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Predictors of Preoperative Developmental Delay in Nonsyndromic Sagittal Craniosynostosis

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Introduction

Patients with nonsydromic sagittal craniosynostosis(SC) were previously thought to have normal neurocognitive development; however, a pattern of mild delays has been described in these patients. We reviewed our patients with SC to identify potential perinatal risk factors that serve as indicators for subsequent developmental delay.

Methods

Nonsyndromic patients with SC(N=66)completed preoperative Bayley Scales of Infant and Toddler Development(III) with a single examiner between 8/2009 and 4/2015. Patients were classified as having no delays(n=52;79%) or having delays (n=14;21%) below the ninth percentile in one or more area(s) of development. Mean differences were compared using Multivariate Analyses of Variance.

Learning Objectives

Predictors of developmental delay in nonsydromic sagittal craniosynostosis

Results

Participants were mostly male (79%) and aged 2-12 months at testing. There were no group differences in sociodemographic categories. Prenatally, patients in the group with delays vs the group with no delays had lower gestational age in weeks(36.9 vs. 39.2,p < .000) with higher rates of gestational diabetes (36% vs 6%,p=.002) and premature rupture of membranes (14% vs 0%,p=.006). There were no group differences in maternal hypertension, maternal age, breech position, preterm labor, emergency C-section, or failure to progress. At birth, patients with delays had lower birth weight in grams (2982 vs. 3359, p = .041), higher rates of respiratory distress (29% vs 4%, p = .005), additional medical diagnoses (57% vs 15%, p = .001), and longer NICU stays in weeks (1.6 vs. 0 .2, p = .001). There were no differences for infection, hyperbilirubinemia, age at CS diagnosis, or subsequent surgery age.

Conclusions

Patients with SC with delays in development had a lower gestational age and birth weight with more prenatal and birth complications. Further studies are required to validate appropriate followup and genetic testing in these groups.

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