Evidence Supports Supervised Physical Therapy Programs After TKA

To the Editor:

As a physical therapist and clinical researcher, I read the article “Comparing Conventional Physical Therapy With Neuromuscular Electrical Stimulation After TKA” by Levine et al1 in the March 2013 issue of ORTHOPEDICS with great interest. With the rise in TKA use2 and shift to a younger patient demographic,3 studies that identify low-cost, effective strategies to optimize function after surgery are of high importance. Unfortunately, several important limitations preclude drawing clinically relevant conclusions from the article by Levine et al.1 Important details describing both interventions (ie, physical therapy and neuromuscular electrical stimulation) were absent, and both groups appeared to be under-rehabilitated 6 months after TKA.

Appropriate description of study parameters and intervention protocols are essential to any research article. Explicit description of the methodology does the following: (1) allows additional researchers to repeat and substantiate the findings in larger independent trials with investigators who are not associated with the products used in the intervention and (2) permits the implementation of the optimal or superior intervention into clinical practice. In this article, the authors provided no description of the specific exercises performed in the physical therapy group, and details pertaining to the rate of exercise progression, the duration of treatment, and the number of sessions attended were not included. Similarly, no information was provided on the dose, duration, or frequency of use of neuromuscular electrical stimulation in the comparative group. Given the dose-dependent strength gains in response to neuromuscular electrical stimulation in patients after TKA,4 quantification of the compliance and dose is essential in a comparative effectiveness study including this modality. The lack of information in this study makes it impossible to draw logical conclusions from the results and prohibits integrating either rehabilitation protocol into clinical practice.

Recent research studies have demonstrated that physical therapy protocols that start early after TKA,5 include standardized progressive strengthening exercises,6 or incorporate high-intensity exercises for multiple lower-extremity muscles7 produce functional outcomes that surpass conventional physical therapy protocols. In light of this evidence, these optimal physical therapy protocols should be used as the comparative group in any research study. Evidence-based physical therapy protocols after TKA do not merely consist of supervised exercise programs, but should include the following: (1) supervised progressive lower-extremity strengthening exercises with defined milestones for progression, (2) manual therapy to improve range of motion, and (3) modalities to reduce pain and swelling. In the study by Levine et al,1 both groups demonstrated knee flexion contractures (2.58° and 3.54°) and relatively long get-up-and-go times (10.64 and 10.25 seconds) 6 months after TKA. This may be attributable to the nature of the interventions, given that rehabilitation protocols that include high-intensity and progressive strengthening or started early after TKA produced notably better outcomes 6 months after surgery (knee extension: −1.9° to −0.5° [hyperextension]; get-up-and-go: 6.6-7.1 seconds)5,7 than those reported in this study.

Interventions that reduce the cost of care for the ever-growing number of individuals electing to undergo TKA will be essential to reducing the socioeconomic burden of this procedure. The authors suggest that unsupervised, at-home exercises using neuromuscular electrical stimulation may be a cost-effective way to manage postoperative rehabilitation. It should be noted that physical therapy is low cost. Total medical costs in the year following TKA are upwards of $87,000.11 Physical therapy costs of $1200 as suggested by the authors, or $1514 as reported by Graver et al,11 comprise a small slice of the medical costs associated with TKA (1.4%-1.7%). Outpatient care costs are lower the year following TKA than the year preceding TKA.12 The argument could be made that supervised physical therapy programs after TKA may have a long-term cost-saving benefits through the promotion of an active lifestyle and early identification of red-flag signs or symptoms; however, systematic cost-effectiveness analyses are required before conclusions can be made.
Only when the best clinical physical therapy practice is compared with nonsupervised treatments can conclusions about the effectiveness of nonphysical therapy regimens be discussed. This is not a trivial consideration. Peer-reviewed and published articles are used to make decisions about clinical practice, reimbursement, and plans of care. We need to do better as rehabilitation and medical communities to ensure the details of our work are appropriate and the conclusions reflect the actual methods of the study. A pharmaceutical trial would not make it to the peer-review process in the absence of information pertaining to the dose, duration, or method of administration. The same standard needs to be adhered to for all areas of health care research.

REFERENCES


Reply:

I appreciate Dr Zeni’s interest in the article “Comparing Conventional Physical Therapy with Neuromuscular Electrical Stimulation after TKA.” I would like to respond to several of his comments. One of his major concerns was the lack of appropriate description of the physical therapy and neuromuscular electrical stimulation protocols. Because of the length of each of these protocols, they were intentionally withheld from the article to maintain a reasonably sized document. Detailed descriptions are available from the primary author (M.L.).

It is critical to understand that the purpose of this study was to look at a specific question: would a 6-week program of range of motion (ROM) exercises along with a well-constructed neuromuscular electrical stimulation protocol provide similar ROM and functional results to that of a formal monitored physical therapy program? At no time was the intention to look at the length of rehabilitation or to discredit the need for physical therapy. The coinvestigators (V.S., K.M., J.C.) were physical therapists.

I will not embellish this response with literature regarding persistent flexion contractures noted or hands-on manual therapy for ROM. However, it is well noted in the orthopedic community that flexion contractures usually disappear by the end of the first year. Based on extensive clinical experience, I have also asked physical therapists caring for my patients to avoid manual therapy for ROM because this often results in a significant increase in postoperative pain and decline in ROM.

Finally, Dr Zeni points to the cost analysis. Based on his recommendation of 6 months of physical therapy, the cost would increase to over $5000. In the economic environment that most of us practice in today, many of our patients are required to pay significant copays for each physical therapy visit. In addition, most insurers limit the number of physical therapy visits per condition per year. I agree that unlimited physical therapy visits would provide the best results in the ideal world, but this is unfortunately not possible in 2013.

I reiterate that the sole purpose of this study was to address the specific question above. There are many cogs in the wheel for a successful result after total knee arthroplasty, and physical therapy is definitely a critical contributor. I want to make it perfectly clear that it was not the intention of the authors to trivialize the role of physical therapy in total knee arthroplasty recovery.

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