Interventions for congenital talipes equinovarus (clubfoot)

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In the current issue of the *Journal*, we asked Dr W Gary Smith to comment on and put into context the recent Cochrane Review on interventions for congenital talipes equinovarus (clubfoot).

Background

Congenital talipes equinovarus (CTEV), which is also known as clubfoot, is a common congenital orthopedic condition characterised by an excessively turned in foot (equinovarus) and high medial longitudinal arch (cavus). If left untreated, it can result in long-term disability, deformity and pain. Interventions can be conservative (such as splinting or stretching) or surgical. The review was first published in 2012 and we reviewed new searches in 2013 (update published in 2014).

Results

Fourteen trials involving a total of 607 participants were identified; one of the trials was newly included in this 2014 update. The use of different outcome measures prevented pooling of data for meta-analysis, even when interventions and participants were comparable. All trials displayed bias in four or more areas. One trial reported on the primary outcome of function, although raw data were not available to be analyzed. From three trials, data regarding foot alignment (Pirani score), a secondary outcome, were analyzed. Two of the trials involved participants at initial presentation. One reported that the Ponseti technique significantly improved foot alignment compared with the Kite technique. After 10 weeks of serial casting, the average total Pirani score of the Ponseti group was 1.15 (95% CI 0.98 to 1.32), which was lower than that of the Kite group. The second trial found the Ponseti technique to be superior to traditional technique with average total Pirani scores of Ponseti participants being 1.50 lower (95% CI 0.72 to 2.28) after serial casting and Achilles tenotomy. A trial in which the type of presentation was not reported found no difference between an accelerated or standard Ponseti treatment. At the end of serial casting, the average total Pirani scores in the standard group were 0.31 lower (95% CI −0.40 to 1.02) than the accelerated group. Two trials in initial cases found relapse following Ponseti treatment was more likely to be corrected with further serial casting compared with the Kite groups, which more often required major surgery (risk difference 25% and 50%). There is a lack of evidence for different plaster casting products, the addition of botulinum toxin A during the Ponseti technique, different types of major foot surgery, continuous passive motion treatment following major foot surgery, or treatment of relapsed or neglected cases of CTEV. Most trials did not report adverse events. In trials evaluating serial casting techniques, adverse events included cast slippage (needing replacement), plaster sores (pressure areas) and skin irritation. Adverse events following surgical procedures included infection and the need for skin grafting.

Conclusions

From the limited evidence available, the Ponseti technique produced significantly better short-term foot alignment compared with the Kite technique and to a traditional technique. The quality of this evidence was low to very low. An accelerated Ponseti technique may be as effective as a standard technique, according to moderate quality evidence. Relapse following the Kite technique more often led to major surgery compared with relapse following the Ponseti technique. We could draw no conclusions from other included trials because of the limited use of validated outcome measures and lack of available raw data. Future randomised controlled trials should address these issues.

The full text of the Cochrane Review is available in *The Cochrane Library*: Gray K, Pacey V, Gibbons P, Little D, Burns J. Interventions for congenital talipes equinovarus (clubfoot). Cochrane Database of Systematic Reviews 2014, Issue 8. Art. No.: CD008602. DOI: 10.1002/14651858.CD008602.pub3.

EXPERT COMMENTARY

CTEV is a common congenital orthopedic abnormality presenting in the newborn period at a rate of one to two per 1000 newborns (1).

For most family physicians and paediatricians, the treatment of moderate to severe clubfoot remains firmly in the hands of paediatric orthopedic surgeons. However, knowledge of the options available to parents is an important tool in assisting parents and patients. The review discusses the conservative nonsurgical techniques that are available.

The review indicates that few studies investigated the most important outcome of long-term functionality and concentrated instead on short-term foot alignment (Pirani score). Although the Ponseti serial casting and splint method appears to be more effective than the older Kite method, the data quality is described as low to very low.

The Ponseti technique involves six to eight weeks of a long leg plaster cast with cast changes once per week, followed in almost all cases by a percutaneous Achilles tenotomy. A boot and bar brace is then worn for up to four years, primarily at night. The Kite technique requires casting for up to two years; however, 50% to 75% ultimately require major surgical intervention for a recurrence.

Unfortunately, relapses are common with all techniques and may occur in up to 47% before four years (2). Two Canadian case studies not included in the Cochrane review from one institution indicated that the recurrence rate with the Ponseti method ranged from 14% to 30% (3,4). As one may expect, noncompliance with the bracing is a common cause of relapse. Long-term observational studies in patients treated for relapse following treatment with the Ponseti method have found poorer outcomes for patients treated with major foot surgery, so many use the same nonoperative approach that was used initially for those patients (1).

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The French functional method, which involves daily physiotherapy and splintage with a specialized physiotherapist, has been reported to result in good to very good outcomes in 98% of feet in those with mild to moderate CTEV. Some have conjectured that a 'hybrid method' that uses both Ponseti and the functional method may be the way of the future. Given the difficulty with ensuring daily physiotherapy with a specialized physiotherapist, one author indicated that "Health Economics" may prove decisive in the choice of therapy (5-8). Only a few centres in North America use the French functional method.

Although CTEV with forefoot adductus, varus alignment, high medial arch and shortened Achilles tendon is in the scope of paediatric orthopaedic surgeons, the more common condition of forefoot adductus can be managed by family physicians and paediatricians (9). Although mild forefoot adductus may improve on its own, moderate and severe forefoot adductus should be treated. Conservative measures, such as parental stretching and serial casting, can be used. When these measures fail, orthotics, such as the Wheaton's splint, have been very effective in treating this deformity and are easily available to practitioners (10). Clinicians should keep in mind the increased rates of other musculoskeletal problems, such as torticollis and hip dysplasia, in children with forefoot adductus.

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