

Physiotherapy and Falls

Finding the Balance

Introduction

There is a substantial body of evidence that clearly demonstrates that tailored physical exercise programmes are highly effective in reducing risk and rate of falls in older adults (aged 65+). The aim of this document is to provide a balanced overview, synthesising the key findings from the published evidence, to provide commissioners with a clear understanding of the effectiveness of physical therapy and exercise in preventing falls in the older population.

How common are falls?

Studies estimate that approximately a third of adults aged 65+ in the community will experience at least one fall over a one year period (Tinetti, 1988), equating to over 3 million falls per year in the UK. The risk of falls and their associated complications rise steadily with age and frailty level. Of those who are 75+ years, approximately 32%-42% fall each year. Additionally, previous fallers are more likely to have another fall; studies estimate between 50% - 67% risk of experiencing a further fall in the subsequent year (Tinetti, 1989; Nevitt, 1989).

1 in 3 people aged 65+ (over 3 million) fall every year

The rate of falls is estimated to be 0.5 falls per person per year

Previous fallers have over 50% risk of experiencing a fall in the subsequent year

Many population based studies have described the rate of falls in various settings, most notably the community and in long-term care settings such as nursing homes. In the 65+ age group, conservative estimates of the rate of falls range from 0.3 – 1.6 per person annually. The figure is estimated to be double for those in the 75+ age group. Similarly, older adults living in nursing and care homes have much higher rates of falls, ranging from 0.6 – 3.6 falls annually (Rubinstein, 2006). Overall, NICE (2013) suggests that in England, the rate of falls is 0.46 falls per patient annually.

The burden on the NHS

Falls and fractures have a major impact on the NHS, costing more than £2.3 billion per year (College of Optometrists/British Geriatrics Society, 2011). The number of people aged 65+ is projected to rise by nearly 50% (48.7%) from 10.8 million to over 16 million in the next 20 years; a crude estimate of the cost (excluding inflation) is assessed to be in the region of £3.4 billion.

Hip fractures are the most expensive osteoporosis fracture with the cost per patient estimated by the Royal College of Physicians to be £16,000 (£12,000 direct NHS costs, £4000 local authority costs and not accounting for missed work days). Although only 5% of falls result in fracture (Tinetti 1988), the impact on the NHS is significant, with the total annual cost of these fractures calculated as £1.7 billion (Torgerson 2001). This figure increases to over £2 billion when the social care costs are also included (The National Hip Fracture Database National Report, 2011).

Falls and fractures cost the UK NHS more than £2.3 billion every year

The projected rise in the aging population could increase this cost to over £3.4 billion

Although only 5% of falls result in fractures, they cost the NHS £1.7 billion annually

Falls account for over half of hospital admissions for accidental injury

Falls also have a significant impact on emergency care; falls account for 10 – 25% of all ambulance call-outs (Dept of Health 2009, Snooks et al, 2006) at an average cost of £115 per call out (Newton et al, 2006). In addition, falls account for over half of hospital admissions for accidental injury.

Besides the economic cost, there is also the significant human cost to the patient resulting in the loss of confidence, loss of independence, diminished quality of life and mortality. Falling also affects the family members and carers of people who fall (NICE, 2013).

Falls result in loss of confidence, independence, quality of life and mortality

Falls also affect family members and carers

Can exercise prevent falls?

There is clear evidence falls amongst the older community-dwelling population can be prevented using carefully designed and tailored physiotherapy programmes, delivered as either group exercise or individualised therapy in the home.

Falls intervention programmes can vary greatly from one programme to another; some programmes deliver only one type of exercise with the aim of addressing one issue (such as balance), whereas others may include a variety of exercises with the aim of addressing multiple attributes (such as balance, gait speed, flexibility and strength). Both types of physiotherapy interventions have been shown to be effective.

Community - Group exercises

A recently updated review of the evidence in falls prevention (Gillespie, 2012) was published by the Cochrane Collaboration. The authors considered 16 randomised controlled trials (RCTs) comparing programmes delivering exercise and standard care (in many cases, this was no intervention). A total of 3622 patients were included in the analysis. Of the 16 RCTs comparing exercise against the control, all but one trial favoured exercise in reducing falls, with half also demonstrating statistical significance. A meta-analysis of the combined data demonstrated the effectiveness of group exercise: the rate of falls was shown to be reduced by 29% and the risk of falls reduced by 15%. Group exercise was observed to be effective in both populations that were at a higher risk of falls as well as populations that were not identified as high risk.

Exercise interventions should be supervised and supported by physiotherapists in order to monitor progress. NICE (2013) guidelines stress that where group exercises are used, they must be targeted and tailored to an older population to be effective.

Community - Individual exercise regimes

Group exercise programmes may not always be suitable for all patients, who may prefer (or be better suited to) a home-based programme.

Physiotherapy programmes can reduce the rate of falls by a third

Group exercises must be targeted and tailored to an elderly population

Gillespie examined 7 RCTs consisting of 951 patients assessing the effectiveness of individual exercise programmes. Home-based exercise was shown to reduce the rate of falls by 32% and the risk of falling by 22%.

Overall effectiveness in the community

In a separate systematic review, Sherrington et al (2011) reviewed 54 randomised controlled trials considering the effectiveness of well-designed exercise interventions. Unlike Gillespie (2012), the authors did not distinguish between the mode of delivery (group or home-based). The authors estimated a more conservative but nonetheless statistically significant reduction (16%) in the rate of falls when compared with control (no intervention or standard care). The authors concluded that this provided confirmation that exercise as a single intervention can prevent falls.

Hospitals and Nursing homes

Unfortunately, the effect of single exercise programmes on reducing the rate or the risk of falls in adults aged 65+ seems to be unclear in hospitals and nursing homes. Both Cameron et al (2010) and Sherrington et al (2013) concluded that the reduction in falls in institutionalised individuals was inconclusive. However, Cameron (2010) found that when the intervention programme was delivered by a team of multidisciplinary healthcare workers, the impact was significant; the rate of falls was reduced by 31% and the risk of falls by 27%. The use of multifactorial interventions has also been advocated by NICE (2103) guidelines.

The most effective intervention programmes in nursing homes are delivered by a multidisciplinary co-ordinated team of healthcare workers

The effect on falls related injuries

Whilst it is clear that tailored exercise programmes are effective in reducing the rate and risk of falls in the community, until recently, it was unclear whether these programmes can also prevent injuries caused by falls. El-Khoury et al (2013) conducted a systematic review of 17 RCTs (4305 patients), showing overwhelmingly that fall prevention programmes not only reduce the rates of falls but also prevent injuries resulting from falls in older adults in the community setting. For all injurious falls, the reduction was estimated at 37%.

The protective effect appeared to be the greatest for the most severe fall related injuries, with an estimated reduction of 43% for serious injuries and 61% for falls resulting in fractures.

How much exercise is required?

Sherrington et al (2011) considered the effect of the amount of exercise delivered in reducing the rate of falls in the older adult population. The authors found that the effect was considerably more pronounced in programmes that delivered 50+ hours (23% reduction in the rate of falls) compared to those that had less than 50 hours (7% reduction). This is supported by Gillespie (2013), which found successful exercise programmes delivered an average (median) of approximately 50 hours of exercise. Sherrington et al (2011) therefore recommend that exercise programmes should be delivered for 6 months with duration of 2 hours per week.

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The current dose of physiotherapy where available is too inadequate to be effective; The Royal College of Physicians (2011) survey highlighted that most (79%) exercise programmes are delivered for a duration of 12 weeks or less at a rate of one session per week (74%). This is vastly less than the recommended 50+ hours.

Access to physiotherapy

Whilst it is known that approximately a third of adults aged 65+ will have at least one fall annually, it is less clear what proportion of this age group have access to physiotherapy. In nursing homes, where the risk of falls has been shown to be higher than in the community (Rubinstein, 2006), a survey indicated that only 10% of residents were in receipt of physiotherapy, mostly through private physiotherapists employed by the nursing home (Barodawala et al, 2001). Therefore it is likely that the provision of physiotherapy available through the NHS in the wider community setting may be less than 10%.

The British Geriatric Society's "Quest for Quality" document indicates that there are substantial equity concerns about who is accessing physiotherapy, even leaving aside this underprovision. They add that while this problem is recognised, there has been little or no consensus over how to remedy the issue and so individual care needs are not being properly provisioned for.

50+ hours of physiotherapy is required to be effective

Currently, most exercise programmes are inadequate – majority are for 12 weeks or less

Only 10% of residents in nursing homes have access to physiotherapy.

Cost effectiveness of physiotherapy

Currently, economic evaluations of falls prevention programmes are very limited (cf. Gillespie et al., 2012 and Davis et al., 2010). This is further complicated by the fact that where economic evidence does exist, they are derived from international studies where the underlying healthcare system may differ from the NHS. Nonetheless, simple estimates can be extrapolated from the reduction in falls. A 61% reduction in fall related fractures (as estimated by El-Khoury et al, 2013) would reduce this cost by £1 billion, though the net saving would also need to account for the cost of delivering physiotherapy.

Of the thirteen studies identified as including a full cost-effectiveness analysis by Gillespie et al (2012), three showed a cost-saving over the trial period. These studies were performed on heterogeneous populations, so this should not be taken as evidence that physiotherapy is unlikely to be effective at preventing falls. The key finding from this review and an earlier review by Davis et al. (2010) was that single factor interventions were more likely to be cost-effective.

Economic evaluations for falls prevention programmes are very limited.

International studies have shown falls prevention exercise programmes to be cost effective saving approximately £76,000 per 1000 patients (aged 80+)

Cost effectiveness of physiotherapy

The most effective intervention in the review was the Otago falls prevention exercise programme, described by Robertson and Campbell (2008). The cost to deliver the programme to a 1000 participants aged 80+ was calculated as NZ\$213,000, which was anticipated to have prevented 541 falls resulting in a net saving of NZ\$148,303 per 1000 participants. When translated into sterling (May 2014 conversion rates), this would convert to a saving of approximately £76,000 per 1000 patients or a total of £220 million pounds saving when extrapolated to the population of aged 80+ adults in the UK; for every £1 spend, a potential saving of £0.70 may be realised. It must be noted that these estimates have the caveat that the healthcare system in New Zealand may not operate the same tariffs as the NHS and the currency conversions may also fluctuate. Nevertheless, the study is indicative of substantial potential savings when considering physiotherapy for fall prevention.

The Otago Fall Prevention Exercise Programme appears to be the most cost-effective single-factor intervention described in the literature.

If the savings achieved in New Zealand can be duplicated in England, the NHS could save £222m per year

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