Development of a self-managed loaded exercise programme for rotator cuff tendinopathy

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Abstract

This paper describes a self-managed loaded exercise programme which has been designed to address the pain and disability associated with rotator cuff tendinopathy. The intervention has been developed with reference to current self-management theory and with reference to the emerging benefit of loaded exercise for tendinopathy. This self-managed loaded exercise programme is being evaluated within the mixed methods SELF study (ISRCTN 84709751) which includes a pragmatic randomised controlled trial conducted within the UK National Health Service.

Word count 2000

Key words: rotator cuff tendinopathy, exercise, rehabilitation, self-management

Introduction

In 2010, the UK government published its' white paper Equity & Excellence: Liberating the National Health Service (NHS) [1]. The emphasis of this paper was towards improving the outcomes of healthcare with the patient at the centre of every decision that is taken. However, this proposition is in the face of significant financial challenges and the need for the NHS to deliver unprecedented efficiency gains.

Self-management has been proffered by some as one solution to this increasingly untenable situation [2]. In a situation of rising demand and falling supply, strategies to facilitate self-managed behaviour offer an opportunity to redress the balance by reducing the requirement and hence demand for regular contact with health care professionals.

As well as offering a pragmatic solution to an organisational issue, self-management offers opportunities to individualise care and there is evidence to suggest that an approach where patients are encouraged to take responsibility for their own care is at least comparable to treatment requiring regular clinic attendance [3,4]. Upon this background, this paper describes a self-managed exercise programme for rotator cuff tendinopathy.

Rotator cuff tendinopathy is a common problem with increasing prevalence as age increases [5,6]. Hence it is expected that the demand for health care in this area will increase as the population ages. It has also been identified that this condition is resistant to treatment and possibly recurrent in nature in certain populations [7-9] and so it is hypothesised that outcomes will be superior where the patients are equipped to deal with this condition on an on-going basis. Additionally, over recent years, there has been growing recognition of the benefit of loaded exercise for rotator cuff tendinopathy [3,10-12] and in 2012, the National Institute for Health Research funded a mixed methods study to evaluate the clinical and cost-effectiveness of a self-managed exercise programme versus usual physiotherapy for chronic rotator cuff disorders: the SELF study (ISRCTN 84709751) [13].

According to the guidance offered by Craig et al [14] self-managed loaded exercise should be regarded as a complex intervention because of the number of potential interactions between the components of the intervention. To facilitate the process of appraisal and implementation, an evaluation of a complex intervention should include a description of the intervention as an essential step of reporting [14,15]. Thus, the purpose of this paper is to offer a full description of the experimental self-managed exercise intervention for the SELF study.

Overview of the SELF study

The SELF study is a mixed methods study to evaluate the clinical and cost-effectiveness of a self-managed exercise programme versus usual physiotherapy for chronic rotator cuff disorders. The study includes a randomised controlled trial (RCT) where participants will be allocated to self-managed loaded exercise (experimental) or usual physiotherapy (control) and followed-up after three, six and 12 months. The primary outcome measure for the RCT is the shoulder pain and disability index (SPADI). The full protocol has been published [13].

An introduction to the technology

The intervention is self-managed loaded exercise. The exercise, prescribed by the physiotherapist but completed by the patient, involves exercising the affected shoulder against gravity, a resistive therapeutic band or hand weight over three sets of ten to 15 repetitions twice per day. This exercise can be uncomfortable but is prescribed to ensure that this is manageable. Exercise prescription is guided by symptomatic response requiring that pain is produced during exercise but symptoms are no worse upon cessation [16,17]. Participants with more severe symptoms tend to commence a lighter regime initially and a typical outline programme is presented in figure 1 which is adapted to meet individual needs.

Although there is emerging evidence supporting loaded exercise as the type of exercise to be prescribed [11] the optimal dose is unknown. In reporting favourable outcomes in people complaining of shoulder pain, Bernhardsson et al [10], Holmgren et al [11] and Jonsson et al

[12] prescribed three sets of 15 repetitions completed twice per day. Bernhardsson et al [10] and Jonsson et al [12] maintained this programme for 12 weeks whilst Holmgren et al [11] maintained their programme for eight weeks before reducing to one set of exercise per day between weeks eight to 12. As well as consistency in terms of sets and repetitions all of these studies required the exercise to be uncomfortable. These parameters are consistent with those proposed here. However, in contrast to these studies a time-frame for the intervention has not been pre-specified. Instead the treating physiotherapist and patient will determine the point of treatment cessation. It is recognised that a favourable response might require a minimum of three months [16] but the choice to omit a pre-specified time frame reflects the nature and response times of individual patients [18] and thus is more pragmatic in nature.

In keeping with Jonsson et al [12] the intervention comprises only one exercise. This is in contrast to Berharddson et al [10] and Holmgren et al [11] who prescribed multiple exercises. A single exercise approach is preferred here for two reasons: First, as a pragmatic time-saving solution [19]. Low levels of engagement with exercise programmes are a widely recognised problem and it is suggested that single exercise prescription minimises some of the barriers in terms of time to complete and recall. Secondly, the incremental benefit of adding more exercises that are theoretically stressing the same tissue is unknown and possibly unnecessary.

The self-managed framework

The exercise is operationalized within a self-managed framework. Here self-management refers to situations where people are encouraged to actively manage their symptoms, treatment, consequences and life-style changes associated with their condition [2,20]. This process is facilitated through an equal therapeutic alliance, or partnership, between patient and therapist. The self-managed framework consists of components currently regarded as

effective mechanisms by which to enhance self-efficacy and facilitate self-management [21,22] including:

- Knowledge translation
- Exercise/ skill acquisition
- Self-monitoring
- Goal setting
- Problem solving
- Pro-active follow-up

In line with the Common Sense Model of self-regulation of health and illness [23-26], how the patient perceives the problem is pivotal. Success of the intervention is dependent upon the patient interpreting their pain response in a way that facilitates the use of exercise as a management strategy. If beliefs persist that the pain is a sign of tissue damage and that rest is required to enable the tissue to recover then it is doubtful that the programme could be implemented successfully. Such an appraisal would result in avoidance behaviour and would preclude any level of engagement. To address this concern, the patient is encouraged to communicate their understanding of the problem and the therapist is encouraged to frame the discussion from the perspective that the muscles and tendons are de-conditioned (or weakened or lacking fitness) and need a progressive programme of exercise to restore condition and function. Description of tissue based pathology, e.g. rotator cuff tear, is avoided, or challenged. In this situation, reliance is placed upon the development of a therapeutic alliance where doubts and concerns can be expressed by the patient and reassurance offered by the physiotherapist along with an acceptable explanation of the cause of the problem. The purpose of this knowledge translation is to facilitate understanding upon which a successful partnership can be developed. Understanding is re-visited using simple questions such as: What do you understand is the cause of your problem? Why could exercise help?

Enhancement of self-efficacy, defined as the confidence to perform a specific task or behaviour [25], which is one of the major constructs of Bandura's Social Cognitive Theory of behaviour change [25], is a key goal of this self-management programme. Four potential strategies to enhance self-efficacy have been suggested; mastery, modelling, interpreting physiological signs and feedback/ persuasion [22]. Enhancement of self-efficacy is seen as a key component to facilitate regular engagement with the programme. A single exercise is prescribed and although progressions and regressions of the exercise are discussed, only one exercise is completed at any one time. The reason for this restricted prescription is pragmatic in nature, as discussed previously, but it is expected that a simple prescription will also facilitate mastery of the task [25]. The patients have the opportunity to observe the therapist undertaking the exercise and will subsequently model their behaviour on that of the therapist whilst repeating the exercise themselves. This will be re-enforced by a diagram, drawn by the patient, on an exercise diary (figure 2) which will serve as a visual memory stimulus.

Self-monitoring and appropriate interpretation of physiological signs is regarded as a cornerstone of successful self-management [25]. Within this programme the patients are encouraged to monitor their pain response whilst exercising, which is recorded in the self-report diary, in the knowledge that pain should be produced whilst the exercising but should be no worse upon cessation [17]. When the pain response abates this is the stimulus to progress the exercise. Such a response is in line with others who advocate loaded exercise [10-12,16,17,27]. In contrast to others who have used a numeric pain rating scale, for example pain no greater than 5/10 [11], to guide exercise progression, the intervention described here enables the patient to judge what is manageable in terms of symptom response. This decision reflects individual perceptions of what constitutes acceptability in terms of pain. Some patients might be more tolerant and more willing than others to provoke pain whilst exercising and it is felt unwise to limit the potential of some because of unsubstantiated fears relating to potential tissue damage.

At the initial meeting between physiotherapist and patient, goals are set using the patient specific functional scale [28] as a guide. A goal is negotiated, for example being able to reach into a cupboard, and the current level of difficulty is established. This is monitored, discussed at follow-up appointments and new goals set as appropriate. Such a component has the capacity to be a useful form of mid- to long term self-monitoring by offering reassurance regarding progress. The primary aim of the self-managed exercise programme is to facilitate movement and functional restoration and goal setting is encouraged along these lines.

Following this the patients are encouraged to consider any barriers to implementation. Some pragmatic solutions to common problems, particularly time limitations, are factored in to the intervention but the idea is raised pro-actively by the physiotherapist at the initial meeting by asking the patient how confident they are that they will be able to complete the task in hand. Any uncertainty is discussed and the patient is encouraged to consider potential solutions. Barriers to implementations are also raised and discussed with reference to the exercise diary at subsequent follow-up appointments.

The patients are offered the opportunity to return to the clinic at a convenient and appropriate time with the intention that this meeting will offer the opportunity for useful feedback and possibly the opportunity for persuasive intervention by the therapist if difficulties have been encountered [22]. Typically follow-up appointments are scheduled on a monthly basis to begin with but the needs of the patients inform this decision. For example, some patients feel confident and able following the initial meeting and do not require a scheduled follow-up appointment, only the opportunity to contact the physiotherapist should things not go to plan. Conversely some patients will return to the physiotherapist within a few days to seek re-assurance and guidance where necessary. The flow of a typical follow-up session is displayed in figure 3.

This intervention has been designed with practice context in mind where typical physiotherapy appointments consist of an initial session lasting 40 minutes and subsequent sessions lasting 20 minutes. The intervention requires minimal training and can be adopted in the current practice context from a logistical perspective.

Conclusion

This paper has described a self-managed loaded exercise programme which has been designed to address the pain and disability associated with rotator cuff tendinopathy. This intervention is being evaluated within the mixed methods SELF study which includes a pragmatic randomised controlled trial conducted within the UK NHS. The clinical and cost-effectiveness of the self-managed exercise programme compared to usual physiotherapy will be reported at the conclusion of the SELF study.

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Conflict of Interest Statement

The authors report no conflicts of interest.

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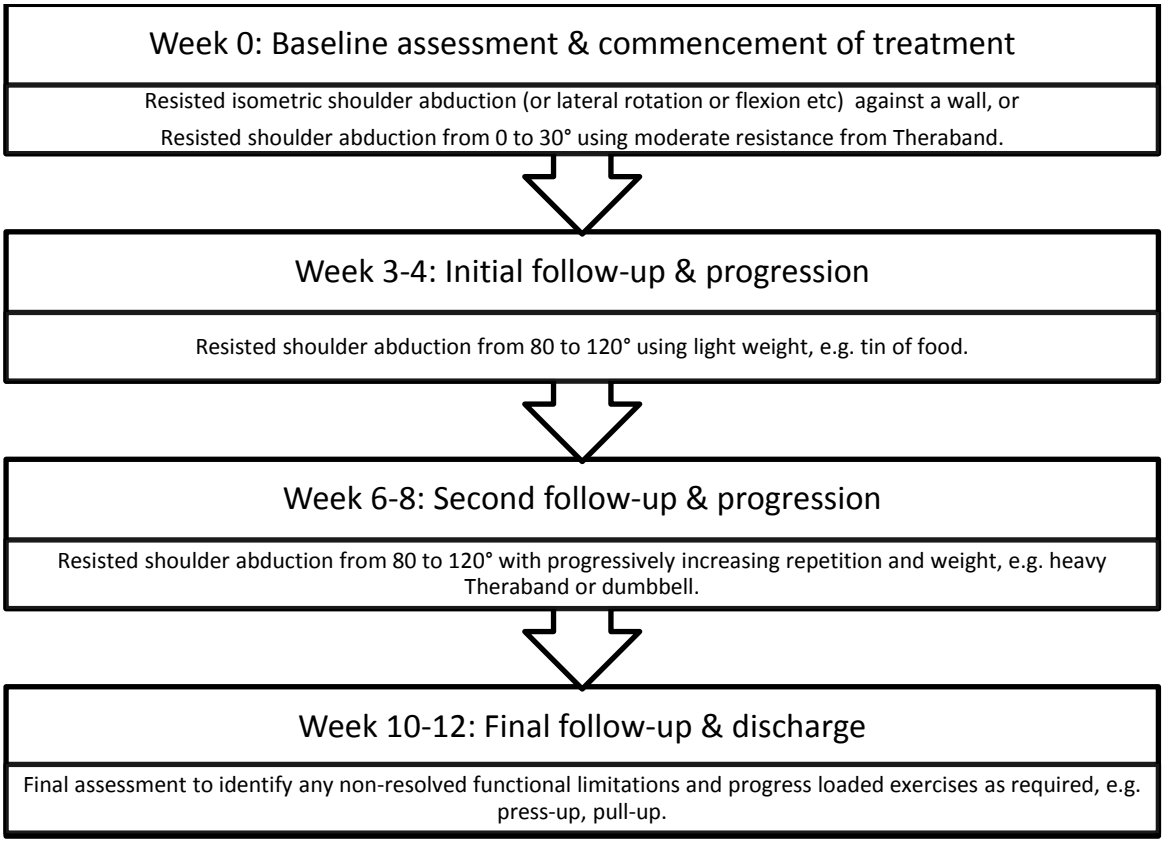


Figure 1 Typical loaded exercise programme and progression

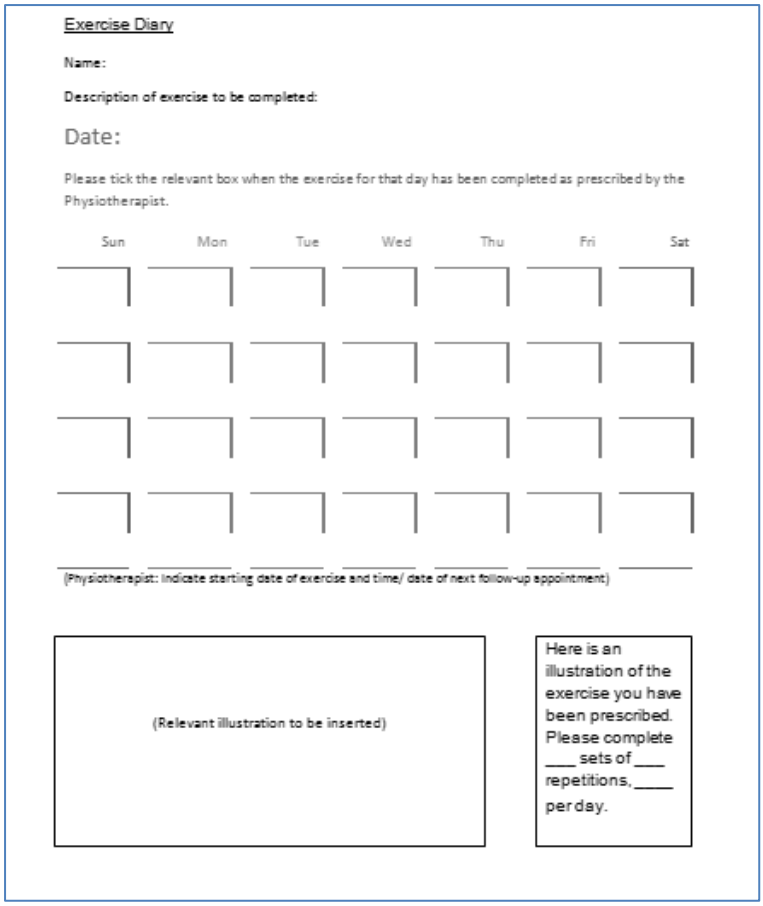
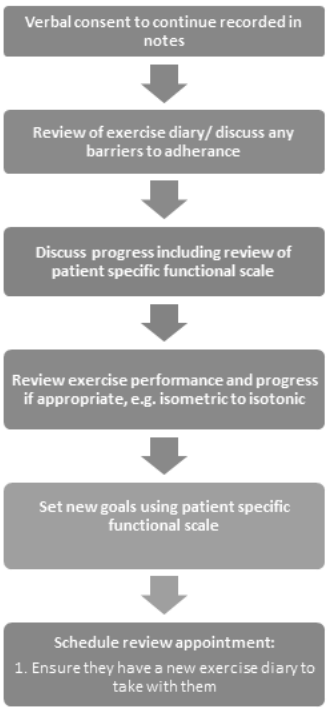


Figure 2 Sample exercise diary



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353 Figure 3 The flow of a typical follow-up appointment

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