

Helmet Treatment of Deformational Plagiocephaly: The Relationship Between Age at Initiation and Rate of Correction

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Abstract:

Background: The purpose of this study was to evaluate the relationship between age at initiation of helmet therapy for deformational plagiocephaly and the rate of correction.

Methods: Infants treated for deformational plagiocephaly with a helmet orthosis between 2009 and 2010 were included. Patients were prospectively stratified by the age treatment was initiated - Group 1: under 20 weeks (N=26); Group 2: 20-23.9 weeks (N=59); Group 3: 24-27.9 weeks (N=82); Group 4: 28-31.9 weeks (N=62); Group 5: 32-35.9 weeks (N=45); Group 6: 36-40 weeks (N=29); Group 7: greater than 40 weeks (N=43). Pre and post treatment calvarial asymmetry was measured using direct anthropometry and reported as a transcranial difference (TCD).

Results: 346 infants were included; initial TCD was equivalent on all paired-group comparisons (Table 1). Duration of helmet therapy positively correlated with age at initiation ($r = 0.89, p < 0.05$). The rate of change in TCD negatively correlated with age at treatment onset ($r = -0.88, p < 0.05$): Group 1, 0.93 mm/week; Group 2: 0.64 mm/week; Group 3: 0.59 mm/week; Group 4: 0.56 mm/week; Group 5: 0.41 mm/week; Group 6: 0.42 mm/week; Group 7: 0.42 mm/week). At the conclusion of therapy, all groups had improved calvarial symmetry, albeit less completely in groups 6 and 7.

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
	< 20 Weeks	20-23.9 Weeks	24-27.9 Weeks	28-31.9 Weeks	32-35.9 Weeks	36-40 Weeks	> 40 Weeks
Total patients	26	59	82	62	45	29	43
Age at fitting, wks	16.9	22.3	25.9	30.3	33.6	37.3	44.7
Compliance, hrs/day	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Duration, weeks	7.8	9.0	8.7	10.2	9.9	13.0	10.4
Initial TCD, mm	11.0	12.0	10.5	10.5	11.0	10.0	10.0
Final TCD, mm	5.0	5.0	5.0	5.0	5.0	6.0	6.0

Table 1. Duration, Compliance, and Calvarial Asymmetry versus Age at Helmet Therapy Initiation

Conclusions: The correction rate of plagiocephaly with helmet therapy decreases with increasing infant age; after 32 weeks, there is a slow and relatively constant rate of change. Improvement can still be achieved in infants older than 12 months of age.

Disclosure/Financial Support

Mr. Taylor is an employee of Boston Brace. The remaining authors do not have any financial interest in the products, devices, or drugs mentioned in the study.