Impact on hospital admissions of an integrated primary care model for very frail elderly patients

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ABSTRACT

Very frail elderly patients living in the community, present complex needs and have a higher rate of hospital admissions with emergency department (ED) visits. Here, we evaluated the impact on hospital admissions of the COPA model (CO-ordination Personnes Agées), which provides integrated primary care with intensive case management for community-dwelling, very frail elderly patients. We used a quasi-experimental study in an urban district of Paris with four hundred twenty-eight very frail patients (105 in the intervention group and 323 in the control group) with one-year follow-up. The primary outcome measures were the presence of any unplanned hospitalization (via the ED), any planned hospitalizations (direct admission, no ED visit) and any hospitalization overall. Secondary outcome measures included health parameters assessed with the RAI-HC (Resident Assessment Instrument-Home Care). Comparing the intervention group with the control group, the risk of having at least one unplanned hospital admission decreased at one year and the planned hospital admissions rate increased, without a significant change in total hospital admissions. Among patients in the intervention group, there was less risk of depression and dyspnea. The COPA model improves the quality of care provided to very frail elderly patients by reducing unplanned hospitalizations and improving some health parameters.

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1. Introduction

Very frail elderly patients present a complex mix of medical, psychological and social needs along with disabilities (Campbell, Seymour, & Primrose, 2004; Lechowski et al., 2005) and a high risk of death (Landi et al., 2010). Health systems are fragmented and geared toward treating acute illnesses rather than managing chronic health conditions (Coleman & Berenson, 2004; Friedman and Kalant, 1998). As a result, the complex needs of elderly patients living in the community are not adequately met due to a discrepancy between their needs and the services provided (Asch, Sloss, Hogan, Brook, & Kravitz, 2000; Kennedy, 2001). This older population living with unmet needs therefore has a higher rate of hospital admissions (Sands et al., 2006). Among such hospitalizations, there are more unplanned admissions via ED visits (Hunt, Walsh, Voegeli, & Roberts, 2013; Walsh, Roberts, Nicholls, & Lattimer, 2008), which may lead to poor quality of care (Samaras, Chevalley, & Samaras, 2010) and the overcrowding of EDs (Ackroyd-Stolarz, Read Guernsey, Mackinnon, & Kovacs, 2011).

Integrated primary care models with intensive case management for frail elderly patients have yielded promising results including better accessibility and use of community services (Beland et al., 2006; Low, Yap, & Brodaty, 2011). The impact on hospital admissions is still mixed, sometimes with no effect found on population care trajectories (Gravelle et al., 2007). Reinforcing a health system's capacity to provide planned hospitalizations, which are not associated with an ED visit, would improve the quality of care for patients and prevent overcrowding in ED (Coleman, 2007). In

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addition, planned hospitalizations are recommended in some cases, in particular for patients with cognitive disorders (AGS, 2003). But planned hospitalizations have rarely been studied as one of the potential impacts of integrated care models.

Therefore, we developed and implemented the COPA model (COPA is a French acronym for *coordination of care for the elderly*) in order to improve care trajectories between primary and hospital care for very frail older patients, and this model has been implemented since 2006 in an urban district of Paris. It focuses on optimizing patient care trajectories and in particular, to decrease unplanned hospitalizations in order to avoid use of the ED as patients' main entry point for hospital care. A quasi-experimental study was conducted to assess the impact of this model on hospital admissions and health parameters among community-dwelling very frail elderly patients. We hypothesized that the implementation of this integrated care model would reduce unplanned hospital admissions.

2. Materials and methods

2.1. Intervention

As previously described (Vedel, de Stampa, Bergman, Ankri, Cassou, Mauriat, et al., 2009; Vedel, de Stampa, Bergman, Ankri, Cassou, Blanchard, et al., 2009), the COPA model was built over a 2-year period through a "bottom-up" approach that featured collective action through the participation of health care and social service professionals (Vedel, de Stampa, Bergman, Ankri, Cassou, Mauriat, et al., 2009). The model was then implemented in an urban district of Paris (the 16th borough of Paris, with 150,000 inhabitants). The French system is publicly funded and is considered fragmented between health and social services, community-based and hospital-based services and long-term care and acute care (Somme & de Stampa, 2011).

Under this model, a two-person team – consisting of a nominated case manager and the patient's primary care physician – were responsible for the patient's care trajectory. A single entry point was used to refer community-dwelling, very frail patients with complex needs to case managers. Only nurses were recruited to be a case manager and each case manager had a case load of 40 very frail patients with complex needs. The case manager performed a home-based comprehensive geriatric assessment using the RAI-HC (Morris et al., 1997), developed an individualized care plan using evidence-based interdisciplinary protocols (Carpenter, 2006), coordinated all the required services during the follow-up. The ongoing role of the primary care physician was to collaborate with the case manager in the case management process and to share information on their very frail patients included in the program. Case management was provided until the patient is moved to a nursing home or until death. The two-person team received support as needed from geriatricians participating in COPA. The COPA geriatricians spent half their time working in the community and the other half working in hospitals in the same borough. They provided in-home specialized needs assessments and implemented interdisciplinary evidence-based protocols. In addition, the geriatricians also organized planned hospital admissions (direct admission to hospital, without an ED visit).

Overall, initial care plans were discussed between the primary care physician and case manager for 1/4 of COPA patients. Half of COPA patients were evaluated at home by the geriatrician, 1/3 received at home intervention by a psychologist and 1/3 of hospitalized patients were seen by the case manager prior to discharge. On average, there were approximately 3 follow-up visits by the case managers during the 12-month period (Vedel, de Stampa, Bergman, Ankri, Cassou, Mauriat, et al., 2009; Vedel, de Stampa, Bergman, Ankri, Cassou, Blanchard, et al., 2009).

The model's governance is provided by a non-profit consortium that includes managers from the community-based services and hospital settings (public funding from France's Medicare program).

2.2. Study design

The study was designed as a pre-test post-test quasi-experimental study with control group (Shadish & Campbell, 2002). The study was conducted over a one-year period in 2008 using an intervention site and a control site. The 16th borough of Paris, where COPA was implemented, was compared to two other nearby urban sites as a control group. The control group was recruited in the urban districts of Paris, namely, the 17th borough and in Boulogne–Billancourt. These regions were comparable to the intervention area in terms of size, demographic profile of the population, socio-economic status and services offered.

The control group was given the usual care, including medical primary care, in-home visits from their primary care physician, nursing, rehabilitation, and social and personal services. There was no integration, and there were no case managers to coordinate all services or community-based geriatricians in the control region. The study was approved by the Ambroise Paré Hospital research review board. Informed written consent was obtained from each patient or the family caregiver.

2.3. Participants

Patients were recruited either from hospitals in the area or from community-based care health services centers. For both the intervention and control groups, the eligibility criteria were: being a senior over 64 years old, living in the community, having a primary care physician, and being very frail with complex health and social needs. The Contact Assessment (CA) tool – derived from the interRAI set of tools (Resident Assessment Instrument) – is used to assess complex needs (Hirdes, 2006). This CA tool consists of nine separate items with yes/no binary responses (yes = 1; no = 0): four items for difficulties performing activities of daily living (dressing, personal hygiene, bathing and moving around indoors), one item on cognitive deficiency, one item on perceived poor health, one item on shortness of breath, and two social items (lack of a natural caregiver, living alone). Persons with a score of 6 or more were defined as having complex needs with a mix of medical, psychological, social conditions and functional impairments. Patients with a planned institutionalization within the next three months and patients with a probable life expectancy of less than one month were excluded.

A sample size of 100 participants in the intervention group and 300 in the control group (3 controls for each case) was determined in order to detect a 20% increase in the risk of hospitalization with 80% power at a 5% level of significance. Patients were recruited consecutively until the desired sample sizes were achieved.

2.4. Measures

The primary outcome measures were the presence of any unplanned hospitalization (via the ED), any planned hospitalizations (direct admission, no ED visit) and any hospitalization overall (planned or unplanned) during the follow-up period. Unplanned hospital admissions included acute clinical presentations such as falls with serious injury, abdominal surgical pain, acute respiratory failure and acute heart failure. Planned hospital admissions included malnutrition, neuropsychiatric disorders, falls without serious injury, congestive heart failure and infection. ED visits alone were excluded. The data were recorded in a central database maintained by the case managers. Prior hospitalization was assessed with the RAI-HC (Morris et al., 1997).