

CASE REPORT

Hip osteoarthritis: patients with complex comorbidities can make exceptional improvements following intensive exercise and education

Thomas William Wainwright,^{1,2} Tikki Immins,³ Robert Gordon Middleton²

¹Department of Orthopaedic, The Royal Bournemouth Hospital, Bournemouth, Dorset, UK

²CoPMRE, Bournemouth University, Bournemouth, Dorset, UK

³Bournemouth University, Bournemouth, Dorset, UK

Correspondence to

Thomas William Wainwright, twainwright@gmail.com

Accepted 26 January 2015

SUMMARY

A 71-year-old man presenting with hip osteoarthritis, with a complex range of comorbidities was referred by his general practitioner to CHAIN (Cycling against Hip PAIN), a 6 week programme developed to aid self-management of hip osteoarthritis through exercise, education and advice, as defined by the National Institute for Health and Care Excellence (NICE) guidelines. Significant improvements were seen in Oxford hip score, the Hip disability and Osteoarthritis Outcome Score (HOOS) – function score, sit-to-stand test, timed up and go test, pain scores and hip flexion. There was also a weight loss of 2.1 kg. The man reported ‘an amazing difference’ in his affected hip and leg, and improved fitness. Many clinicians would have questioned the man’s suitability for the programme due to his coexisting medical conditions. This case study shows that patients may be much more able than we think to achieve significant improvement with exercise.

type 2 diabetes. In addition he had frequent gallstones; mild asthma and bronchitis. He had also damaged the cartilage in his right knee in his twenties, and subsequent surgery had damaged his knee ligament.

Prior to starting the CHAIN programme, measurements were taken of the man’s Oxford hip score, the Hip disability and Osteoarthritis Outcome Score (HOOS) – function score weight, pain at rest and weight bearing (using a 0–10 visual analogue scale), sit-to-stand test (time taken to sit-to-stand five times), timed up and go test (time taken to rise from chair, walk 3 m, turn, return to sitting on chair), peak expiratory flow, and degree of flexion in the hip. The man defined that his personal goals for the programme were to strengthen his right leg, and be able to use it more; improve his physiological welfare and fitness; and use his walking stick less.

BACKGROUND

Osteoarthritis affects a third of people in the UK aged 45 years and over,¹ and 8% will be affected by hip arthritis, the most common reason for a total hip replacement. These figures are forecast to nearly double by 2035 owing to an ageing population and a rise in obesity levels.

The National Institute for Health and Care Excellence (NICE) guidelines for osteoarthritis recommend three core treatments for patients presenting with osteoarthritis in primary care: education and advice, aerobic and muscle strengthening exercises, and weight loss if appropriate.² However, there is no specific guidance on what form the exercise should take, or how it should be delivered. The Cochrane Collaboration’s Review of Exercise for Osteoarthritis of the Hip concludes that there is a high level of evidence that land-based exercise does reduce pain and improve physical function for patients, but calls for further research on optimal exercise content and dosage.³

INVESTIGATIONS

Osteoarthritis was confirmed by X-ray in February 2014.

TREATMENT

The man took part in CHAIN, a programme conceived by a consultant orthopaedic surgeon and a physiotherapist as a way of implementing NICE recommendations within a community setting. It is a 6 weeks programme consisting of a weekly 1 h group session at a local leisure centre comprising 30 min education and advice and 30 min static cycling, along with a home based cycling and exercise programme.

The education sessions include information on cycling technique, the benefits of exercise for osteoarthritis, diet and pain relief (table 1). The difficulty of the static cycling sessions is graduated with the final week being equivalent to a public static cycling session. There were 10 people in the group undertaking the programme.

The man was enthusiastic in the education component of the programme, regularly voicing his experiences, opinions and contributing to group discussions. Owing to his ankylosing spondylitis, he required initial additional input during the exercise class on adaptive postures and optimal positioning on the bike. Additionally, his respiratory history required time to be dedicated to developing breathing control techniques and strategies to enable self-management of his exertion-induced shortness

CASE PRESENTATION

A 71-years-old man diagnosed with hip osteoarthritis was referred by his general practitioner to CHAIN (Cycling against Hip PAIN), a hip osteoarthritis self-management programme. He had suffered from ankylosing spondylitis affecting his neck and lower spine for 50 years, and had also had a subtotal colectomy as a result of Crohn’s disease. He had had hypertension for over 10 years and



CrossMark

To cite: Wainwright TW, Immins T, Middleton RG. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-208529

Table 1 CHAIN programme overview

Week	Assessment	Group education system (30 min)	Group static cycling session (progresses in difficulty)	HEP
Preprogramme	Personal goal setting and baseline measures			
1		Introduction to CHAIN programme Cycling/pedaling technique Home exercise programme explained	Week 1 30 min	Daily HEP 2×30 min cycling per week
2		Introduction to OA and the hip joint The benefits of exercise for OA—part 1	Week 2 30 min	Daily HEP 2×30 min cycling per week
3		The benefits of exercise for OA—part 2 How to optimise pain relief	Week 3 30 min	Daily HEP 2×30 min cycling per week
4		Advice on diet, nutrition and supplements What the research says about complementary therapies and assistive devices	Week 4 30 min	Daily HEP 2×30 min cycling per week
5		Ideas for suitable alternative exercise options Bike maintenance advice Postprogramme exercise planning	Week 5 30 min	Daily HEP 2×30 min cycling per week
6		Next steps Links to support networks and social events	Week 6 30 min	Daily HEP 2×30 min cycling per week
Postprogramme	Reassessment of goals and baseline measures			Daily HEP 3×30 min cycling per week

CHAIN, Cycling against Hip PAIN; HEP, home exercise programme; OA, osteoarthritis.

of breath. Both of these concepts fitted seamlessly into the educational and exercise ethos of pacing.

OUTCOME AND FOLLOW-UP

The patient, although presenting with complex comorbidities, benefitted greatly from taking part in the CHAIN programme, and his significant progress made throughout the programme had a positive impact on the rest of the group.

Improvements were seen in the Oxford hip score, HOOS function score, sit-to-stand test, timed up and go test, pain scores and hip flexion. There was also a weight loss (table 2).

The man reported an ‘amazing difference’ in the improvement in the strength and use of his right leg. He also reported an improvement in his physiological welfare and fitness as he was able to cope better in the heat, and needed to rest less. However, he was not able to use his walking stick less owing to existing numbness in his feet and lower limbs.

Table 2 Changes in outcome scores following the CHAIN programme

	Before	After	Change
Oxford hip score	16	21	5
EQ5D VAS	80	65	-15
HOOS (function)	13.2	44.1	39.9
Sit-to-stand (s)	18.1	16.6	1.5
Timed up and go (s)	36.5	10.9	25.6
Pain at rest	3.3	2.3	-1.0
Pain weight bearing	3.8	2.0	-1.8
Flexion (degrees)	80	95	15
Weight (kg)	87.8	85.7	-2.1

CHAIN, Cycling against Hip PAIN; HOOS, Hip disability and Osteoarthritis Outcome Score; VAS, visual analogue scale.

Six weeks after the programme the man was cycling around town for at least 15 min a day, and he continues to cycle and walk his dogs as he finds this helps with the hip pain.

DISCUSSION

It is estimated that osteoarthritis has between 68% and 85% comorbidity rates.⁴ At present there are no protocols or guidelines on how the NICE recommendations can be adapted for comorbidity, although studies have found that coexisting disorders such as cardiac disease, hypertension, type 2 diabetes, chronic obstructive pulmonary disease, chronic back pain, chronic rheumatic diseases may restrict the ability to exercise.^{4 5}

Patient’s perspective

- ▶ The programme made me realise that exercise was the best way to improve my pain and the use of my leg. It has made such a difference to me. I can now turn over in bed at night without having pain. I am determined to keep up with the exercise. Sometimes I don’t want to go out and walk the dogs, but once I am halfway through my walk I realise that I am walking more easily.
- ▶ I think it is important that you stick with the programme and the exercise. It is tough the first couple of sessions, but you need to see it through to get the benefits, and to acquire the knowledge and advice that will help. It is also really positive that it is done in a local leisure centre. I never realised how much support was on offer at these places, and the enthusiasm for exercise at the centre was really infectious.

Conversely, however, exercise is accepted as a beneficial intervention for these disorders and others when evaluated independently.

Learning points

- ▶ Eight per cent of the UK population are affected by osteoarthritis of the hip, and this is set to increase in the future.
- ▶ The National Institute for Health and Care Excellence (NICE) guidelines for osteoarthritis recommend three core treatments for patients presenting with osteoarthritis in primary care: education and advice, aerobic and muscle strengthening exercises, and weight loss if appropriate. However, there is no specific guidance on what types of exercise should be used, their intensity, or how they should be delivered.
- ▶ Standard practice for patients reporting hip stiffness to their general practitioner can be varied and inconsistent as there is no uniform pathway of treatment.
- ▶ Exercise benefits patients with osteoarthritis and complex comorbidities. Importantly, the exercise will likely benefit both the primary problem (osteoarthritis) and the coexisting morbidities.
- ▶ Health professionals should not restrict exercise therapy to young and active patients.

The outcomes of this case study suggest that patients with hip osteoarthritis and complex morbidity are able to exercise at higher levels than many health professionals would think, as long as they are assessed and supervised appropriately. However, more research is needed to aid decision-making on the most appropriate types and intensity of exercise for these patients.

Twitter Follow Thomas Wainwright at @twainwright

Acknowledgements The authors acknowledge Kate Rogers, Group Health and Fitness Manager at BH Live and Daniel Elliot, Senior Physiotherapist at the Royal Bournemouth Hospital. They also acknowledge the CHAIN Partnership.

Contributors TWW and RGM conceived the CHAIN programme. TWW initiated the case study and TI and RGM helped with implementation. TI provided statistical expertise and analysis. All authors contributed to writing and refinement of the case study and approved the final manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Arthritis Research UK. *Osteoarthritis in general practice. Data and perspectives*. Chesterfield: Arthritis Research UK, 2013.
- 2 National Institute for Health and Care Excellence (NICE). *Osteoarthritis. Care and management in adults*. NICE Clinical Guideline 177. <http://www.nice.org.uk/guidance/CG177> (accessed 26 Jun 2014).
- 3 Fransen M, McConnell S, Hernandez-Molina G, *et al*. Exercise for osteoarthritis of the hip. *Cochrane Database Syst Rev* 2014;4:CD007912.
- 4 De Rooij P, Steultjens M, Avezaat E, *et al*. Restrictions and contraindications for exercise therapy in patients with hip and knee osteoarthritis and comorbidity. *Phys Ther Rev* 2013;18:101–11.
- 5 Reeuwijk K, de Rooij M, van Dijk GM, *et al*. Osteoarthritis of the hip or knee: which co-existing disorders are disabling? *Clin Rheumatol* 2010;29:739–47.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow