

CAHE JC Critically Appraised Article Summary

Journal Club Details

Date of submission	November 2007
Journal Club location	Lyell McEwin Hospital
JC Facilitator	Matt Sutton

Clinical Scenario

Serial casting to treat children who toe-walk

Review Question/PICO/PACO

'Does serial casting improve gait in toe-walkers?'

- P** Children aged 3-10; toe-walkers/tight calves
- I** Serial casting
- C** Stretches/surgery/activity levels/other
- O** Gait, function/participation

Article/Paper

Fox A, Deakin S, Pettigrew G, Paton R 2006, 'Serial casting in the treatment of idiopathic toe-walkers and review of the literature', *Acta Orthopaedica Belgica*, 72(6), 722-730
< <http://www.actaorthopaedica.be/acta/download/2006-6/10-Fox.pdf> >

Article Methodology:

(Prospective) case-series; pre-post

*NB: Article has been appraised using cohort study tool in the absence of a suitable CASP appraisal tool. Minor modifications have been made to the wording of some appraisal items, but have been noted

Returned JC on: 11 December 2007

By CAHE staff member: Mat Prior





University of South Australia

CAHE

Centre for Allied Health Evidence

a collaborating centre of



THE JOANNA BRIGGS INSTITUTE

Ques No.	Yes	Can't Tell	No	Comments
1		✓		The authors state that "This study was set up as a prospective research project to determine the demographics and clinical presentation of toe-walkers..." (p.722) at an orthopaedic clinic. Whilst this appears a satisfactory question, the study also focuses on clinical outcomes as a result of serial casting interventions, yet this is not addressed clearly in the aims.
2	✓			<p>A prospective case-series study (pre-post design) is considered an appropriate method to determine outcomes from treatment, in that it measures the change in status from the beginning to the end of the study.</p> <p>(However, it should be noted that these clinical outcomes were not clearly addressed in the aims – if the authors' goals were solely to determine the demographics and presentation of toe-walkers at an orthopaedic clinic, a one-off cross-sectional study may have been appropriate.)</p> <p>As treatment outcomes are of most interest for our purposes, other methods may have been more appropriate to address the issue. To determine whether serial casting is more effective than no intervention/alternate intervention, a well-designed randomised controlled trial, in which the children are randomly assigned serial casting or no/alternate treatment, may be seen as providing a more definitive answer.</p>
3	✓			All consecutively-presenting children aged over 2 years with idiopathic toe-walking [ITW] presenting to a specified paediatric orthopaedic clinic between December 1999 – September 2003 were invited to participate. Thus, the authors have attempted to recruit <i>all</i> subjects of interest that were known to them, rather than a random sample of them – it is considered that the subjects were representative of the target population.
4	✓			<p>(*Note: item 4 modified from 'Was the exposure accurately measured to minimise bias?' to 'Was the intervention described sufficiently?' 'Exposure' relates to risk factor studies, which this was not.)</p> <p>The intervention was well-described (Treatment protocol: p.723). All cases were reportedly treated in the same manner (serial casting changed fortnightly, followed by passive Achilles stretching exercises and 3-6 monthly clinical review).</p>



Ques No.	Yes	Can't Tell	No	Comments
5		✓		<p>The main outcomes assessed following the treatment protocol were toe-walking and ankle DF (Treatment protocol: p.723); however more measures were taken & recorded at the initial conversation.</p> <p>Standardised objective assessments of ankle DF were performed using goniometer measurement; however the follow-up assessment of 'toe-walking' is not clear – the initial measure was via parental estimation of time spent toe walking, whilst Table II (p.726 – 'Outcome following casting') implies that 'toe-walking' was assessed in terms of subjective improvement from initial measure, or simply the presence or absence of toe-walking according to parental observation. As such, it cannot be accurately determined whether measurement was accurate.</p> <p>At first presentation, in addition to subjective parental questioning and objective assessments (including neurological examination), parents were asked to complete the Gillette Score (details p.723). Whilst it has been validated in CP populations, the authors acknowledged it has not been validated for used in the ITW population.</p>
6			✓	<p>Limitations & potential confounders are not addressed in any great detail in this study. Many possible limitations potentially influence the results of this study and our interpretation of them. For example, there was no control/comparison group in this study, thus it can't be determined whether serial casting is as effective, or more effective than any other intervention (or no intervention). Also, the Gillette Score tool has not been validated for use within this population, whilst we are not told whether treatment (casting) was conducted by the same person (if not, were the therapists of similar experience?), nor do we know what compliance was like for ongoing stretching (with regard to long-term outcomes).</p>
7	✓			<p>Subjects (children) had follow-up reviews 3-months post-cast removal, then at 6 monthly intervals thereafter. Whilst the range of follow-up times is seemingly not reported, the mean follow-up period was 14 months, which would seem to be sufficient.</p>



Ques No.	Yes	Can't Tell	No	Comments
8				<p>Of the 44 children involved in this study, 68.2% (n=30) were male, whilst 34.1% had a family history of ITW. Only one complication was reported as a result of serial casting; that of plaster sores.</p> <p>66% (n=29) children "...either completely stopped toe-walking or improved sufficiently to satisfy their parents." However, we are not told how many of those 29 children satisfied each of those criteria; rather, treatment is labelled as 'successful' or 'unsuccessful'. The success of treatment varied amongst differing age groups.</p> <p>Ankle DF (in knee flexion) was significantly better in 'successfully treated' children vs. unsuccessfully treated children (p=0.001). However, ankle DF (in knee E) significantly improved in both groups, irrespective of walking outcome (p<0.01), thus it was concluded that "...[serial] casting does significantly improve ankle dorsiflexion, but it is the improvement in ankle dorsiflexion with the knee flexed that is important in clinical outcome."</p> <p>No demographic characteristic of the children was significantly associated with treatment outcome, however longer periods in casts trended towards significance (p=0.09).</p>
9				<p>Mean ankle DF ROM, with associated standard deviations, are reported; however improvements compared to baseline, and comparisons between groups, are only reported in terms of p value (not confidence intervals/effect sizes).</p>
10		✓		<p>In terms of determining the demographic information of a population of children with ITW, the study achieved its aims and its results are believable.</p> <p>However, for the purposes of determining the effectiveness of serial casting, the results are less clear. The results support claims of the benefit of serial casting in improving ankle DF, however the treatment was considered 'successful' in only 66% of cases, which should be considered. That outcomes were compared against 'successfully' and 'unsuccessfully' treated children would appear inappropriate; by definition of 'successful'/'unsuccessful' treatment you would expect to identify differences.</p>
11	✓			<p>The demographic information of the sample reports no information to suggest that a similar sample could not be obtained in other settings (eg. nothing special/unusual about this group of children studied), and thus the results seemingly can be applied to local populations.</p>
12	✓			<p>That male subjects were more common in a sample of ITW children is supported by existing literature (refer Discussion p.727). It is acknowledged that "the value of casting remains controversial" for treatment of ITW but that beneficial effects have been reported (p.728), which is consistent with the varying effectiveness (classification of successful/unsuccessful treatment) reported in this study.</p>