Emergency Hospital Admissions from Care-Homes: Who, Why and What Happens? A Cross-Sectional Study

Terence Quinn

Division of Cardiovascular and Medical Sciences, Glasgow Royal Infirmary, University of Glasgow, Glasgow, UK

Abstract

Background: An increasing number of adults are resident in care-homes. Poor prognosis is often assumed; however, outcomes in this group are not well described. We hypothesised that the clinical characteristics of emergency admissions from care-homes are no different from those of age-matched, community-dwelling elders. Objectives: To determine the clinical characteristics of unscheduled hospital admissions from care-homes in terms of severity of illness, admission diagnosis and outcome. To put these data into context, we compare them with data from age-matched, non-care-home resident, emergency admissions. Methods: The definition of care-home was a residential facility providing full-time care. We prospectively studied consecutive, unscheduled hospital admissions from care-homes to all receiving wards (medical, surgical and orthopaedic) in a central, urban, teaching hospital. Controls matched by age (±1 year), gender, ward and admission date were independently collated. Basic descriptive statistics were employed for the analysis of clinical and demographic variables. Data were non-parametric and comparative analyses were based on χ² or Mann-Whitney tests as appropriate. Results: Over a 3-month period, there were 114 care-home admissions representing 80 patients (82 medical ward, 17 orthopaedic and 15 surgical). Demographics, co-morbidities and medication number were equivalent for cases and controls, as was the severity of the presenting illness (Modified Early Warning System scoring, serum albumin and C-reactive protein). Presenting diagnoses were heterogeneous with the majority of care-home admissions being secondary to sepsis (24; 29%) and falls (16; 19%). Care-home admissions and controls had similar inpatient mortality (14 vs. 15%; p = 0.84) and duration of stay (5 vs. 5 days; p = 0.73). There were a greater number of readmissions of patients from care-homes compared to the controls (26 vs. 3%; p < 0.0001). Conclusion: Care-home residents admitted for unscheduled hospital care have similar outcomes to age-matched, community dwelling admissions; however, their risk of readmission is substantially higher.

Key Words
Care-home · Emergency care · Nursing home
Introduction

Comprehensive geriatric assessment, rehabilitation and support strategies can help maintain an older population in their own homes. For a proportion of adults, independent living is no longer feasible and permanent residence in a facility providing on-site 24-hour care is necessary. The generic term care-home is used and encompasses labels such as ‘nursing home’, ‘residential home’ and ‘residential care facility’. Contemporary figures report a total of 979 care-homes in Scotland, offering around 100 places per 1,000 population aged over 75 years [1]. If current patterns of care provision are maintained, absolute numbers of care-home residents will increase in line with the ageing population.

Provision of care for this cohort has previously been fragmented and inconsistent [2], although successful interventions to improve the management of specific disease states and poly-pharmacy have been described [3, 4]. Residents are vulnerable to unexpected deteriorations in health, and admission to hospital is often the default position. Opinions on the optimal acute treatment of care-home residents are polarised and in the absence of published evidence decisions on care have necessarily been based on anecdote and stereotype [5]. As an example, in the lay and medical press of North America, emotive phrases such as ‘dumped in the emergency room’ have been used to describe this cohort, with an expectation of poor outcome regardless of treatment [6]. Debate as to the appropriate use of emergency services by care-homes is also apparent in the UK [7, 8].

To better coordinate care, novel models of service delivery are being piloted, including ‘admission avoidance’ schemes [9]. While supported by specialist societies [10], the evidence base for these interventions in a care-home setting is weak. To inform, debate and assist in future service planning requires access to basic demographic and clinical details of the care-home population. Published accounts of these data are limited.

We hypothesised that emergency hospital admissions from care-homes are no different to age-matched, non-care-home residents in terms of severity of illness, admission diagnosis and outcome.

Methods

This was a cross-sectional, prospective study of consecutive, unscheduled hospital admissions from care-homes to a central hospital. Fully anonymised observational data were gathered with no direct patient contact.

Population

Our central teaching hospital serves an urban population of around 220,000 and is well placed for exploratory studies of care-home admissions, with approximately 10,500 medical admissions annually (4,000 aged over 75 years) and 124 care-homes (approx. 1,500 residents).

We studied all unscheduled admissions from care-homes to general medicine and general and orthopaedic surgery. The definition of care-home was a residential facility providing full-time care. We did not differentiate private, local authority or voluntary sector and all levels of care (nursing home and residential home) were included. We did not include sheltered housing services, community-supported living or specialist residential facilities.

For each care-home admission, a corresponding control was prospectively selected. ‘Controls’ represented community-dwelling, unscheduled admissions to our hospital matched to care-home admissions by day of admission, ward of admission, age (±1 year) and sex. An independent blinded researcher selected the controls. Case mix in our acute wards made it impossible to match all care-home admissions using our strict matching criteria and allocation was in the approximate ratio of 1 control for 2 cases.

Data Retrieval

We ran a 3-week prospective-feasibility pilot during which admitting wards were checked daily for cases. The pilot suggested a daily rate of 1–2 care-home admissions. An arbitrary target of 100 admissions was chosen, suggesting data collection over a 3-month period.

With assistance from local audit services, a computer program was devised to scan daily admission lists and identify cases. The validity of the tool was confirmed through a process of direct contact with admission wards during the first week.

We used the Modified Early Warning System (MEWS) [11] score to quantify severity of presenting illness. This ordinal, hierarchical scale ranges from 0 to 14 and uses physiological parameters (pulse, blood pressure, respiratory rate and consciousness level) to describe patients at risk of deterioration. It is suitable for bedside application and has been validated in elderly populations [12]. Blood markers of C-reactive protein and serum albumin were chosen as surrogates of acute and chronic illness. Medical co-morbidities and medication at time of admission were transcribed from GP patient summaries.

We measured functionality across 3 domains: cognitive impairment (defined from the GP summary or cognitive testing performed during admission), mobility (label of ‘falls’ or ‘poor mobility’ or a documented need for assistance with mobility) and incontinence (bowel and bladder, including catheter).

All medical interventions in the first 48 h of admission were documented. Using a predefined list of treatments potentially available in a supported care-home, each admission was assessed using the dichotomous descriptors ‘absolute need for admission’ or ‘all treatments potentially available in a care-home setting’. Locally available facilities that may prevent hospital admission were: care of the dying, continence/catheter care, assistance with subcutaneous fluids, physiotherapy, pharmacist review of medications, prescription of oral medication, domiciliary geriatric assessment and outpatient follow-up.

116

Gerontology 2011;57:115–120

Quinn
Basic descriptive statistics were employed for clinical and demographic variables. The spread of data suggested a non-parametric approach and $t$-tests or Mann-Whitney tests were used as appropriate. Given the unexpectedly high numbers of care-home readmissions, we performed post hoc binary logistic regression with readmission as the dependent variable. All analyses were performed using Minitab 15.0 (Minitab Inc., USA).

Funding
This was a departmental study with no external funding.

Results

Data were collated for the period of September 1 to December 1, 2007 inclusive. In total, 83 care-home patients were analysed (114 admissions: 82 medical ward, 17 orthopaedic and 15 surgical). Controls were 60 patients (62 admissions: 41 medical, 12 orthopaedic and 9 surgical).

Demographics, number of co-morbidities and number of medications prescribed at time of admission were equivalent for cases and controls. Pre-admission functional dependence was more prevalent in care-home residents across all 3 chosen domains (table 1).

Presenting diagnoses were heterogeneous with the majority of care-home admissions being secondary to sepsis and falls. There was a suggestion that dehydration/poor oral intake may be more prevalent in the care-home cohort. Severity of presenting illness as described by MEWS scoring and blood markers was equivalent (fig. 1).

Outcomes were described by inpatient mortality, length of stay and readmission. Only readmission differed between groups, with a higher incidence occurring in care-home cases (table 1). Five care-home residents were admitted 3 or more times in 3 months. Binary logistic regression suggested no significant association between readmission and clinical, demographic or laboratory parameters; however, the small numbers and associated wide confidence intervals precluded meaningful interpretation.

Based on interventions administered within the first 48 h, the proportion of care-home admissions that could...
Discussion

Using prospective case findings, we attempted to describe patterns and outcomes for unscheduled admissions from care-homes. We found a care-home unscheduled admission rate of one patient daily. This represents around 3% of the total daily ‘take’ and is not in keeping with the perception that care-homes represent a substantial service burden.

Care-home residents have traditionally been regarded as a cohort with a poor prognosis. Certainly care-home residents were unwell on admission, with background functional impairment. However, the majority survived to discharge and their short-term outcomes were no different from those of the matched controls.

Our desire to better characterise the demographics and outcomes of a care-home cohort was in part driven by the scarcity of published literature in the field. However, some UK and international data are available [13]. American-based studies have suggested increased mortality and length of stay for care-home admissions but the comparators used were not comprehensively ‘matched’, and presenting illnesses were similar to our own data [14, 15]. A prospective study of all care-homes within an English health authority reported increased mortality but equivalent length of stay for care-home admissions [16]. In this study, all community admissions aged over 65 years were used as the comparator, rather than case-matching. Again, presenting diagnoses were similar to our cohort with an excess of sepsis and injury.

Much of the available literature has focussed on perceptions of the ‘appropriateness’ of care-home admissions with proportions of appropriate admissions ranging from 7 to 36% [7, 8, 17]. Whether these patients could have been safely managed in the community and the resources required to facilitate this were available is a matter of debate. In our analysis, an equivalent number of controls could have been managed in the community, suggesting that ‘admission avoidance’ interventions may be appropriate for many elderly hospital attendees, regardless of domicile. We recognise the difficulty of diagnosis in a community setting and that the benefits of admission extend beyond the ‘medical’ treatments offered.

The high readmission rate is of clinical and economic concern. We did not find robust predictors of readmis-

<table>
<thead>
<tr>
<th></th>
<th>Care-home (n = 83)</th>
<th>Controls (n = 60)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin, g/l</td>
<td>32 (30–37)</td>
<td>34 (28–38)</td>
<td>0.67</td>
</tr>
<tr>
<td>CRP, mg/l</td>
<td>33 (5–143)</td>
<td>22 (5–134)</td>
<td>0.80</td>
</tr>
<tr>
<td>MEWS</td>
<td>1 (1–3)</td>
<td>1 (0–3)</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Fig. 1. a–c Severity of presenting illness in care-home patients and controls. Median ± IQR. Asterisks represent statistical outliers. d Data for albumin were not available for 15 (18%) care-home admissions and 4 (7%) controls, and data for CRP were not available for 8 (10%) care-home admissions. CRP = C-reactive protein.
Duration of admission was relatively short and none of the patients had multidisciplinary assessment coordinated by specialists in geriatric medicine. Care-home cohorts are characterised by non-specific presentations and multiple active problems and a possible interpretation of these readmission data are that emergency admissions from care-homes do not receive comprehensive assessment of all care needs. With this in mind, an argument could be made for a targeted assessment of all care-home residents admitted to hospital acutely or a community-based assessment of those recently discharged from acute wards. However, an equally valid counter argument is that readmissions are unavoidable in this frail group. Only 2 patients were readmitted with the same problem that precipitated index admission and few patients presented with decompensation of a known chronic disease.

Strengths of our study include the prospective nature of the analyses and a robust case-finding mechanism. We concentrated on admissions and may have underestimat-ed the total number of hospital/care-home interactions as the numbers of care-home residents discharged directly from ‘accident and emergency’ were not collected. We lack robust data describing non-admitted care-home residents and can offer no discussion of how well hospital admissions represent the total care-home population in our area. We did not collect mortality data beyond hospital stay and can make no comment on the period immediately after discharge.

We acknowledge the preliminary, hypothesis-generating nature of our findings. There were certain methodo-hological limitations inherent in our study. Data collection and analyses were not blinded, with an attendant risk of bias. However, we did use independent researchers to collect data on cases and controls. We had little background data to inform statistical power calculations. The numbers included are large enough to detect major differences between care-home and non-care-home dwellers; however, for sub-analyses, the small numbers included will increase the risk of type II error. For most of the analyses performed, the differences between groups are negligible or substantial.

Our comparative analyses were primarily designed to contextualise the presented outcomes data for a care-home cohort and again we would caution against drawing definitive conclusions from this potentially highly selected population. We accept that there may be systematic differences between the health care provided to community-dwelling elders and care-home residents, for example it is possible that only those care-home residents considered sufficiently ‘healthy’ to survive acute admission are referred to the hospital. Our results provide a snapshot of activity in a single urban teaching hospital and may not be generalisable to all health care settings. In particular, many Glasgow care-homes are served by a specialist group of GPs with ready access to a multidisci-plinary team. Local care-homes do not use specific protocols for case management of common medical conditions [18]. However, the demographic and clinical details of care-home admissions are in keeping with other studies from the UK and other countries [19].

In conclusion, people from care-homes admitted for unscheduled hospital care have similar short-term outcomes compared to non-care-home patients; however, the risk of early readmission is substantially higher. Many care-home and non-care-home emergency hospital admissions receive treatments that could potentially be delivered in the community.

References


