A cycling and education programme to promote self-management and to increase functional ability in patients with osteoarthritis of the hip

Purpose

To evaluate a cycling and education programme as a treatment intervention to improve functional outcome measures for patients with osteoarthritis of the hip.

Methods

The CHAIN (Cycling against Hip Pain) programme was developed to aid self-management of hip osteoarthritis through exercise, education and advice, in line with UK National Institute for Health and Care Excellence (NICE) guidelines. The intervention is over a 6 week period. Participants attend a local leisure centre for an hour a week and have a 30-minute education session followed by 30 minutes static cycling. They are encouraged to cycle on at least two other occasions each week for 30 minutes. Education topics include advice detailed within NICE guidelines on diet, alternative therapies, surgical options, analgesia, and the benefits of exercise. The static cycling intensity is graduated over the weeks from beginner level to the final session, which is equivalent to a standard static cycling class. A senior physiotherapist delivers the education session and a trained static cycling instructor takes the static cycling class. During the cycling sessions participants are taught pedalling technique, and are encouraged to cycle with a higher cadence and a medium level of resistance.

Participants are assessed pre and post the programme, and this includes an exercise tolerance test along with functional outcome measures and personalised goal setting.

When 58 people had entered the programme the service was evaluated, and it was noted that there was a significant change in the pre and post assessment for the Sit-to-stand test (mean change 3.07s (95% CI 1.99 to 4.14), $p \leq 0.001$) This test assesses lower-extremity strength and is the time taken to stand up and sit down 5 times as quickly as possible. There were also improvements to the Oxford Hip Score ($p \leq 0.001$) and EQ5D Visual Analogue Score ($p \leq 0.001$).

Following the evaluation, it was decided to introduce further functional assessments: Timed Up and Go Test (TUG) (time to rise from a chair, walk 3m, turn, return to chair and sit down), and Hip Disability Osteoarthritis Outcome Score (HOOS) function subscale. The TUG was chosen to see if improved cycling performance carried over to walking ability, and the HOOS was chosen because of its improved sensitivity over the Oxford hip score for evaluating change.

Results

25 participants completed the CHAIN programme after the change in outcome measures and the pre and post assessments included sit-to-stand scores, TUG tests and HOOS function scores and Oxford Hip Score. The mean age was 62 (range 39 to 80), mean BMI was 29 (Range 23 – 41) and the mean initial Oxford Hip Score was 32 (range 16 – 42).

Table 1 details the changes in the assessments, and gives the percentages of participants whose assessment improved, stayed the same, or worsened (shown in Figure 1).

Table 1: Changes in outcomes following CHAIN

Outcome	n	Mean pre score (SD)	Mean post score (SD)	Health Gain	Improved %	Same %	Worse %
Sit-to-stand	24	14.8(4.4)	11.8(2.6)	3.0	75	0	25
Timed Up and Go	24	10.7(6.2)	7.6(1.9)	3.1	88	4	8
HOOS function	25	63.4(20.4)	74.6(18.8)	11.2	92	4	4
Oxford Hip Score	25	32.3(7.6)	36.0(8.0)	3.7	84	4	12

Conclusions

In this service evaluation, a 6 week cycling and education programme successfully improved strength and functional ability for the majority of patients with hip osteoarthritis. The positive changes in functional assessments for participants in the CHAIN programme may be explained by the repetitive active and passive mobilisation of the hip joint, and high volume of repetitions experienced when cycling. These offer a higher dosage of range of motion exercises than that usually offered by physiotherapists in routine clinical practice. Research has shown that static cycling exercise can aid pain relief for patients with knee osteoarthritis. Further research is needed on the benefits of cycling for patients with hip osteoarthritis.

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Figure 1: % of Participants with Improved Outcomes following CHAIN