CONTROL ID: 2542905

TITLE: TORTLE™ AND PHYSICAL THERAPY VERSUS PHYSICAL THERAPY ALONE IN INFANTS WITH PLAGIOCEPHALY

PRESENTATION TYPE: Poster

CURRENT SECTION: Pediatrics

Author Details

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Student Category - Research Report: Not a Student

Abstract

ABSTRACT BODY:

Purpose/Hypothesis : 1) To determine if infants with plagiocephaly attain better head symmetry with physical therapy (PT) and Tortle™ (a positioning cap) than with PT alone; 2) to determine the effect of PT with and without Tortle™ on neck passive range of motion (PROM), muscle strength, resting head posture and gross motor development.

Number of Subjects : 14 infants < 6 months old with plagiocephaly, without exclusion for torticollis. All subjects were cleared of cranial synostosis and had atypical baseline head shapes: Cephalic Index (CI) ≥ 93, or Oblique Cranial Length Ratio (OCLR) ≥106[1]. Subjects were randomly assigned to groups using concealed allocation: PT plus Tortle™ or PT alone.

Materials/Methods : All subjects received PT at least 1 hour per week, including education on positioning. Subjects assigned to “PT plus Tortle™ also received a Tortle™. Data collections occurred monthly. Primary measures were related to head shape (OCLR and CI) and were calculated from photos entered into the HeadsUp™ program developed and tested by Hutchison et al.[1] Heads were also measured by 2 assessors using a Palpation Meter (PALM) along lines drawn 40 degrees off of midline on a skull cap. Secondary measures, done by 3 blind assessors, included the Alberta Infant Motor Scale (AIMS) from videotapes and neck strength (Muscle Function Scale, MFS), PROM (lateral tilt and rotation) and resting tilt (supine and sitting) from photographs.

Results : Interrater reliability using ICC 2,1 was >.9 for all measures, except neck rotation was .78 and MFS was .7. Infants showed a significant difference in head shape over time in the PT plus Tortle™ group (OCLR at 40 degrees from midline, t=4.12, p=.006), but not in the PT alone group (t=-1.43, p=0.21). The group comparison of OCLR at discharge was not significantly different, t=1.51, p=.16, but Cohens d was .8. AIMS Totals showed significant improvement over time in both groups (PT plus Tortle™ t=-3.90, p=.008 and PT alone t=-4.35, p=.0005). MFS on the weaker side got significantly stronger over time in both groups (PT plus Tortle™ t=-3.67, p=.01 and PT alone t=-3.57, p=.01). Rotation PROM on the tighter side showed a significant increase over time (t=2.57, p=.04) in the PT alone group, but not in the PT plus Tortle™ group (t=1.97, p=.1). A number of strong correlations were found including between baseline head shape (OCLR) and supine resting head tilt (r=.9).

Conclusions : These pilot data support use of PT plus Tortle™ to improve head symmetry; and PT to improve neck rotation, strength, and gross motor development in infants with plagiocephaly.

Clinical Relevance : Physical therapy with Tortle™ was better for infants with plagiocephaly than PT alone. If started young enough, this intervention may decrease the need for an infant to obtain a helmet. All the infants in this study had plagiocephaly and asymmetries in neck strength, PROM, and head posture, and delayed Gross Motor development; all of which responded to physical therapy.

KEYWORDS: Plagiocephaly, Physical Therapy, Infants.