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Research paper

Increasing primary health-care services are associated with acute short-term hospitalization of Danes aged 70 years and older

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ABSTRACT

Background: Ageing is accompanied by increased risk of morbidity and subsequent risk of acute hospitalisation. With ageing populations, health-care providers focus on prevention of acute admissions of older adults by timely identification and treatment in the community. However, identifying an emerging acute disease can be difficult in older adults due to atypical and vague symptoms, but may be expressed by increased contact to health-care providers.
Method: During a 12-month period, all 70+-year-old people short-term (< 48 hours) hospitalised in the acute medical unit of Svendborg Hospital, were identified. For each admission, individual data on municipal home care and primary care physician (PCP) contacts were retrieved from 12 months before to 6 months after the admission. Those identified as receiving home care for the whole period constituted a subsample.
Results: Totally, 443 short-term hospitalisations were recorded in 391 patients (mean age 80.6 years [SD 6.8]; females 57%). The subsample included 157 admissions (141 patients, mean age 84.0 years [SD 7.2]; females 74%). Home care service (minutes per month) increased gradually and significantly over the 12 months prior to admission (33%). Also the number of contacts to primary care physician increased significantly, but only in the last 3 months prior to admission.
Conclusion: Prior to an acute short-term admission, home care receiving older adults have significant increases in home care service and PCP contacts and services. Monitoring health-care use may timely identify older adults at risk of acute hospitalisation.

1. Introduction

Ageing is accompanied by an increased risk of morbidity and functional decline [1–3] and may increase further in the coming years, as recent cohort studies have shown higher proportions of common chronic conditions in the post-WW2 generations compared to earlier birth cohorts [4–6]. Furthermore, increased morbidity is followed by raised demands to primary and secondary health-care systems, and is clearly shown by the increasing number of hospitalisations with advancing age [6]. Following the ongoing demographic development towards ageing populations [7], health-care providers are already challenged today, but are expected to be further challenged as the large post-WW2 generations enter their fourth age.

Denmark is a small country with 5,7 million inhabitants (2016), of which more than 700,000 are aged 70 years or older, a number that rose by 115,000 from year 2011 to 2016 [8]. Health care, including home care, is provided by the tax-funded public health-care system, and various initiatives within the system have been launched in recent years to improve efficiency and to balance health-care costs and financial resources. Especially acute hospital admission of older people is targeted through preventive measures in the municipal home care service, and incentivised by a municipal co-payment fee to be paid to the regional hospital owners for each hospitalized citizen. In addition, municipalities are being monitored for the number of their citizens hospitalised with a preventable admission diagnosis. These preventable diagnoses are defined by the National Board of Health and cover a range of common medical action discharge diagnoses frequently used in older acutely hospitalised patients, e.g. dehydration, urinary infection, lower respiratory tract infection, gastroenteritis, falls etc. It is believed that these diseases and conditions could have

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been prevented by timely identification and treatment. Such surveillance is believed to increase the municipalities focus on prevention [9]. It is a general belief that introducing these initiatives will reduce the number of acute admissions.

Although health-care providers focus on prevention in the primary care sector to avoid hospitalisation, little is known about the pattern and the use of primary care services prior to acute hospital admission. We hypothesised that increased usage of primary care services (home care and primary care physician) over a period of time may serveas a proxy for deteriorating health and increased risk of acute admission.

2. Material and methods

2.1. Study design and participants

In a retrospective cross-sectional study we identified all non-institutionalized citizens of Svendborg Municipality aged 70 years or older, who were acutely hospitalized in the Acute Medical Unit (AMU) at Svendborg Hospital and discharged within 48 hours to their dwelling (short-term admission). The inclusion period was from September 1st, 2012 to August 31st, 2013.

2.2. Method

Each citizen was identified by the individual unique civil registration code (CRC), which was used as key for the extraction of relevant hospital administrative data from the hospital's patient administrative system (FPAS©). By means of the CRC, all identified patients were linked at the individual level with municipal home care data, including nursing care (KMD CARE©) regarding allotted time for in-home care (see below). The CRC was also used to link with individual data from the Danish National Health Insurance Service Registry, which records all types of contacts to the primary care physician (PCP). Both the municipal and National Health Insurance data were extracted for a period from twelve month prior to six months after the acute short-term admission of the individual.

2.3. Use of home care service

Home care is provided by the municipality after a needs assessment, and the allotted time may be regulated following changes in need of care. The municipal health-care database includes individual information on both the allotted time (in minutes per day) and the type of delivered services, i.e. the need for personal care, nursing care, and in-home rehabilitation. Data were extracted for a period of 12 months prior to 6 months after each single admission. For analytical purposes, the allotted time for each of the three services were summed to a total allotted time for use of home care service, and expressed as minutes per month. A subsample constituted of all those admissions where home care service was provided to the individual for at least 12 months before the acute short-term admission.

2.4. Contacts to primary care physician

Data on each individual's contacts with their PCP (or the on-call PCP) were retrieved as type and number of contacts or services, i.e. office consultation, blood sampling and analyses, electronic or telephone communication with the citizen or the home care nurse, and house calls. A sum score was created expressing the total number of contacts and services provided by the PCP at the individual level, and presented as the average number of contacts and services per individual per month for the last 12 months prior to and 6 months after the acute admission.

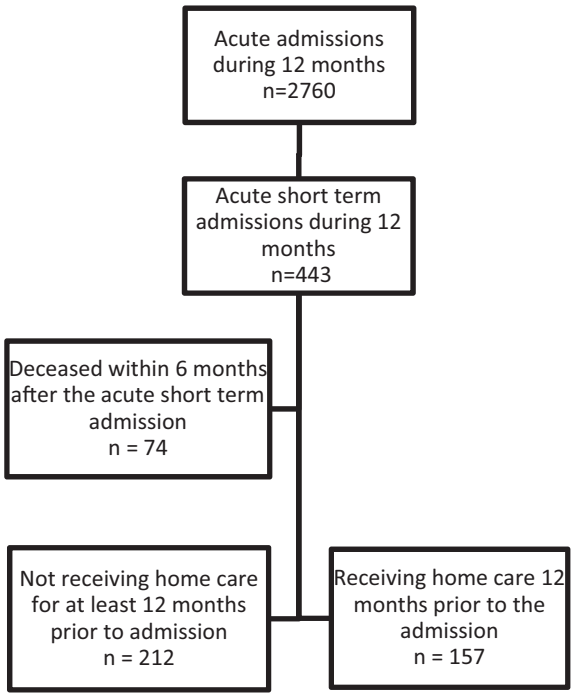

Fig. 1. Flowchart – acute admissions among citizens of Svendborg Municipality aged 70 years and older.

2.5. Statistical analysis

The data represents average use of municipal home care services in minutes per month per patient, and contacts to and/or services provided by the PCP. Data on individuals dying less than 6 months after discharge from the short-term admission were not included in the analyses, as they may include terminally ill individuals. Among the 6 months post-discharge survivors, a subsample was selected representing those who received home care for at least 12 months prior to the acute admission (Fig. 1). The descriptive data are presented as numbers, percentages, and means including standard deviation (SD). Each admission counted as one, and home care use was calculated for 12 months prior and 6 months after each admission, even though it meant that some individuals were included more than once. Wilcoxon signed rank test was used to analyse and describe use of home care and primary physician contacts. IBM SPSS software v 24.0 (IBM Corp, Armonk, NY) was used for statistical analysis. The statistical significance threshold for all tests was set to $P < .05$.

The study was approved by the Danish Medical Authority (jnr. 3-3013-417/1/) and the Danish Data Protection Agency (jnr. 2008-58-0035).

3. Results

During the inclusion period 2760 acute admissions to the AMU of Svendborg Hospital were patients aged 70 years or older and residents in Svendborg Municipality. Of these, 443 were short-term admissions (391 individuals) and the subsample constituted 157 short-term admissions (Fig. 1). Subsample mean age was 80.6 (SD 6.8), 57% were females, and 54% received home care at the time of admission. The mean length of in-hospital stay was 21 hours and 26 minutes (SD 14:53).

Within the first month after discharge another 111 (25%) were re-admitted in yet another short-term readmission. Within six months 74 (17%) patients had died (Fig. 1). In all, 317 patients with totally 369 admissions were alive 6 months after admission. Of

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