Orthotics versus standard treatment in children with plagiocephaly

Clinical Bottom Lines:
1. Both Orthotics and counterpositioning were effective in decreasing Cranial Diagonal Differences in patients with plagiocephaly.
2. Orthotics are at least as effective as counterpositioning in decreasing Cranial Diagonal Differences in patients with plagiocephaly.


Level of Evidence: Level 2a. Using the CEBM hierarchy of evidence, this systematic review ranks at the level of 2a. This systematic review receives this level due to its properties of being a systematic review of homogenous cohort studies.

Clinical Question: In children diagnosed with plagiocephaly, are cranial orthotics more effective than other standard treatments in decreasing cranial and facial abnormalities?

The study: The review aimed at gathering all available evidence relevant to plagiocephaly treatments, and providing analysis of the strengths and weaknesses of the studies, as well as synthesize the results of those studies. Most studies reviewed were case series designed to measure the effectiveness of conservative interventions in treating plagiocephaly. Thirteen databases were searched including MEDLINE, CINAHL, PubMed and Pro quest 5000. Terms used to search these databases included ‘positional plagiocephaly’, ‘physiotherapy’, ‘helmet therapy’, ‘treatment’, ‘counterpositioning’, and synonyms for these words and phrases.

The study patients: The participants were young children who had been diagnosed with plagiocephaly. Most samples were of convenience, as they were largely recruited in the clinical setting. The sample sizes of the different studies ranged from 12 to 760. The average sample size was 200.

Studies include in this review: The review found 16 articles that matched their search criteria. The levels of evidence found in these studies were considerably low. 12 of the studies were case series, and labeled as level 4 evidence. The remaining 4 studies were comparative studies with considerable bias and were labeled as level 3 evidence.

Overview of studies reviewed: The studies reviewed delivered treatment to the patient via either counterpositioning, helmet therapy and/or physiotherapy. The decision for which treatment the patient received was not random, but based on severity of symptoms and age of patient at first treatment. Either change in Cranial Diagonal Differences or parent’s perceptions of results were measured. Treatments typically lasted until patients asymmetries had diminished to an acceptable level. Very little attrition
**Control Groups:** Due to was observed. ethics, there were no control groups in any of the studies reviewed. Any differences in the treatments given to the subjects were treatments of comparable nature.

**Summary of the evidence:** Outcome measures exhibited positive results in reducing cranial asymmetries for both helmet therapy and counterpositioning. Measures of statistical significance were not reported in the review, but could be found by reviewing each individual study. Helmet therapy was found to be more effective than counterpositioning in many studies, while a few found them only to be equal in effectiveness. Time to outcome was not dictated in this review. The low levels of evidence indicated considerable bias within the studies. The studies used at least one of four different anthropometric measures or recorded clinician’s and/or parents ratings of skull asymmetries.

**Comments:**
1. The reliability and validity of the tools used in the studies were not explored within the systematic review and only analyzed within 3 out of the 16 studies.
2. Not being able to randomly assign subjects to treatment groups was one definite source of bias. Inter-study reliability suffers as well due to large variations of tests used in obtaining outcome measures. A universal method of measuring outcomes is needed for future studies to ensure inter-study reliability.
3. There is a lack of higher level evidence related to treatments for plagiocephaly due to the inability to randomize trials.
4. The subjects of the studies reviewed were very diverse in age; therefore further research needs to be done relating the age of the patient with treatment methods in order to fully understand their relationship.

**Appraised by:** Colby Olsen  
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