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Characterization of Perinatal Risk Factors and Complications Associated with Non-Syndromic Craniosynostosis in North Carolina

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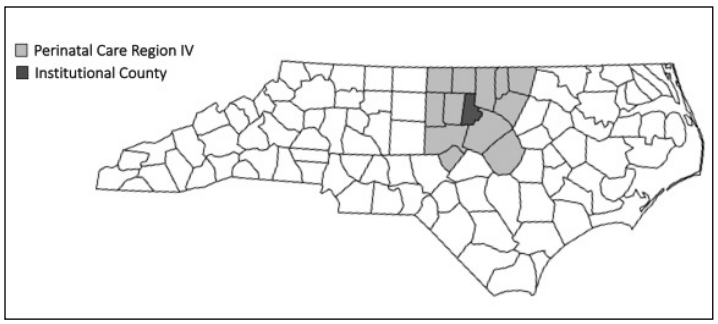
Introduction

Certain intrauterine risk factors are known to increase the risk of premature cranial suture fusion and may cause complications during birth. Some of these risk factors may be modifiable. Therefore, we sought to characterize our institutional patterns of prenatal risk factors and perinatal complications in non-syndromic craniosynostosis patients compared to normal births from the surrounding area to identify areas for possible intervention or prevention.

Methods

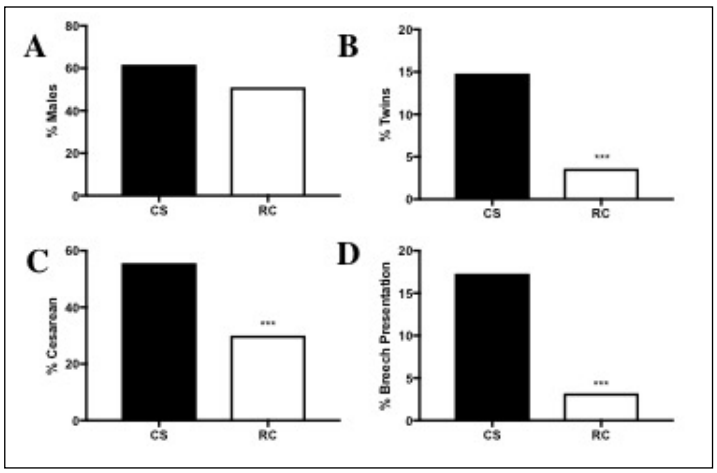
The medical records of all infants with non-syndromic craniosynostosis born at Duke University Health System from 2006-2017 were retrospectively reviewed. Maternal comorbidities, prenatal risk factors, and perinatal complications were collected. The North Carolina State Center for Health Statistics was queried for perinatal statistics from Durham county and the Northeastern Perinatal Care Region to represent a control cohort of normal births from the same time period and region. The primary outcome was the incidence of prenatal risk factors and complications at birth associated with premature suture fusion.



Results

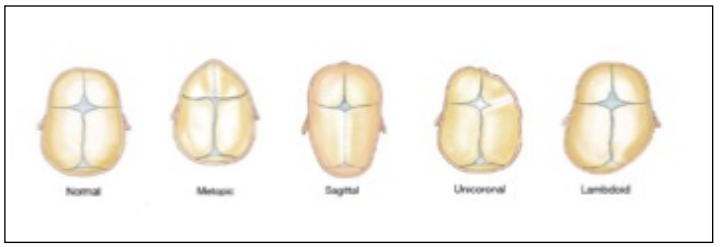
Eighty births with non-syndromic craniosynostosis were included in this study. The majority of these patients were male (61.7%) and born via cesarean section (55.0%). Intrauterine growth restriction (IUGR) occurred in 10.0% and head trauma during delivery occurred in 2.5%. Twinning (14.8% vs. 3.6%, p<0.0001), cesarean births (55.5% vs. 30.0%, p<0.0001), and breech presentation (17.3% vs. 3.2%, p<0.0001) were significantly more common in craniosynostosis patients. Prenatally, mothers of craniosynostosis infants had higher incidence of gestational diabetes (13.5% vs. 5.0%, p<0.0001) and oligohydramnios (6.1% vs. 1.3%, p<0.0001) compared to regional controls.

Figure 2. Comparison of craniosynostosis perinatal characteristics including A) male gender, B) twinning, C) cesarean delivery, and D) breech presentation compared to regional controls. *CS = craniosynostosis; RC = regional control; ***=p<0.001*



Learning Objectives

By the conclusion of this session, participants should be able to: 1) Characterize prenatal risk factors for the development of craniosynostosis, 2) Describe intrapartum complications that may result from premature suture fusion, and 3) Propose future directions for reducing intrapartum risk in this population, particularly related to refining prenatal diagnostic tools.



Conclusions

Our study demonstrates that premature suture fusion is associated with prenatal risk factors such as gestational diabetes and oligohydramnios. Continued research into potentially modifiable prenatal risk factors and more refined prenatal diagnostic tools has the potential to reduce both the incidence of premature suture fusion and the sequelae of birth complications in this population.

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