Exercise for osteoarthritis of the knee and risk of subsequent osteoporotic vertebral fractures

Citation

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Background
The evidence provided in this review aims to support decision-making for the clinical review panel currently investigating a related incident. The review provides evidence about low intensity rehabilitation exercise programs for patients with osteoarthritis of the knee and whether or not participating in exercise increases risk to patients with history of osteoporotic vertebral fractures.

Question
Does participation in a low intensity rehabilitation exercise program for osteoarthritis of the knee result in increased risk of subsequent osteoporotic vertebral fractures for patients with previous history?

Summary of findings
This review focused on identifying recent, high quality evidence to inform decision making. A search of the TRIP database and Google from 2013 onwards identified three clinical practice guidelines [1-3] and one handbook for prescribing non-drug interventions [4]. Papers were reviewed to identify whether patients with a previous history of osteoporotic vertebral fracture who are participating in low intensity exercise as part of a rehabilitation program for osteoarthritis of the knee are at greater risk of subsequent osteoporotic vertebral fractures.

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<th>Guideline</th>
<th>Quality of the Guideline</th>
<th>Practice Recommendation</th>
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<td>Royal Australasian College of General Practitioners (RACGP) 2018 clinical practice guideline for managing knee and hip osteoarthritis focuses on all adults diagnosed with symptomatic osteoarthritis of the hip and/or knee up until referral for joint replacement. While this guideline is intended for use in the primary care setting it is considered relevant to other health professionals who treat people with osteoarthritis</td>
<td>High</td>
<td>Exercise for management recommended. Specifically, regular, varied, high-intensity resistance training and progressive balance training. It notes that high-impact training should be avoided by individuals at high risk of fracture, avoiding forward flexion and twisting in vertebral osteoporosis, programs should be individualised and may require supervision [1].</td>
<td>Recommendations are based on low and very low-level evidence</td>
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<td>The Institute for Clinical Systems Improvement (ICSI) 2017 clinical practice guideline for prevention, diagnosis and management of bone loss.</td>
<td>High</td>
<td>Counselling patients on lifestyle modifications including physical activity recommended. Suggests that the benefits to implementing guideline recommendations for physical activity (particularly weight bearing exercise) are that it</td>
<td>Recommendations are based on low level evidence</td>
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Exercise for osteoarthritis of the knee and subsequent vertebral fracture: An Evidence Snapshot

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<td>RACGP (2016) Exercise for preventing bone loss and reducing fracture risk handbook. Aimed at postmenopausal women and older men at risk of falls and fracture with the aim of improving bone mineral density (BMD) or slowing bone loss, as well as improving muscle mass, strength and function.</td>
<td>High</td>
<td>A multimodal exercise program including progressive resistance training in combination with multidirectional, weight bearing exercises and challenging balance and mobility training is recommended. The handbook provides precautions that exercise training is generally safe and effective for most patients with an increased risk for osteoporosis, but some activities may need to be modified. Individuals at high risk should receive advice in safe lifting and postural techniques to avoid dangerous or excessive loading during everyday activities, and they should undertake modified exercises that minimise the risk of falling. The handbook outlines that those with severe osteoporosis or who have previously sustained an osteoporotic vertebral fracture should generally avoid dynamic, explosive and high-impact loads, excessive spinal (trunk) flexion (particularly when lifting objects), dynamic abdominal exercises and twisting movements of the spine. Yoga or Pilates postures should be avoided or modified [4].</td>
<td>Recommendations based on high level 1 evidence.</td>
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| The National Institute for Health and Care Excellence (NICE) 2014 guidance on the osteoarthritis care and management of adults. | Moderate                 | This guideline recommends that people with osteoarthritis exercise as a core treatment, irrespective of age, comorbidity, pain severity or disability, outlining that exercise should include local muscle strengthening and general aerobic fitness [3]. Relevant recommendations: 1.2.5 Offer advice on the following core treatments to all people with clinical osteoarthritis. • Access to appropriate information (see recommendation 1.3.1). • Activity and exercise (see recommendation 1.4.1). 1.3.1 Offer accurate verbal and written information to all people with osteoarthritis to | There was no clear link between evidence and recommendations only the following blanket statement was provided” “Many of the included RCTs on land-based, hydrotherapy and manual therapy categories had the following methodological characteristics: • Single-blinded or un-blinded • Randomisation and blinding were
Guideline | Quality of the Guideline | Practice Recommendation | Quality of evidence-base
---|---|---|---
 |  | enhance understanding of the condition and its management, and to counter misconceptions, such as that it inevitably progresses and cannot be treated. Ensure that information sharing is an ongoing, integral part of the management plan rather than a single event at time of presentation. 
1.4.1 Advise people with osteoarthritis to exercise as a core treatment (see recommendation 1.2.5), irrespective of age, comorbidity, pain severity or disability. Exercise should include:  
• local muscle strengthening and  
• general aerobic fitness. | flawed or inadequately described  
• Did not include power calculations, had small sample sizes or had no ITT analysis details”

**Conclusion**

In conclusion, the evidence-base recommends site specific exercise for osteoarthritis [1-4]. Multimodal exercises including regular, high-intensity resistance, balance, strength and mobility are all recommended for treatment and management of osteoarthritis and improving bone mineral density as well as slowing bone loss [1-4]. The evidence warns against high-impact training [1] and spinal flexion and twisting exercises for people who have demonstrated an increased risk of vertebral fractures [2-4]. As with any exercise program they should be tailored to the individual and may require supervision [1].

**References**


https://www.icsi.org/_asset/vnw0c3/Osteo.pdf

https://www.nice.org.uk/guidance/cg177/chapter/1-Recommendations#non-pharmacological-management-2