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Using Solid Evidence to Treat the Feet

Treating the feet of our older patients is important from the aspect of both specific problems, such as hallux valgus, to the bigger picture of how the feet contribute to the full functioning of the body, such as a person's balance. Menz in 2006 identified foot and ankle factors that contribute to falls in older people. These are decreased ankle dorsiflexion range of motion (ROM), the more severe hallux valgus, decreased plantar tactile sensitivity and decreased plantarflexion strength.[1]

This article will explore these attributes as they contribute to falls in our patients, as well as specific evidence-based treatments for each of these specific foot problems.

Ankle Dorsiflexion

Mecagni found that a correlation exists between ankle ROM and balance. If an older person has less than 8 degrees of dorsiflexion with knee extended and less than 10 degrees with knee flexed, he is at an increased risk of falling.[2] This noted impairment must be measured and treated, and the evidence-based treatment approach is apparent from the study by Johnson.[3] In this study, Johnson showed an increase of 12.3 degrees after six weeks with the program supervised by PT of standing calf stretches five days a week for six weeks, with the stretch held 60 seconds and repeated four times.

Hallux Valgus

Muscle imbalance in the great toe abductor and adductor muscles in patients with hallux valgus is apparent and may be the reason for the joint deformity. This is the premise of the article written by Arinici.[4] This study directs therapists to work on improving the balance disequilibrium in the toe abductor and abductor muscles to create a more normal functioning foot. Good intrinsic muscle strengthening exercises such as towel curls and toe spreads are prime examples of such exercises. Shamus gave a specific protocol to help loosen the rigidity associated with a tight Hallux.[5]

All patients received whirlpool and ultrasound to the foot and mobilizations to the first MP joint. Patients also performed calf and hamstring stretches, as well as marble pick-up exercises. In addition, they received sesmoid mobilization and flexor hallucis and plantarflexion strengthening.

If a patient has had surgery, there is an excellent study that discusses rehabilitation after hallux valgus surgery.[6] Schuhin showed that postoperative PT and gait training may lead to improved function after surgery.

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Finally, dynamic splinting for hallux valgus was shown to be effective by John. In this study, patients wore a Dynasplint for three months. Patients started with 10 minutes and built up to one hour, increasing tension every two weeks. Patients regained 10 degrees active motion at the end of the trial.[7]

Plantar Tactile Sensitivity

The third area on Menz's list is plantar tactile sensitivity. The hallmark study in this area is by Caputo.[8] In this article the author concludes that all patients with diabetes should be assessed with a nylon monofilament (pressed against the skin to the point of buckling) to identify patients who have lost protective sensation. This is such an easy and important test that the federal government provides both patients and health professionals with free monofilaments.

Once the area is assessed, therapists can work on evidence-based treatments. Two evidence-based studies come to mind to help patients improve in this area. First is a study by Kobayashi that showed that the toe grasp training group improved significantly in balance. It was believed that this was due to improvements in foot mechanoreceptors and eye-leg coordination.[9]

Waddington also did a great home exercise program (HEP) that improved sensory and proprioception.[10] This was a five-week training that was done five times a day. The HEP had participants train on a wobble board in a doorway for three minutes and work on balance wearing preferred footwear.

Decreased Plantarflexion

The final area of Menz's work is decreased plantarflexion strength. Beginning with measurement, we must recognize that this is a controversial area. Even in basic manual muscle test books there is disagreement as to what is a 5/5. We prefer Daniels and Worthingham's interpretation, which states that five times up on the one-legged plantarflexion heel raise is a 5/5, 4/5 is one time up, 3/5 is partially up and so on.[11]

Once the muscle has been measured, Hartman's study on foot gymnastics showed significant improvements in power, walking speed and step length with a 2x/week program that was conducted for 12 weeks.[12] If patients are not strong enough for foot gymnastics, then a vibrating platform may help increase the strength gains.[13]

Rees' study looked at using a vibrating platform as an adjunct to a typical strength program in older persons and showed vibration training increases plantarflexion power more than just progressive resistive exercise (PRE). The program was conducted for four weeks, three times a week and consisted of squats and calf raises to fatigue.

With a dual approach and using good evidence-based treatment, we can work on our patients' specific foot and function problems. ■

References are available at www.advanceweb.com/pt or by request.

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