Hospital at Home admission avoidance with comprehensive geriatric assessment to maintain living at home for people aged 65 years and over: a RCT

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†In memoriam

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Scientific summary

Admission avoidance hospital at home with CGA

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Scientific summary

Background

Providing acute hospital-level care to greater numbers of older adults with complex health needs, and in the context of a fixed or shrinking hospital resource, is a problem faced by health systems in many countries. Combined with concern that the acute hospital is not always the best place of care for this population, a number of countries are redesigning services and testing new ways to provide health care to this population. There is an urgent need to evaluate service redesign that seeks to provide an alternative to hospital-based care. Prior to this randomised trial, evidence for geriatrician-led admission avoidance hospital at home was limited to a few small randomised trials, and the effect on outcomes and cost was uncertain.

Objective

We assessed the clinical effectiveness and cost-effectiveness of geriatrician-led admission avoidance hospital at home with comprehensive geriatric assessment, compared with admission to hospital, on living at home (the inverse of mortality and long-term residential care) at 6-month follow-up. We interviewed patients and carers who received hospital at home or hospital-based care for their acute change in health to understand their experiences, and studied the contexts and practices of implementing geriatrician-led admission avoidance hospital at home with comprehensive geriatric assessment and how it differed from inpatient care.

Methods

We conducted a multisite, randomised, open trial of geriatrician-led admission avoidance hospital at home with comprehensive geriatric assessment in nine hospitals across the UK, and a parallel economic evaluation and process evaluation. Geriatrician-led admission avoidance hospital at home with comprehensive geriatric assessment comprised co-ordinated multidisciplinary care provided by doctors, nurses, physiotherapists and occupational therapists and, if required, referral to other services (e.g. older people's mental health services, diagnostic services, social workers, dietitians, speech and language therapy, pharmacy support). Patients had access to usual inpatient care, general practitioners and the primary health-care team. Health care was provided 7 days per week. The control group received usual hospital-based care and, when possible, this was guided by comprehensive geriatric assessment. Participants were recruited from primary care or an acute hospital-based assessment unit, and randomised using a computerised random number generator to hospital at home or hospital in a 2 : 1 ratio in favour of the intervention. We recruited older people who were referred to admission avoidance hospital at home with comprehensive geriatric assessment for an acute medical event. This included people presenting with delirium, functional decline, dependence, falls or immobility as well as those with a history of dementia presenting with physical disease. We excluded people with acute coronary syndrome, those who required acute surgical assessment or had had a suspected stroke and those who refused hospital at home or were considered by the clinical staff to be too high risk for home-based care. The primary end point of 'living at home' (i.e. the inverse of death or living in a residential care setting) was measured at 6-month follow-up, and we also collected data on this outcome at 12 months. Secondary outcomes included the incidence of delirium, mortality, new long-term residential care, cognitive impairment, comorbidity, ability to perform activities of daily living, quality-adjusted survival, length of stay and transfer to hospital. All statistical analyses were by intention to treat. We estimated the resource use, costs and health outcomes in the hospital-at-home

group and hospital group up to the 6-month follow-up point on an intention-to-treat basis. Costs were estimated taking the NHS and Personal Social Services perspectives, as well as the wider societal perspective, which also included the cost of informal care. Following the National Institute for Health and Care Excellence's recent recommendation, we converted EuroQol-5 Dimensions, five-level version, responses at baseline and 6 months to utilities using a crosswalk algorithm developed by EuroQol (Rotterdam, the Netherlands). A sample of trial participants and their caregivers were interviewed from sites that were purposively sampled from participating NHS trusts across the UK. We visited sites to observe local processes and discussed the establishment and running of services with a range of multidisciplinary staff, including managers, commissioners, and primary care and social services representatives. We used a content analysis approach to explore data across participants, services and sites.

Results

Participants were allocated to hospital at home ($n = 700$) or hospital ($n = 355$), and 687 participants in the hospital-at-home group and 345 in the hospital group were included in the analysis. Twenty-three participants were not included in the analysis because they withdrew consent to use their data ($n = 10$), had a deterioration in health that prevented data collection ($n = 4$), had been previously recruited ($n = 4$), lived outside the CGAHAH area ($n = 1$), were aged < 65 years ($n = 1$) or withdrew after randomisation with incomplete data ($n = 3$). All reported relative risks (RRs) were adjusted and are reported for hospital at home compared with hospital. There were no significant differences between the groups in the primary outcome of 'living at home', after either 6 months' follow-up [RR 1.05, 95% confidence interval (CI) 0.95 to 1.15; $p = 0.36$] or 12 months' follow-up (RR 0.99, 95% CI 0.89 to 1.10; $p = 0.80$), or in mortality (RR risk 0.98, 95% CI 0.65 to 1.47; $p = 0.92$), cognitive impairment (RR 1.06, 95% CI 0.93 to 1.21; $p = 0.36$) or activities of daily living (mean difference 0.24, 95% CI −0.33 to 0.80; $p = 0.411$) at 6 months. There was a significant reduction in the risk of living in residential care at 6 months (RR 0.58, 95% CI 0.45 to 0.76; $p < 0.001$) or 12 months (RR 0.61, 95% CI 0.46 to 0.82; $p < 0.001$), a significant reduction in risk of delirium at 1 month (RR 0.38, 95% CI 0.19 to 0.76; $p = 0.006$) and an increased risk of transfer to hospital at 1 month (RR 1.32, 95% CI 1.06 to 1.64; $p = 0.012$), but not at 6 months (RR 0.95, 95% CI 0.86 to 1.06; $p = 0.40$). The mean adjusted Charlson Comorbidity Index difference at 6 months was 0.0002 (95% CI −0.15 to 0.15; $p = 0.10$). There was no significant difference between groups in mortality at 12 months (RR 1.14, 95% CI 0.80 to 1.62), although with some uncertainty. Patient satisfaction was in favour of hospital at home. One participant in the hospital-at-home group was reported to have experienced an adverse event that was unexpected and might have been related to the research, and this was reported to the Research Ethics Committee. At 6 months, there was a mean difference in NHS, personal social care and informal care costs (mean difference −£3017, 95% CI −£5765 to −£269) in favour of the hospital-at-home group. There was a non-significant difference in the amount of informal care provided of −62.76 hours (95% CI −224 to 99 hours) (594.89 hours in hospital-at-home group vs. 657.64 hours in the hospital group over 6 months). There was no difference in quality-adjusted survival. The probability that hospital at home is cost-effective at the National Institute for Health and Care Excellence threshold of £20,000 per quality-adjusted life-year is 97%. Older people and caregivers played a crucial role in supporting the delivery of health care to participants in the hospital-at-home group and in managing an acute deterioration in health. In the context of hospital at home, we identified two areas that differed from care delivered in the hospital: (1) clinical leadership was more distributed across senior members of clinical teams and (2) specialty knowledge and skills were shared beyond the traditional disciplinary inpatient boundaries to ensure a workable allocation of staff for home visits that could be spread across a geographical area. Older people's and their caregivers' social networks and resources played a large role in supporting the older person and managing their health problems in both settings, but these were particularly noticeable in the home setting.

Conclusions

The results from this randomised trial show no apparent difference between the groups in the primary outcome of living at home (i.e. the inverse of mortality or living in new long-term residential care) at 6-month follow-up, although there were differential effects in each component of the outcome. There was little difference in mortality at 6 or 12 months, but the rate of new long-term residential care was significantly lower among those allocated to hospital at home at 6- and 12-month follow-up. There was a significant reduction in new cases of delirium at 1 month in the group allocated to hospital at home, albeit with small numbers, and a significantly higher rate of transfer to hospital in those allocated to hospital at home at 1 month, but not at 6 months. There were no differences in the remaining secondary outcomes. Admission avoidance hospital at home is cost-effective when NHS, Personal Social Service and informal care costs are accounted for, reflecting the importance of using a systems perspective when assessing the cost-effectiveness of service delivery interventions that have an impact on health and social care. Family caregivers often played a crucial role in monitoring their relative during an episode of hospital-at-home care and integrating transitional care arrangements into longer-term strategies. Future randomised trials on the impact of care settings on new episodes of delirium and approaches to self-management and reducing carer burden would add to this evidence base. For hospital at home to evolve and have an impact on a health system, a greater degree of integration with secondary care might also be required, as it is the secondary care component that provides admission avoidance hospital at home with a role distinct from that of existing community services.

Trial registration

This trial is registered as ISRCTN60477865.

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