

ONLINE EXCLUSIVE

Use physical therapy to head off this deformity in infants

Consider early PT to prevent severe deformational plagiocephaly.

Practice changer

Identify infants with positional preference early and consider referral to pediatric physical therapy at 7 or 8 weeks to prevent severe deformational plagiocephaly (DP).¹

Strength of recommendation:

B: Based on a single well-done randomized controlled trial (RCT).

van Vlimmeren LA, van der Graaf Y, Boere-Boonekamp MM, et al. Effect of pediatric physical therapy on deformational plagiocephaly in children with positional preference: a randomized controlled trial. *Arch Pediatr Adolesc Med.* 2008;162:712-718.

ILLUSTRATIVE CASE

During a routine checkup of a 2-month-old boy, you notice that the left side of his head is slightly flatter than the right and his forehead protrudes forward more on the left than the right. His birth history and development are normal. You wonder if the asymmetry will resolve as the infant grows older or whether you should suggest immediate treatment.

The American Academy of Pediatrics recommends putting babies to sleep on their backs to reduce the risk of sudden infant death syndrome.

As more parents have followed this recommendation, the incidence of positional preference and DP has increased, presumably because external pressure distorts the malleable infant cranium. Prenatal and intrapartum factors also can cause DP, but sleeping on the back likely accounts for the recent increase.²⁻⁴

Not just a cosmetic issue

Although many clinicians consider skull deformities to be purely cosmetic,⁵ plagiocephaly is associated with auditory processing disorders, mandibular asymmetry, and visual field defects. Head deformities resulting from premature fusion of the cranial sutures (craniosynostosis) have been linked to an increased incidence of speech-language, cognitive, behavioral, and neurodevelopmental abnormalities.^{6,7} Whether these associations are causal is not yet known.⁵ Many parents believe that unattractive facial features lead to adverse effects on children, such as teasing and poor self-esteem.^{5,6}

Conservative treatments for positional preference and DP include parental counseling, counter-positioning, simple exercises, and orthotic devices such as helmets.⁸ Scientific evidence supporting the effectiveness of these approaches is weak. The study we review

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FAST TRACK

More babies sleeping on their back likely accounts for the recent increase in the incidence of positional preference and DP.

PURLs methodology

This study was selected and evaluated using FPIN's Priority Updates from the Research Literature (PURL) Surveillance System methodology. The criteria and findings leading to the selection of this study as a PURL can be accessed at www.jfponline.com/purls.

in this PURL provides strong evidence of the effectiveness of 1 intervention—physical therapy (PT).

STUDY SUMMARY

■ Early physical therapy prevents severe DP

van Vlimmeren and colleagues conducted a prospective RCT comparing PT with usual care for preventing DP.¹ From a group of 400 infants born consecutively in the Netherlands, they identified 65 with positional preference at 7 weeks of age and randomized them to PT or a control group. Pediatric physical therapists blinded to group allocation evaluated each infant at 6 and 12 months. Babies with congenital muscular torticollis (defined as preferential posture of the head and asymmetrical cervical movements caused by a unilateral contracture of the sternocleidomastoid muscle), dysmorphisms, or congenital syndromes were excluded.

The PT and control groups were comparable at baseline. Parents of infants in the control group received a pamphlet about basic preventive measures, but no additional instructions. Infants in the intervention group received standardized pediatric PT from trained therapists who were unaware of the results of the infants' baseline assessments.

PT consisted of 8 sessions between 7 weeks and 6 months of age. The first 4 sessions were held weekly; subsequent sessions occurred every 2 to 3 weeks. The second through fifth sessions took place at the infant's home.

The intervention included exercises to reduce positional preference and stimulate motor development, along with parental counseling about counter-positioning, handling, nursing, and the causes of positional preference. Parents received a pamphlet describing basic measures to prevent DP. The therapists also encouraged earlier and more frequent play times in the prone position ("tummy time"). PT was discontinued when the infant no longer demonstrat-

ed positional preference while awake or asleep, parents were following advice about handling, and the baby exhibited no signs of motor developmental delay or asymmetries.

The primary outcome was severe DP, measured as an oblique diameter difference index (ODDI) score of 104% or more—a score representing asymmetry of the skull that is obviously noticeable and therefore considered clinically relevant.⁹ The secondary outcome measures were symmetry in posture and active movements, motor development, and passive range of motion of the cervical spine.

Intervention reduced DP at 6 and 12 months. By 6 months of age, the number of infants in the intervention group with severe DP had decreased significantly from 53% to 30%, compared with a decrease from 63% to 56% in the control group (relative risk [RR]=0.54; 95% confidence interval [CI], 0.30-0.98; number needed to treat [NNT]=3.85). At 12 months, the number of babies in the intervention group with severe DP had decreased further, to 24%, whereas the number in the control group remained unchanged at 56% (RR=0.43; 95% CI, 0.22-0.85; NNT=3.13).

Secondary outcomes comparable. No major differences in secondary outcomes were noted between the 2 groups. At 6 and 12 months of age, none of the infants had positional preference or differences in motor development. Passive range of motion of the cervical spine was within normal range and symmetrical in all infants at baseline and at 6 and 12 months. However, at the 6-month evaluation, parents of babies in the intervention group demonstrated greater symmetry and less left orientation in nursing, positioning, and handling of the infants.

WHAT'S NEW

■ Early intervention trumps conservative therapies

This is the first RCT of a pediatric PT program to treat infants with position-

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Beyond cosmetic concerns, DP is associated with problems such as auditory processing disorders, mandibular asymmetry, and visual field defects.

CONTINUED

al preference to prevent severe plagiocephaly, and the study provides strong evidence to support this practice. The study included healthy infants, much like the ones we encounter in primary care practice. If, as we suspect, many of us have been recommending conservative therapies, we have reason to consider referral for this increasingly common clinical problem.

CAVEATS

■ Study did not focus on serious deficits

This study excluded infants with congenital muscular torticollis, dysmorphisms, or other congenital syndromes. We need to be aware of these causes of DP, which may warrant additional referrals beyond pediatric PT. In addition, DP should be distinguished from craniosynostosis, which requires referral for surgical evaluation and treatment.

Cosmetic issues vs more serious problems. DP is the most benign of the many causes of head deformities. The outcomes of this trial mainly addressed the cosmetic issue rather than more serious deficits associated with plagiocephaly. Nevertheless, we believe that cosmetic considerations are important to parents and children. What's more, the intervention carries no risk of adverse effects and produces notable benefit. We conclude that discussing PT referral with parents is the appropriate practice change to implement based on this study.

Infant age, length of follow-up. Because this study did not evaluate the impact of the intervention on infants older than 7 to 8 weeks, it is not clear whether PT would be as effective if begun later in infancy. The relatively short follow-up (12 months) precludes conclusions about outcomes such as social functioning and school performance.

CHALLENGES TO IMPLEMENTATION

■ A matter of time

The incidence of positional preference has been reported to be as high as

22% at 7 weeks, making it a relatively common problem encountered by family physicians.⁷ Most children with positional preference do not develop DP and when they do, it is typically a cosmetic problem. Ruling out torticollis, craniosynostosis, and other congenital causes is critical. Ascertaining parental preference is a major consideration in the decision to refer for PT. All of this takes time.

However, parents are often concerned about their baby's misshapen skull. We think that addressing positional preference is time well spent, especially since we now have evidence that a non-invasive approach—PT—can effectively prevent DP. ■

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