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Systematic review

The effectiveness of therapeutic exercise for joint hypermobility syndrome: a systematic review

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Abstract

Background Joint hypermobility syndrome (JHS) is a heritable connective tissue disorder characterised by excessive range of movement at multiple joints accompanied by pain. Exercise is the mainstay of management yet its effectiveness is unclear.
Objectives To establish the effectiveness of therapeutic exercise for JHS.
Design Systematic literature review.
Data sources A search of nine online databases, supplemented by a hand search and snowballing.
Study eligibility criteria (participants and interventions) People diagnosed with JHS (rather than asymptomatic generalised joint laxity); therapeutic exercise (of any type) used as an intervention; primary data reported; English language; published research.
Study appraisal and synthesis methods Methodological quality was appraised by each reviewer using Critical Appraisal Skills Programme checklists. Articles were then discussed collectively and disagreements resolved through debate.
Results 2001 titles were identified. Four articles met the inclusion criteria, comprising one controlled trial, one comparative trial and two cohort studies. All studies found clinical improvements over time. However there was no convincing evidence that exercise was better than control or that joint-specific and generalised exercise differed in effectiveness.
Limitations The studies used heterogeneous outcome measures, preventing pooling of results. Only one study was a true controlled trial which failed to report between-group statistical analyses post-treatment.
Conclusions and implications of key findings There is some evidence that people with JHS improve with exercise but there is no convincing evidence for specific types of exercise or that exercise is better than control. Further high quality research is required to establish the effectiveness of exercise for JHS.

Keywords: Joint hypermobility; Benign hypermobility syndrome; Exercise; Exercise therapy; Systematic review

Introduction

Rationale

Joint hypermobility syndrome (JHS) has been defined as a "*heritable disorder of the connective tissues characterised by hypermobility, often affecting multiple joints, and musculoskeletal pains in the absence of systemic inflammatory joint disease such as rheumatoid arthritis*" [1]. Variation in diagnostic criteria makes interpretation of published literature difficult but the revised Brighton Criteria [2] are now widely used. JHS is generally accepted to be more prevalent in children, in females and in some ethnic groups. Approximately 5% of women and less than 1% of men experience symptomatic joint hypermobility [3].

Joint pain in JHS is thought to be caused by excessive movement increasing stress on joint surfaces, ligaments and neighbouring structures [3]. Pain may cause muscle inhibition, leading to atrophy and reduced joint control [4]. Proprioceptive acuity may also be adversely affected [5,6], perhaps due to joint mechanoreceptor damage [7]. The inability to acknowledge extreme joint ranges may create an even more unstable joint by further stretching supporting

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structures. JHS can be accompanied by fatigue [8], anxiety and depression, impacting negatively on social function [9] and thereby having a substantial impact on individuals.

Acute pain episodes may be managed using taping, bracing or splinting [4] or with non-steroidal anti-inflammatory drugs [3]. However education [10,11] and therapeutic exercise [12] are the mainstays of long term management. Encouraging an active lifestyle may improve function and enhance quality of life [13].

Strengthening exercises targeting stabilising muscles around hypermobile joints might enhance joint support throughout movement and reduce pain [14,15]. Closed chain exercises may reduce strain on injured ligaments [16], enhance proprioceptive feedback [4], and optimise muscle action [17]. Coordination and balance exercises such as wobble board training may improve proprioception [18,19]. Neural pathways and movement patterns consisting of muscle pair co-contractions are reinforced [20]. This can encourage compensation reactions [21], preventing joints moving into extreme ranges and avoiding further injury [3].

In contrast to specific muscle training, a generalised exercise approach can also be taken, addressing cardiorespiratory, musculoskeletal and neurological aspects of movement [22] and reducing general deconditioning [23]. Hydrotherapy can be a successful medium in which to perform such exercises [22], challenging balance and core strength within a supportive environment, with water resistance and buoyancy increasing exercise variability [24].

Although exercise is widely regarded as a core component of JHS management [4,12], there is no clear consensus about its effectiveness. There is generally a lack of high quality research which might contribute to the prescription of inappropriate interventions [25] and negative experiences of physiotherapy [1]. It is timely that the available evidence for exercise should be systematically evaluated.

Objectives

This systematic review aimed to establish the effectiveness of therapeutic exercise for JHS. Due to the small number of studies identified in initial scoping work, it was decided not to prescribe the specific type of exercise or the clinical outcomes.

Methods

This review has been reported in accordance with PRISMA recommendations [26].

Protocol and registration

No prior protocol was published.

Eligibility criteria

The following inclusion criteria were applied to retrieved records: (1) people with joint hypermobility syndrome (rather than asymptomatic generalised joint laxity); (2) therapeutic exercise (of any type) used as an intervention; (3) human participants; (4) primary data reported; (5) English language; (6) published research. The criteria were applied in turn to the titles, abstracts and full texts. No date restrictions were used to maximise record retrieval. All study designs were included.

Information sources

Following discussion and advice from a University librarian, nine online databases were searched. These were Allied & Complementary Medicine (AMED); British Nursing Index (BNI); Cumulative Index to Nursing & Allied Health Literature (CINAHL); Cochrane Library; Embase; Healthcare Management Information Consortium (HMIC); Medline; Physiotherapy Evidence Database (PEDro); and SportDiscus. The OVID platform was used to search Embase and HMIC; EBSCO for AMED, CINAHL, Medline and SPORTDiscus; and ProQuest for BNI. The electronic search was supplemented by a manual hand search of relevant journals (Supplemental Information, Table A) and by snowballing of full articles retrieved.

Search

Key search concepts were identified as ‘joint hypermobility syndrome’ and ‘therapeutic exercise’. Team discussion and an online thesaurus were used to identify alternative terms for the search key words. The final search terms are presented in Supplemental Information, Table B. The search strategy for EBSCO, OVID, ProQuest and the Cochrane Library were identical. PEDro required an adapted search strategy, where each search term for the ‘joint hypermobility syndrome’ concept was searched individually. This was felt to be sensitive enough for this physiotherapy-specific database. The search was conducted on 23rd November 2012.

Study selection

Duplicates were removed and the inclusion criteria applied to the titles of retrieved records. The abstracts of all remaining records were then obtained and the criteria applied again. Finally the full texts of remaining articles were obtained and the process repeated. Snowballing from the reference lists of the full articles maximised identification of relevant literature [27]. All decisions were discussed and agreed as a group, ensuring robust application of the inclusion criteria.

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