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HELMET THERAPY VS. CONSERVATIVE THERAPY FOR THE TREATMENT OF POSITIONAL SKULL DEFORMATIONS

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Abstract

- Plagiocephaly and brachycephaly are skull deformations that occur in nearly half of all infants. These deformities are present at birth or can develop shortly after birth due to head positioning while lying supine. Depending on the severity of the deformity, infants may develop negative long-term developmental outcomes. There are generally two ways to treat such patients; repositioning or with use of orthotics (helmet therapy).
- A study of systematic reviews and cohort studies was completed to determine if orthotics (helmet) therapy is significantly more effective than repositioning therapy.
- The study indicated that infants diagnosed with moderate to severe plagiocephaly or brachycephaly will benefit most from helmet therapy in achieving complete correction, compared to those treated with repositioning therapy. Overall, there was a significantly greater mean percentage reduction of diagonal difference (61%) for the orthotic group than the mean percentage decrease for the repositioning group (52%).
- Positional skull deformations occur in nearly half of all infants today. It is important to be able to be able to diagnose a skull deformation, determine the degree of deformation, determine options for treatment, compare those options for treatments, and the risks associated with the treatment options
- Primary care health care providers can reduce the long term effects of plagiocephaly or brachycephaly by properly identifying and treating patients in a timely manner.

Introduction

- Plagiocephaly and brachycephaly are skull deformations that occur in nearly half of all infants.
- These deformities are either present at birth or can develop shortly after birth due to head positioning while lying supine.
- Depending on the severity of the deformity, infants may develop negative long-term developmental outcomes.
- There are generally two ways to treat such patients; conservative therapies such as repositioning or with the use of orthotics (helmet therapy).
- The purpose of this study is to determine whether the use of orthotics has a greater rate of complete correction of the deformation than repositioning therapy in infants diagnosed with plagiocephaly or brachycephaly

	Mild	Moderate	Severe
Lateral deformational plagiocephaly			
Key findings:	Flattening on back of skull only	Ipsilateral ear anteriorly displaced, ipsilateral frontal bossing	Ipsilateral temporal skull growth
Posterior deformational plagiocephaly (Brachycephaly)			
Key findings:	Central posterior deformity	Widening of posterior skull	Temporal bossing

Statement of the Problem

- Since the Back to Sleep Campaign was commenced in 1994, there has been an increase of deformational plagiocephaly and/or brachycephaly as high as 48% in infants.
- There are many other risk factors to deformational plagiocephaly and brachycephaly other than positional including, but not limited to, primagravidity, multiple births, restricted intrauterine environment, torticollis, and prematurity.
- With this increasing incidence, it is important for primary care providers to be able to properly diagnose a skull deformation in an infant and determine proper treatment.

Research Question

- In infants with positional cranial deformation, does helmet therapy, compared to repositioning therapy, have a greater rate of complete correction of deformation?

Literature Review

- It is important to diagnose plagiocephaly and brachycephaly early in an infant. This is because delaying corrective therapy until later in life may lead to incomplete or ineffective correction even if orthotic therapy is initiated. The general consensus from this literature review is that repositioning therapy is preferred over helmet therapy in patients younger than 4 months as well as those patients that have a mild or moderate skull asymmetry. Helmet therapy however is appropriate for infants 6 months or older for infants that have a severe asymmetry.
- In the majority of these studies it shows that the use of helmet therapy is superior to that of repositioning therapy when the degree of deformation is moderate persistent to severe. When it comes to mild to moderate positional skull deformation it is recommended that conservative therapies including repositioning be the first line therapy. If conservative therapies fail it is recommended to start helmet therapy around the age of 6 months for the best outcomes.



	Lateral deformational plagiocephaly	Posterior deformational plagiocephaly (brachycephaly)
Clinical findings		
Occiput (vertex view)	Ipsilateral occipital flattening Contralateral occipital bossing	Uniform occipital flattening
Ear position (vertex view)	Ipsilateral ear may be anteriorly displaced	Normal
Face, forehead (anterior, lateral, and vertex views)	May be normal; more severe cases may present with the following: mandibular asymmetry, ipsilateral frontal bossing, contralateral forehead flattening, ipsilateral cheek anteriorly displaced	Temporal bossing, increase in vertical height in severe cases
Other	Lateral deformational plagiocephaly	Posterior deformational plagiocephaly (brachycephaly)
	Torticollis, head position preference	Large size, history of limited activity or limited mobility
Severity ^a		
Mild	TDD ^b 3-10 mm Flattening restricted to the back of the skull (type I) ^c	CI ^d : 82%-90% Central posterior deformity ("pingpong ball depression") ^e
Moderate	TDD ^b 10-12 mm Malposition of ear (type II), forehead deformity (type III) ^c	CI ^d : 90% Central posterior deformity and widening of posterior skull ^e
Severe	TDD ^b > 12 mm Malar deformity (type IV), vertical or temporal skull growth (type V) ^c	CI ^d : > 100% Vertical head, head growth, or temporal bossing ^e

Discussion

- It is extremely important to be able to determine the degree of deformation as this will help in the choice of therapy. The table above helps to show how to determine type and severity of lateral and posterior deformational plagiocephaly.

Applicability to Clinical Practice

- It is important for primary care providers as well as pediatricians to be able to diagnose non-synostotic plagiocephaly to begin early treatment.
- These studies have shown that orthotic therapy has proven to be superior to that of repositioning therapy in the case of moderate persistent to severe non-synostotic plagiocephaly.
- It is essential for primary care providers to be able to distinguish between mild to severe skull deformations to be able to proceed with the best course of action.
- There has been an increasing amount of studies over the last years to prove the benefits of orthotics.
- This information can change the practice of primary providers to make them more aware of the infants' skull shape to allow for early detection and early treatment if necessary.
- The more that a provider knows about skull deformations and the treatments available, the better equipped a provider is to treat a patient.



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