186 EVIDENCE OF FETAL HYPOXIC BRAIN INJURY IN ISOLATED CONGENITAL HEART DEFECT (CHD) AS DETERMINED BY NEWBORN MICROCEPHALY

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OBJECTIVE: Evidence suggests increased risk of fetal cerebral hypoxemia in CHD. Hypoxic brain injury could lead to poor brain growth and development. The risk of poor fetal brain growth as determined by newborn microcephaly was ascertained in isolated CHD.

STUDY DESIGN: Head circumference (HC) was compared in 401 cases of isolated (non-chromosomal, non-syndromic) CHD cases vs matched controls. Microcephaly was defined as HC < 3rd percentile. Univariate and logistic regression analyses were performed to controlling for the effect of over 18 potential confounders including birthweight, type of heart lesion, and mixing (mixing of oxygenated and non-oxygenated blood) vs non-mixing lesion.

RESULTS: Mean (SD) gestational age and birthweight were 38.1 (2.4) vs 38.5 (2.7) wks, p=ns, and 3018.8 (722.6) vs 3088 (639.7) gm, p< 0.01, in cases vs controls. The mean (SD) HC were 33.3 (2.4) cm and 33.6 (2.0) cm, p=0.04 in cases compared to controls. When only SGA cases from both groups were evaluated the HC difference was still significant (p=0.037). Comparison of controls, non-mixing and mixing CHD lesions showed a significant progressive reduction of HC mean (SD): 33.6 (2.0), 33.4 (2.5) and 33.2 (2.3) cm (p=0.02), respectively. This persisted after removal of SGA cases (p=0.037). Overall, the presence of an isolated fetal CHD significantly increased the risk of newborn microcephaly 56/401(14%) vs 34/401(8.4%), p=0.024. Anomalies that were significant independent predictors of microcephaly in CHD were tetralogy of Fallot, OR (95%, CI) 2.6 (1.1, 6.3), p< 0.04 and coarctation of the aorta, OR (95% CI) 2.8 (1.5, 5.1), p < 0.001. Corresponding rates of microcephaly were 23.5% and 21.7% respectively.

CONCLUSION: High rates of microcephaly in categories of isolated CHD provide evidence of intrauterine brain injury consistent with chronic cerebral hypoxemia. Implications for prenatal management including parental counseling, need and timing of antenatal surveillance, and possibly earlier delivery in appropriate cases will need to be addressed.

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187 TEMPORAL CHANGES IN HEALTH INEQUALITIES IN PERINATAL AND INFANT MORTALITY IN SCOTLAND, BETWEEN 1985 AND 2004

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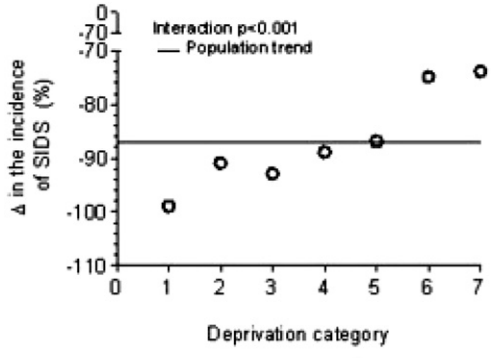
OBJECTIVE: To determine whether population trends in rates of perinatal and infant death differed in relation to socioeconomic deprivation.

STUDY DESIGN: We studied 1,138,864 singleton births between 28 and 43 weeks with birthweight greater than 500g, in Scotland between 1985 and 2004 using data from national registries of births and perinatal deaths. Socioeconomic status was estimated using Carstairs socioeconomic deprivation categories (1=least through to 7=most deprived) which is derived from census data within postcode sectors of residence. Analysis was by multivariable logistic regression.

RESULTS: All types of perinatal and infant death declined over the period 1985 and 2004. The reductions were most marked for neonatal death following preterm birth (75%, 95% CI 67-81%) and infant deaths (73%, 95% CI 68-77), less marked for explained stillbirth (51%, 95% CI 39-60%) and delivery-related perinatal death at term (39%, 95% CI 20-53), and smallest for unexplained stillbirth (31%, 95% CI 20-41%). The magnitude of decline did not significantly differ in relation to socioeconomic deprivation for all categories of death (p>0.05 for interaction) except for infant death due to SIDS (p<0.001 for interaction). The improvement was greater among less deprived women (Figure).



Trend of SIDS by deprivation status

CONCLUSION: There have been population-wide improvements in the incidence of perinatal and infant mortality across the whole range of socioeconomic deprivation. However there is evidence of increasing health inequality in the incidence of SIDS.

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188 NON-ANOMALOUS STILLBIRTH BY GESTATIONAL AGE: TRENDS DIFFER BASED ON METHOD OF EPIDEMIOLOGIC CALCULATION

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OBJECTIVE: Controversy exists regarding the appropriate epidemiologic parameters to study the devastating complication of stillbirth. Our purpose was to determine and compare population based, gestational age specific rates, risks, and prospective risks of stillbirth.

STUDY DESIGN: Retrospective cohort of all women with a Utah live birth or stillbirth certificate of a singleton non-anomalous pregnancy filed during 2000-2003. Epidemiologic terms were chosen to maintain consistency with previous literature. Rate was calculated as the number of stillbirths divided by the number of live births at a given gestational age. Risk was calculated as the number of stillbirths at a given gestational age divided by the number of remaining viable pregnancies. Prospective risk was calculated by dividing the number of undelivered patients destined to have a stillbirth by the number of ongoing viable pregnancies at one week gestational age increments.

RESULTS: 186,724 live births and 772 stillbirths met inclusion criteria. The stillbirth rate was highest at 20 weeks gestation (745.4/1000), fell to a nadir of 0.529/1000 at 41 weeks, and then rose at 42 weeks to 2.81/1000. In contrast, the risk was low earlier in gestation, with a nadir of 0.0966/1000 at 29 weeks, and gradually rose with increasing gestational age, with a sharp increase to a maximum of 2.969/1000 at 42 weeks. The prospective risk was highest (4.112/1000) at 20 weeks, fell to a nadir of 0.704/1000 at 40 weeks, and rose sharply to 2.70/1000 at 42 weeks.

CONCLUSION: Important differences in trends of stillbirth are noted across gestational ages depending on the epidemiologic calculation used. All of these calculations are useful in clinical practice, and are crucial to further mechanistic investigation. However, clinicians and investigators must tailor their choice of method(s) based on the clinical situation and/or epidemiologic question.

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189 EXPANDED ACCESS TO FAMILY PLANNING SERVICES AND THE RISK OF ADVERSE PREGNANCY OUTCOMES

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OBJECTIVE: The risk of unintended pregnancy, short interpregnancy intervals and adverse pregnancy outcomes are higher among women of lower socioeconomic status, for whom access to health care and family planning before and between pregnancies may not be assured. We explore the temporal association between state family planning expansions and changes in pregnancy outcomes among women in several U.S. states.

STUDY DESIGN: We performed a population-level cross sectional study. Using data from the CDC Pregnancy Risk Assessment Monitoring System, we compared pregnancy outcomes among women living in four states with family planning expansions (AL, FL, NY, SC) in the time preceding the expansions to the time following them. Changes over time were compared with changes in two states without family planning expansions (LA, NC) during a similar time period, using tests of interaction.

RESULTS: Data were collected from a total of 38,443 women in the six states. During the study period (range 1996-2002), average gestation shortened by 0.14 weeks (95%CI [0.09, 0.18]) and birth weight declined by 26.1g (95% CI [11.2, 44.1]) in the states studied. In adjusted models, among nulliparous women, two significant "intervention by time" interactions were noted. While gestational age at delivery remained stable over time in states with family planning expansions (intervention states), there was a decrease in control states (p-value for interaction term = 0.032). There was also a trend towards a lower odds of very preterm births and very low birth weight births among nulliparous women in intervention states (p-values for interaction terms = 0.044 and 0.062, respectively).

CONCLUSION: At a population level and in their current form, little impact of state family planning expansions was noted on the risk of adverse pregnancy outcomes and mitigation of declines in gestational age in those states studied. To achieve their maximum potential, efforts to improve participation in these programs could be undertaken.

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