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Improving the rehabilitation of older people after emergency hospital admission

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ABSTRACT

Purpose: Older adults are at risk of functional decline during emergency hospital admissions. This review aims to understand which exercise-based interventions are effective in improving function for older adults who experience unplanned admissions.

Methods: Database searches identified randomised control trials (RCTs) comparing exercise-based interventions with usual hospital care. The primary outcome was functional status measured by activities of daily living (ADL) scores. Secondary outcomes were length of hospital stay (LOS), mortality and readmissions. Sub-group meta-analyses were conducted on interventions delivered in-hospital only compared with interventions provided both in hospital and after discharge.

Results: After reviewing 8365 studies, nine were eligible for inclusion. Seven were included in the meta-analysis. Participants from five countries had a mean age of 79 years (1602 participants). Usual care varied considerably and the interventions showed heterogeneity, with different combinations of strengthening, resistance, high-intensity or mobility exercises. There were limited descriptions of exercise intervention delivery and participant adherence. There is low-quality evidence supporting exercise interventions that have both in-hospital and post-discharge components (3 trials, SMD 0.56 (−0.02, 1.13)). Trials involving only in-hospital interventions were inconclusive for functional gains (5 trials, SMD −0.04 (−0.31, 0.22)).

Conclusions: Exercise-based rehabilitation for older patients after emergency hospitalisation improves functional ability if the intervention starts in hospital and continues after discharge. No conclusions can be made regarding the effective exercise 'dose' or content.

Implications: Understanding the components of exercise interventions will improve service planning and delivery. Further studies are needed to understand the effective 'dose' and content of exercise for hospitalised older adults.

1. Introduction

Emergency hospital admissions for older patients are increasing [1,2]. Hospitalisation is a risk factor for functional decline and disability [4], and can be a 'deconditioning' process leading to loss of independence [3]. Functional decline during an acute hospital admission is multifactorial in nature; contributing factors include lack of activity and immobility, the effects of acute illness in the context of chronic diseases, and the vulnerability of older patients to polypharmacy and nutritional deficiencies [5]. The consequences include reduced muscle strength, reduced physiological reserve and increased risk of falls [3]. Rehabilitation can restore personal autonomy, reduce disability, and reduce the rates of institutionalisation in this older age group; however, the content of optimal rehabilitative interventions is not clear [5].

Current rehabilitative interventions in hospital aim to restore functional ability to a level where patients can be safely discharged from hospital, but setting this target for rehabilitation may not be effective at restoring personal autonomy. The current model for medical care for older patients is centred on the comprehensive geriatric assessment (CGA) [5], which restores function through collaborative work by multi-disciplinary teams using a variety of interventions. CGA reduces rates of institutionalisation for older adults [6] as well as mortality [7]. These programmes often have a significant physical component using exercise to maintain muscle strength [8]. Exercise

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during inpatient hospital admission is not associated with increased adverse events and allows more patients to be discharged home with improved physical function [8,9].

This review aims to evaluate which rehabilitation interventions are effective at restoring function in older patients requiring a hospital admission for an acute medical illness. Previous reviews have suggested that targeted CGA based rehabilitation early in a hospital admission can improve function, reduce mortality and the risk of institutionalisation compared with usual care [6,8,9]. However, there was great variation in the duration, content, measures used to assess functional ability and the type of patient (medical, surgical and orthopaedic) involved in the exercise interventions evaluated.

Consequently, the optimal exercise intervention for older patients remains unknown [3,5] and an update of the evidence, concentrating on an in-depth description and synthesis of the intervention components, is warranted. This review will concentrate on the effective 'dose', content and timing of rehabilitation.

1.1. Aim

To understand which exercise-based rehabilitation interventions are effective in improving function for older adults who are hospitalised during an unplanned emergency admission for an acute medical condition.

2. Methods

2.1. Objectives

To determine the effectiveness of exercise-based rehabilitation programmes that improved the functional status of older adults after an emergency hospital admission as measured by their activities of daily living (ADL). Secondary outcomes included length of hospital stay (LOS), mortality and readmission.

2.2. Eligibility criteria (Appendix A)

Studies were included in this review if they met the following inclusion criteria:

- Participants were 65 years or older and had been admitted to hospital via the emergency department or in an unplanned way.
- Participants' admission to hospital lasted at least 4 h.
- Randomised controlled trials comparing an exercise-based rehabilitation intervention with usual hospital care.
- Exercise was the main component of the intervention and was delivered by a healthcare professional, starting after an emergency hospital admission and took place in hospital or at home.
- The comparison group was usual hospital care which was defined as an assessment conducted by a health professional resulting in the provision of an intervention to ensure that the patient was safe to be discharged home.
- Assessed at least one measure of function using either: Barthel index (BI), Katz ADL, Instrumental ADL (IADL) and Nottingham Extended ADL, Short Form Health Surveys SF36 or SF12, Elderly Mobility Score (EMS).

Exclusion criteria:

- Greater than 20% of the included patient sample were under the age of 65 years.
- Participants recruited from the community without an acute medical illness requiring an emergency department visit.
- Participants with surgical or orthopaedic treatment or who had disease processes requiring specialised rehabilitation such as stroke.
- The intervention was designed to reduce the incidence of falls. These studies were excluded as they have been described in detail elsewhere [10].

2.3. Information sources and search strategy (Appendix B)

The following databases were searched from inception to the 10th February 2017; CINAHL, Cochrane Library, Embase, Ovid Medline, OTSeeker, PEDRO, and Web of Science. The search strategy is detailed in Appendix B.

2.4. Study selection

Two authors (SM and AH) screened the studies based on title and abstract and independently selected papers for inclusion after full text retrieval. Any differences in the results were resolved through discussion.

2.5. Data collection process

Standardised data extraction tables were adapted from the Template for Intervention Description and Replication (TIDieR) guide to ensure systematic data retrieval [11]. Two authors (HR and SF) extracted data on the study participants (mean age), usual care, study intervention (components, frequency and timing), intervention provider (single healthcare professional, multi-disciplinary team), location (hospital, community setting, home), and study outcomes. The results were reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Fig. 1) [12]. The Cochrane Collaborations Tool for assessing bias was used to judge the risk of bias and methodological quality of the included studies [13].

2.6. Study quality

Methodological quality was assessed using the 12-item risk of bias tool. The studies were assessed according to the following categories: sequence generation, allocation concealment, participant and staff

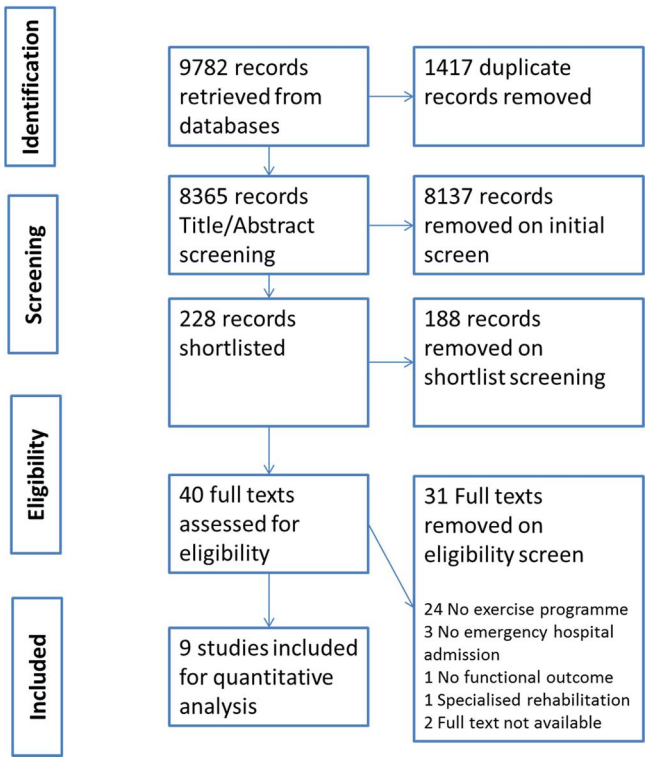

Fig. 1. PRISMA Flow Chart.