staff of each acute medical ward were on call every 4 days. The geriatric specialty nurse went to the pre-call acute medical wards (on the third day of each call cycle) and identified all patients aged 70 years and older. Demographic variables including age and sex

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were collected. The nurse also checked whether the patients had been admitted in the previous month. Social backgrounds of the screened subjects were carefully investigated. Residents of old-age homes (OAHs) were classified as attending a private OAH, subsidised hostel, or subsidised care and attention home. Those who came directly from home were asked if they were mostly alone at home. In addition, the presence of acute geriatric problems (acute confusion, recent onset of poor mobility, falls, and incontinence) and chronic geriatric problems (long-standing confusion, poor mobility, falls, and incontinence) was investigated. The presence of multiple pathology (more than three diseases) or polypharmacy (more than three drugs) was also recorded.

The geriatric physician and specialty trainees would then examine these patients with the geriatric nurse, the aim being to assist in solving the problems identified during screening. At the same time, they would decide if patients were in need of rehabilitation or supportive/terminal care in a non-acute hospital. In general, elderly patients with deterioration of activity of daily living and/or mobility as a result of an acute medical illness were good candidates for rehabilitation. Elderly people who, prior to admission, were mostly bed- or chair-bound and had dependent activity of daily living were considered not suitable for rehabilitation. In addition, interventions such as drug counselling, patient health education, arrangement of out-patient social services or domestic care, and advice on the issue of institutionalisation were given. Arrangements for geriatric day hospital and community geriatric team follow-up were made during screening for those in need. Patients who would benefit from further geriatric care were referred for geriatric team management. These patients were usually elderly people with problems that needed the expertise of a geriatric team. Occasionally, they were terminally ill elderly patients who needed palliative care but were too ill to be transferred to a convalescent hospital. The screening geriatric team also made arrangements for elderly patients in need to go to convalescent hospitals such as Shatin Hospital or Fanling Hospital. When a patient was discharged, the geriatric nurse would document the final action taken by the geriatric team. In addition, the outcome of each patient at the PWH was recorded as having been discharged home or to a nursing home, transferred to Shatin Hospital or Fanling Hospital (or another convalescent hospital), or having died.

The data collected between the 1 January 1996 and 31 December 1996 were analysed. The Chi squared test with Yates' correction was used to analyse 2x2 contingency tables. The cut-off level for statistical significance was taken as P=0.05.
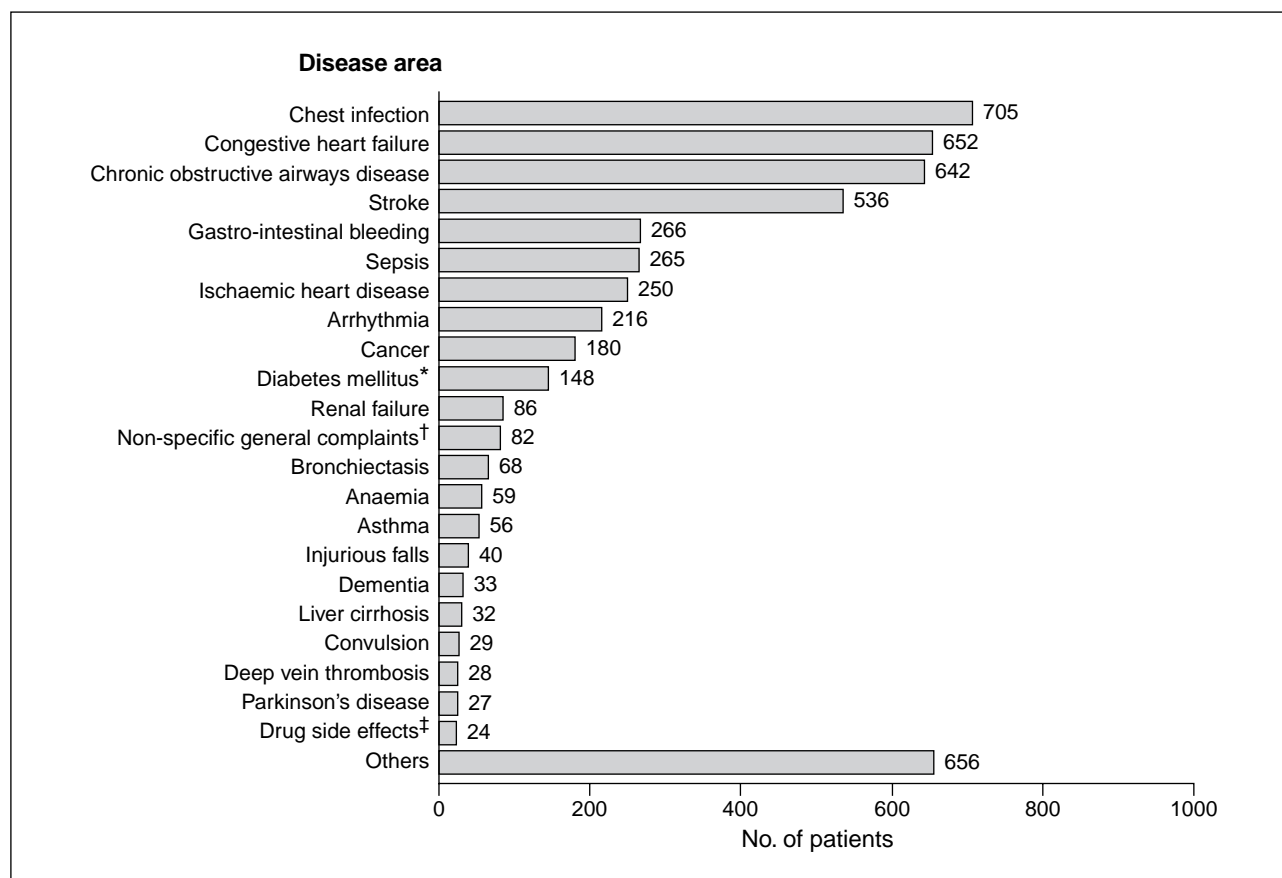
Results

A total of 5080 patients admitted to the PWH medical wards were screened in 1996. The main characteristics of the patients are shown in Table 1. The major diseases found in this elderly population are shown in the Figure. The overall death rate was 8.5%. The calculated death rate was highest in patients with renal failure (including acute, chronic, and end-stage renal failure; 32.5%). This was followed by liver cirrhosis (22.0%), cancer (20.0%), injurious falls (20.0%), non-specific complaints (elderly patients with degenerating general condition, dehydration, poor feeding or confusion; 14.6%), sepsis (including all types of sepsis other than chest infection; 10.6%), cerebrovascular accident (including both ischaemic stroke and intracerebral haemorrhage; 10.5%), chest infection (10.4%), arrhythmia (8.8%), convulsion (7.0%), congestive heart failure (5.6%), ischaemic heart disease (including angina and acute myocardial infarction; 4.0%), and chronic obstructive airways disease (4.0%). Gastro-intestinal bleeding (including upper and lower gastro-intestinal bleeding) and bronchiectasis also contributed 3.7% and 2.9% to the mortality, respectively.

The mortality rates for diabetes mellitus (including diabetic emergencies such as non-ketotic hyperosmolar coma and hypoglycaemia), asthma, dementia, convulsion, deep vein thrombosis, parkinsonism, and drug side effects (excluding drug-induced gastrointestinal bleeding or hypoglycaemia) were less than 1%.

Table 1. Characteristics of the study population

Characteristic	No.*
Sex (No. [%])	
Male	2194 (43)
Female	2886 (57)
Total	5080
Age (years) (mean [SD])	79.6 (6.5)
Male age	78.0 (5.6)
Female age	80.8 (7.0)
Living quarters (No. [%])	
Own home	3640 (72)
Home alone	424 (12)
Old-age home	1440 (28)
Private	764 (53)
Hostel	304 (21)
Care and attention home	369 (26)
Duration of stay (days)	
Mean (SD)	7.5 (6.3)
Median	5.0

* No. (%) or mean (SD), as appropriate

Disease area

Disease area	No. of patients
Chest infection	705
Congestive heart failure	652
Chronic obstructive airways disease	642
Stroke	536
Gastro-intestinal bleeding	266
Sepsis	265
Ischaemic heart disease	250
Arrhythmia	216
Cancer	180
Diabetes mellitus*	148
Renal failure	86
Non-specific general complaints†	82
Bronchiectasis	68
Anaemia	59
Asthma	56
Injurious falls	40
Dementia	33
Liver cirrhosis	32
Convulsion	29
Deep vein thrombosis	28
Parkinson's disease	27
Drug side effects‡	24
Others	656

* Including hyperosmolar crisis and hypoglycaemic attacks
† Such as degenerating general condition, poor feeding, dehydration, and confusion
‡ Other than drug-induced gastro-intestinal bleeding and hypoglycaemia

Fig. Major diseases found in the study population

The percentage of subjects considered to need rehabilitation during screening was 19%. Of these, 86% were sent to a convalescent hospital for rehabilitation. The remainder were either sent home or to an OAH. The main supporting convalescent hospital for the PWH is Shatin Hospital, which took more than 75% of the patients who were considered to need rehabilitation. Fanling Hospital was the second major hospital that accepted PWH patients for convalescence. Other non-acute hospitals within the Hospital Authority also occasionally accepted PWH elderly patients who needed rehabilitation.

A significant percentage of patients (25.6%) had been admitted to hospital in the previous month. The death rate of women was significantly higher than that of men (10.8% versus 6.7%, P<0.001; odds ratio [OR]=1.68; 95% confidence interval [CI], 1.38-2.05). Women with a history of admission in the past month were also more common than men with such a history (32.8% versus 20.0%, P<0.001; OR=1.95; 95% CI, 1.71-2.21). Those with multiple pathologies (more than three diseases) and presence of polypharmacy (more than three drugs) had a greater frequency of admission

1 month prior to current admission than those who did not have these features (37.5% versus 20.0%, P<0.001; OR=2.37; 95% CI, 2.0-2.7). When elderly subjects living in OAHs were compared with those from home, a significantly greater death rate was found in those from an OAH (11.0% versus 7.5%, P<0.001; OR=1.54; 95% CI, 1.25-1.89). In addition, a greater frequency of admission within the past month was observed in those living in an OAH compared with those who lived at home (38.5% versus 24.7%, P<0.001; OR=1.91; 95% CI, 1.67-2.18).

Among the elderly subjects from OAHs, 53% came from private OAHs while the rest came from subsidised hostels (21%) or care and attention homes (26%). Elderly patients from private OAHs had a higher death rate (15.6% versus 8.2%, P=0.002; OR=1.75; 95% CI, 1.24-2.47). However, patients from subsidised hostels or care and attention homes had a more frequent history of prior 1-month admission than those from private OAHs (40.0% versus 29.0%, P<0.001; OR=1.58; 95% CI, 1.26-1.96). Approximately 12% of elderly patients living at home were living alone. We did not find a statistically different death rate between

Table 2. Summary of geriatric interventions given during screening

Intervention*	Patients, n=5080 No. (%)
Referred to a convalescent hospital	914 (18.0)
Education given (eg dietary, use of inhaler, drug compliance, etc)	538 (10.6)
Direct contact made with old-age home and family (eg to obtain accurate background information, to identify problems, or for counselling)	254 (5.0)
Direct transfer to geriatric team	137 (2.7)
Suggestion given to general team doctors on the management of geriatric problems	117 (2.3)
Arrangement of post-discharge service made (eg home visit, home helpers, meals on wheels, financial and other social support, geriatric day hospital and community geriatric team follow-up, etc)	25 (0.5)

* Intervention was given to 1985 of the 5080 patients screened

those who were and were not alone at home. On the other hand, elderly people not alone at home had a more frequent history of previous 1-month admission than those at home alone (26.0% versus 18.0%; P<0.001; OR=1.6; 95% CI, 1.23-2.08).

There was a high prevalence of acute geriatric problems among elderly patients (present in 72% of all screened cases). Chronic geriatric problems were also common and could be found in 15% of elderly subjects. However, only a little more than 10% of the elderly patients were directly cared for by the geriatric team at the PWH. During screening, different interventions were given and these are summarised in Table 2.

Discussion

The PWH is the only hospital in Hong Kong to have an integrated geriatric subspecialty that uses a nurse-implemented screening system to assess elderly patients. Elderly individuals in pre-call medical wards were chosen for screening because they had been in hospital for 3 days and their acute medical problems had usually resolved. The geriatric team assessed these patients and provided advice and intervention to solve their remaining geriatric problems. Through daily screening, the geriatric team actively participated in the management of most of the elderly patients. Patients with special and difficult geriatric problems were identified and transferred to the geriatric team for further care. The screening system also provided an excellent database of the characteristics of elderly patients in the north-eastern New Territories.

Since the primary role of the PWH is to provide acute medical care, elderly patients who need convalescence and rehabilitation have to be transferred to other non-acute hospitals. In general, Shatin Hospital usually accepts patients who require continued medical care and/or intensive rehabilitation, while Fanling Hospital mainly accepts those who need supportive or terminal care. During 1996, most of the elderly patients who were considered to need convalescence and rehabilitation (86%) were sent to one of the non-acute hospitals for this purpose. The balance were not transferred for various reasons, such as patient or family refusal, improvement of the patient's condition, or a lack of suitable convalescence beds.

About one third of the elderly subjects came from OAHs. Half of these patients were from private OAHs and half from subsidised homes. The significantly higher death rate found in people from private OAHs compared with subsidised homes could be partly explained by the fact that most of the frail elderly patients were in private OAHs, because although subsidised OAHs in Hong Kong usually have a higher standard of care, they rarely accept frail elderly people. Inferior quality of care in some private homes could be another factor leading to the observed difference in death rates.

Re-admission is a common problem among geriatric patients in the acute hospital setting.[1,2] A previous survey showed that elderly medical patients discharged home (excluding those discharged to an OAH) from the PWH had 11% 1-month and 30% 6-month re-admission rates.[2] The proportion of patients with an admission in the previous month in this study was 25.6%. Strictly speaking, this observation was not the true re-admission rate since it was simply a retrospective look at previous admission rather than a cohort follow-up as in the above studies.[1,2] Nevertheless, the finding highlights the problem of multiple admissions for some elderly patients. Previous 1-month admission was more common in patients from subsidised OAHs than those from private homes. One possible explanation is the greater medical awareness of the better trained subsidised home staff who tended

to send their residents to hospitals for treatment sooner and more frequently. Elderly patients with relatives at home were also brought to hospital more promptly than those living alone, when a deterioration in their condition occurred. This difference probably accounted for the observed difference in previous 1-month admission between elderly subjects who were or were not alone at home.

The most common interventions made were referral to a convalescent hospital and patient education, which is not surprising since the median length of stay in the acute wards was only 4 days due to the heavy demand for beds, thus frequently leaving patients with incomplete investigations or non-definitive diagnoses. The post-acute hospitals thus play a significant role in providing further assessment, investigation, diagnosis formulation, medical treatment, convalescence, and rehabilitation. Their slower rates of patient turnover provide a good opportunity to solve a patient's psychosocial problems and to arrange placement or community services on discharge. Hence, the support from post-acute hospitals is important for the successful holistic management of older patients. Patient education is important as many elderly patients do not understand their drug regimen at discharge.[2-4] The education of elderly patients about dietary modifications and their drug regimen could theoretically reduce non-compliance in these areas.

The percentage of patients cared for by the geriatric team during screening was low. This was because the number of beds in the PWH available for the geriatric team was limited. Hence, most of the elderly patients who needed expert geriatric care were usually transferred to a convalescent hospital. Similarly, post-discharge services arrangements only contributed to a very small proportion of screening intervention work, as most of these tasks were done by the two post-acute hospitals.[5]

One potential limitation of the screening system was compliance with recommendations made by the geriatric team. However, the geriatric team at the PWH did not find this to be a major problem. As 86% of elderly patients who were considered to need rehabilitation were transferred to one of the convalescent hospitals for this purpose, the compliance with the geriatric team recommendations was not poor. One possible explanation was that the geriatric and general medical teams belonged to the same department, which allowed for easy communication between the geriatric physicians and other physicians. In addition, the geriatric team could closely monitor the progress of the screened patients. The geriatric team would also frequently see selected screened patients a few days later to see if their recommendations were being implemented correctly.

This report gives a description of the profile of elderly patients at the PWH, and the characteristics and need for a geriatric screening system in the acute hospital setting. The database compiled during the screening has helped to establish the needs of the elderly population and to plan future services. The value of the screening system is yet to be evaluated. Studies in the form of randomised controlled trials are needed to measure the benefit of the screening system.

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