Effectiveness of primary conservative management for infants with obstetric brachial plexus palsy

Bialocerkowski A, Karlowicz K, Vladusci S, Grimmer K

CRD summary
This well-conducted and well-reported systematic review concluded that there was scant, inconclusive evidence on the effectiveness of primary conservative management for infants with obstetric brachial plexus palsy. Further research is needed to develop robust outcome measures, which should be applied in well-designed comparative studies. This conclusion is supported by the evidence presented.

Authors' objectives
To determine the effectiveness of primary conservative management for infants with obstetric brachial plexus palsy (OBPP).

Searching
MEDLINE (1992 to 2003), CINAHL (1992 to 2003), AMED (1992 to 2003), TRIP, Web of Science, ProQuest 5000, EBM Reviews, Expanded Academic ASAP, Meditext, Science Direct and PEDro were searched for studies published in the English language between 1992 and 2003. ProQuest Digital Dissertation Abstracts, Open Archives Initiative search engine and the Australian Digital Thesis Program were also searched for relevant theses. The full search strategy was reported. In addition, the reference lists of included studies were checked.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), pseudo-RCTs, comparative studies (cohort and case-control studies) and case series were eligible for inclusion.

Specific interventions included in the review
Studies of conservative management were eligible for inclusion. Conservative management was defined as the care and management of a patient to combat a disorder or injury, which avoids radical measures and procedures. Studies of primary surgery of the brachial plexus, management of secondary deformities, or pharmacological agents were excluded. In the included studies, conservative management consisted of the following: gentle regular exercise; passive range of motion development and strengthening exercise; active and passive movement; dynamic traction; home exercise programme; splints; or general occupational therapy, physiotherapy or conservative treatment. In studies that employed comparative groups, conservative management was compared with surgery. Most interventions were delivered by clinicians or surgeons in specialised paediatric units.

Participants included in the review
Studies of infants with a diagnosis of OBPP, diagnosed through clinical assessment or diagnostic imaging, and treated within the first 2 years of life were eligible for inclusion. In the included studies, infants were assessed within the first 3 months of life and the severity of OBPP varied.

Outcomes assessed in the review
Studies had to report recovery to be eligible for inclusion. This could be assessed through a variety of instruments and was expressed as a change in the magnitude of impairment or classified by rating scales that assess recovery in terms of attainment of normal function. A variety of outcome measures were used, of which the Mallet Scale and the British Medical Research Council's Muscle Movement Scale were the most frequently used instruments. Where reported, the timing of the outcome assessment ranged from 12 months to 5 years.

How were decisions on the relevance of primary studies made?
Two independent reviewers assessed the eligibility of studies. Any disagreements were resolved through discussion until
a consensus was reached.

**Assessment of study quality**
The methodological quality of the included studies was assessed using 12 criteria relating to internal and external validity. This included assessing the presence of bias in the outcome measure, intervention, analysis, clinical implications and conclusions. Each study was assigned a score out of 16. Two independent reviewers assessed the validity of the included studies.

**Data extraction**
Two independent reviewers extracted data from the included studies. Any discrepancies were resolved through discussion until a consensus was reached. Data were extracted on the main findings of each included study using a standardised template.

**Methods of synthesis**
How were the studies combined?
The studies were combined in a narrative, with evidence of effectiveness presented in terms of recovery and characteristics of infants who recover or fail to recover following conservative management.

How were differences between studies investigated?
The reviewers assessed clinical heterogeneity and differences between the studies were discussed in the narrative.

**Results of the review**
Eight studies (n=751) met the inclusion criteria: two cross-sectional comparative studies, one retrospective comparative study, two prospective case series and three retrospective case series.

One study scored 11 for quality, two studies scored 9, four studies scored 8 and one scored 7. Three studies provided grade III evidence and five provided grade IV. There was evidence of bias in all of the included studies.

The recovery rates ranged from 17 to 100%; most studies reported the attainment of normal or near normal function in more than 80% of the included participants. Three studies compared conservative management with surgery and provided conflicting evidence on their relative effectiveness. Two studies documented recovery in terms of severity of brachial plexus lesion: one showed that infants with minor lesions recover in less than 1 month following birth with conservative management, whereas the other showed that surgical management achieved a greater active shoulder range of motion compared with conservative management in infants with minor lesions.

**Authors' conclusions**
There is limited, inconclusive evidence for the effectiveness of primary conservative management for infants with OBPP. Further research is required.

**CRD commentary**
The review addressed a clear research question and was supported by well-defined inclusion criteria. A comprehensive search strategy was developed to identify relevant studies, with attempts made to limit publication bias; however, relevant studies might have been missed through the exclusion of non-English language studies. Methods were used to minimise reviewer error and bias in the study selection, data extraction and validity assessment processes. The internal and external validity of the included studies was assessed using defined criteria, although the quality scores assigned to studies may not be a reliable reflection of the validity of the included studies. However, the authors did consider the strength of the evidence in their presentation of the evidence.

Adequate details of the included studies were presented. The decision to combine studies using a narrative was
appropriate. Differences between the studies were also considered, and pertinent limitations in the available evidence were documented. In summary, this was a well-conducted and well-reported systematic review and the authors’ conclusion can be considered reliable. However, it should be noted that non-English language publications were not included in this review.

**Implications of the review for practice and research**

*Practice:* The authors stated that clinicians cannot seek guidance from the evidence regarding the effect of conservative intervention.

*Research:* The authors stated that further research to determine the effectiveness of primary conservative management for infants with OBPP is needed. To achieve this outcome, instruments with robust psychometric properties should be developed to accurately document change over time. Physiotherapists and occupational therapists should also have greater involvement in future research, to justify the treatment they provide.

**Funding**

Joanna Briggs Institute.

**Bibliographic details**


**Other publications of related interest**

Bialocerkowski A, Gelding B. Lack of evidence of the effectiveness of primary brachial plexus surgery for infants (under the age of two years) diagnosed with obstetric brachial plexus palsy Int J Evid Based Healthc 2006;4:264-87.

**Indexing Status**

Subject indexing assigned by CRD

**MeSH**
Birth Injuries /etiology; Brachial Plexus Neuropathies /rehabilitation /therapy; Infant; Paralysis, Obstetric /therapy /surgery; Physical Therapy Modalities; Reconstructive Surgical Procedures; Risk Factors; Treatment Outcome

**AccessionNumber**
12006008069

**Date bibliographic record published**
30/11/2007

**Date abstract record published**
30/11/2007

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.