

Manual physical therapy and exercise improved function in osteoarthritis of the knee

Deyle GD, Henderson NE, Matekel RL, et al. Effectiveness of manual physical therapy and exercise in osteoarthritis of the knee. A randomized, controlled trial. *Ann Intern Med.* 2000 Feb 1;132:173-81.

QUESTION

In patients with osteoarthritis of the knee, how effective is manual physical therapy and exercise in decreasing pain and stiffness and increasing function and walking distance?

DESIGN

Randomized (allocation concealed*), blinded (outcome assessor),* controlled trial with 1-year follow-up.

SETTING

Outpatient clinic of a U.S. army medical center in Fort Sam Houston, Texas.

PATIENTS

83 patients (mean age 61 y, 59% women) who had osteoarthritis of the knee, no surgical procedure on either lower limb in the previous 6 months, and no physical impairment that would preclude study participation. 69 patients (83%) completed the treatment.

INTERVENTION

Patients were allocated to manual physical therapy and exercise ($n = 42$) or placebo (ultrasonography at a subtherapeutic intensity) ($n = 41$) given twice weekly for 4 weeks. Physical therapy consisted of passive joint movements; muscle stretching; and soft-tissue mobilization applied to the knee

and to the lumbar spine, hip, or ankle if necessary. The exercise program involved stretching routines for the lower limbs; range-of-motion exercises for the knee, including stationary cycling; and muscle-strengthening exercises for the hip and knee. Intervention-group patients also did the exercises at home, 30 min/d.

MAIN OUTCOME MEASURES

Change in stiffness, pain, and function subscores on the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) (visual analog scale version) and the distance covered during a 6-minute walk test.

MAIN RESULTS

At 8 weeks, mean WOMAC scores decreased more in the intervention group than in the placebo group ($P < 0.05$) (Table).

Intervention-group patients increased their 6-minute walking distance more than did placebo-group patients ($P < 0.05$) (Table). At 1 year, fewer intervention-group patients had knee surgery than did placebo-group patients ($P = 0.039$) (Table).

CONCLUSION

In patients with osteoarthritis of the knee, manual physical therapy and exercise decreased pain and stiffness and increased function and the distance walked in 6 minutes.

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*See Glossary.

Physical therapy (PT) and exercise (Ex) vs placebo for osteoarthritis of the knee†

Outcomes at 8 wk	PT + Ex (baseline)	Placebo (baseline)	Difference in mean change from baseline (95% CI)	
Mean WOMAC score (mm)	462 (1047)	934 (1094)	425 (189 to 661)	
Mean 6-min walking distance (m)	487 (431)	410 (403)	49 (19 to 79)	
Outcome at 1 y			RRR (CI)	NNT (CI)
Knee surgery	5%	20%	76% (6 to 94)	7 (4 to 134)

†WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index. Other abbreviations defined in Glossary; RRR, NNT, and CI calculated from data provided by author.

COMMENTARY

Deyle and colleagues conducted a well-designed, assessor-masked, randomized, clinical trial of the efficacy of manual therapy and exercise on U.S. army personnel with osteoarthritis of the knee. Army personnel are probably representative of the general population and possibly more disciplined and compliant.

The trial is remarkable because favorable outcomes were achieved in 4 weeks and maintained at 8 weeks using noninvasive interventions. Furthermore, 50% of patients assessed at 1 year maintained their benefits, albeit at a slightly reduced rate.

In scrutinizing the study methods, it is notable that neither the sample size nor the anticipated dropout rate was justified in the text. It was not clear which of the 2 main outcomes reported was considered primary in testing the study hypothesis. Because of the unbalanced dropout rate, the use of a multiple imputation analysis to account for missing data might have been helpful. Any loss of

outcome data regardless of how it occurs clearly reduces the statistical precision of a trial and may also introduce bias if the losses vary by treatment group (1).

This trial showed that control patients had statistically significant higher rates of surgeries and intra-articular steroid injections at 1 year. On the basis of this finding, physicians treating patients with osteoarthritis might improve pharmacologic management by referring patients earlier rather than later to physical therapists. This small change could diminish the burden of disability and reduce the presumably higher cost of invasive surgery and postsurgical rehabilitation.

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Reference

1. Rubin DB. Multiple Imputation of Nonresponse in Surveys. New York: John Wiley; 1997.