September 2015 Literature Alert

1.

Position statement from the Chromosome Abnormality Screening Committee on behalf of the Board of the International Society for Prenatal Diagnosis.

Benn P, Borrell A, Chiu RW, Cuckle H, Dugoff L, Faas B, Gross S, Huang T, Johnson J, Maymon R, Norton M, Odibo A, Schielen P, Spencer K, Wright D, Yaron Y.

No abstract

2.

Effectiveness of physical activity interventions on preventing gestational diabetes mellitus and excessive maternal weight gain: a meta-analysis.

Sanabria-Martínez G, García-Hermoso A, Poyatos-León R, Álvarez-Bueno C, Sánchez-López M, Martínez-Vizcaíno V.

Abstract

BACKGROUND:

It is commonly accepted that pregnancy-related physiological changes (circulatory, respiratory, and locomotor) negatively influence the daily physical activity of pregnant women.

OBJECTIVES:

The aim of this study is to conduct a meta-analysis of randomised controlled trials (RCTs) for

assessing the effectiveness of physical exercise interventions during pregnancy to prevent gestational diabetes mellitus and excessive maternal weight gain.

SEARCH STRATEGY:

Keywords were used to conduct a computerised search in six databases: Cochrane Library Plus, Science Direct, EMBASE, PubMed, Web of Science, and ClinicalTrials.gov.

SELECTION CRITERIA:

Healthy pregnant women who were sedentary or had low levels of physical activity were selected for RCTs that included an exercise programme.

DATA COLLECTION AND ANALYSIS:

Two independent reviewers extracted data and assessed the quality of the included studies. Of 4225 articles retrieved, 13 RCTs (2873 pregnant women) met the inclusion criteria. Pooled relative risk (RR) or weighted mean differences (WMDs) (depending on the outcome measure) were calculated using a random-effects model.

MAIN RESULTS:

Overall, physical exercise programmes during pregnancy decreased the risk of gestational diabetes mellitus (RR = 0.69; P = 0.009), particularly when the exercise programme was performed throughout pregnancy (RR = 0.64; P = 0.038). Furthermore, decreases were also observed in maternal weight (WMD = -1.14 kg; 95% CI -1.50 to -0.78; P < 0.001). No serious adverse effects were reported.

CONCLUSION:

Structured moderate physical exercise programmes during pregnancy decrease the risk of gestational diabetes mellitus and diminish maternal weight gain, and seem to be safe for the mother and the neonate; however, further studies are needed to establish recommendations.

TWEETABLE ABSTRACT:

Exercise programmes decreased the risk of gestational diabetes mellitus and excessive weight gain.

KEYWORDS:

Exercise; gestational diabetes mellitus; maternal weight gain; physical activity; pregnancy

3.

Associations Between Residential Proximity to Power Plants and Adverse Birth Outcomes.

Ha S, Hu H, Roth J, Kan H, Xu X.

Abstract

Few studies have assessed the associations between residential proximity to power plants and adverse birth outcomes including preterm delivery (PTD), very preterm delivery (VPTD), and term low birth weight (LBW). We geocoded 423,719 singleton Florida births born from 2004 to 2005 and all active power plants and determined residential proximity to the nearest power plant for each birth. Prenatal exposure to particulate matter less than 2.5 μm in diameter for women living near different types of power plants was also determined by using National Environmental Public Health Tracking Network data. Logistic regression models were used to test the hypothesized associations. Women who lived closer to coal and solid waste power plants were exposed to higher levels of particulate matter less than 2.5 μm in diameter compared with other types. We observed a 1.8% (95% confidence interval (CI): 1.3, 2.3) increased odds for PTD, 2.2% (95% CI: 1.0, 3.4) for VPTD, and 1.1% (95% CI: 0.2, 2.0) for term LBW for each 5 km closer to any power plant. When stratifying by different fuel type, we found that only solid waste had an association with term LBW, whereas oil, gas, and solid waste all had an association with PTD and VPTD. Results were consistent when exposure was categorized by number of power plants. Our study found evidence of increasing odds of adverse birth outcomes among infants born to pregnant women living closer to power plants. More research is warranted to better understand the causal relationship.

4.

[Trends in Care Practices, Morbidity, and Mortality of Extremely Preterm Neonates, 1993-2012](#).

Stoll BJ, Hansen NI, Bell EF, Walsh MC, Carlo WA, Shankaran S, Laptook AR, Sánchez PJ, Van Meurs KP, Wyckoff M, Das A, Hale EC, Ball MB, Newman NS, Schibler K, Poindexter BB, Kennedy KA, Cotten CM, Watterberg KL, D'Angio CT, DeMauro SB, Truog WE, Devaskar U, Higgins RD; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Collaborators (202)

Abstract

IMPORTANCE:

Extremely preterm infants contribute disproportionately to neonatal morbidity and mortality.

OBJECTIVE:

To review 20-year trends in maternal/neonatal care, complications, and mortality among extremely preterm infants born at Neonatal Research Network centers.

DESIGN, SETTING, PARTICIPANTS:

Prospective registry of 34,636 infants, 22 to 28 weeks' gestation, birth weight of 401 to 1500 g, and born at 26 network centers between 1993 and 2012.

EXPOSURES:

Extremely preterm birth.

MAIN OUTCOMES AND MEASURES:

Maternal/neonatal care, morbidities, and survival. Major morbidities, reported for infants who survived more than 12 hours, were severe necrotizing enterocolitis, infection, bronchopulmonary dysplasia, severe intracranial hemorrhage, cystic periventricular leukomalacia, and/or severe retinopathy of prematurity. Regression models assessed yearly changes and were adjusted for study center, race/ethnicity, gestational age, birth weight for gestational age, and sex.

RESULTS:

Use of antenatal corticosteroids increased from 1993 to 2012 (24% [348 of 1431 infants]) to 87% (1674 of 1919 infants]; P < .001), as did cesarean delivery (44% [625 of 1431 births] to 64% [1227 of 1921]; P < .001). Delivery room intubation decreased from 80% (1144 of 1433 infants) in 1993 to 65% (1253 of 1922) in 2012 (P < .001). After increasing in the 1990s, postnatal steroid use declined to 8% (141 of 1757 infants) in 2004 (P < .001), with no significant change

thereafter. Although most infants were ventilated, continuous positive airway pressure without ventilation increased from 7% (120 of 1666 infants) in 2002 to 11% (190 of 1756 infants) in 2012 (P < .001). Despite no improvement from 1993 to 2004, rates of late-onset sepsis declined between 2005 and 2012 for infants of each gestational age (median, 26 weeks [37% {109 of 296} to 27% {85 of 320}]; adjusted relative risk [RR], 0.93 [95% CI, 0.92-0.94]). Rates of other morbidities declined, but bronchopulmonary dysplasia increased between 2009 and 2012 for infants at 26 to 27 weeks' gestation (26 weeks, 50% [130 of 258] to 55% [164 of 297]; P < .001). Survival increased between 2009 and 2012 for infants at 23 weeks' gestation (27% [41 of 152] to 33% [50 of 150]; adjusted RR, 1.09 [95% CI, 1.05-1.14]) and 24 weeks (63% [156 of 248] to 65% [174 of 269]; adjusted RR, 1.05 [95% CI, 1.03-1.07]), with smaller relative increases for infants at 25 and 27 weeks' gestation, and no change for infants at 22, 26, and 28 weeks' gestation. Survival without major morbidity increased approximately 2% per year for infants at 25 to 28 weeks' gestation, with no change for infants at 22 to 24 weeks' gestation.

CONCLUSIONS AND RELEVANCE:

Among extremely preterm infants born at US academic centers over the last 20 years, changes in maternal and infant care practices and modest reductions in several morbidities were observed, although bronchopulmonary dysplasia increased. Survival increased most markedly for infants born at 23 and 24 weeks' gestation and survival without major morbidity increased for infants aged 25 to 28 weeks. These findings may be valuable in counseling families and developing novel interventions.

TRIAL REGISTRATION:

clinicaltrials.gov Identifier: NCT00063063.

PMID: 26348753

5.

[A meta-analysis of risk of pregnancy loss and caffeine and coffee consumption during pregnancy](#).

Li J, Zhao H, Song JM, Zhang J, Tang YL, Xin CM.

Abstract

BACKGROUND:

Previous reports of the relationship between pregnancy loss and caffeine/coffee consumption have been inconsistent.

OBJECTIVES:

To evaluate the association between pregnancy loss and caffeine and coffee consumption.

SEARCH STRATEGY:

PubMed was searched for reports published before September 2014, with the keywords "caffeine," "coffee," "beverage," "miscarriage," "spontaneous abortion," and "fetal loss."

SELECTION CRITERIA:

Case-control and cohort studies were included when they had been reported in English, the exposure of interest was caffeine/coffee consumption during pregnancy, the outcome of interest was spontaneous abortion or fetal death, and multivariate-adjusted odds ratios (ORs) or risk ratios were provided or could be calculated.

DATA COLLECTION AND ANALYSIS:

Data were extracted and combined ORs calculated.

MAIN RESULTS:

Overall, 26 studies were included (20 of caffeine and eight of coffee). After adjustment for heterogeneity, caffeine consumption was associated with an increased risk of pregnancy loss (OR 1.32, 95% confidence interval [CI] 1.24-1.40), as was coffee consumption (OR 1.11, 95% CI 1.02-1.21). A dose-response analysis suggested that risk of pregnancy loss rose by 19% for every increase in caffeine intake of 150mg/day and by 8% for every increase in coffee intake of two cups per day.

CONCLUSIONS:

Consumption of caffeine and coffee during pregnancy seems to increase the risk of pregnancy loss.

PMID: 26026343

6.

Mortality and morbidity in early preterm breech singletons: impact of a policy of planned vaginal delivery.

Kayem G, Combaud V, Lorthe E, Haddad B, Descamps P, Marpeau L, Goffinet F, Sentilhes L.

Abstract

OBJECTIVE:

To compare neonatal morbidity and mortality rates in preterm singleton breech deliveries from 26(0/7) to 29(6/7) weeks of gestation in centers with a policy of either planned vaginal delivery (PVD) or planned cesarean delivery (PCD).

STUDY DESIGN:

Women with preterm singleton breech deliveries occurring after preterm labor or preterm premature rupture of membranes (pPROM) were identified from the databases of five perinatal centers and classified as PVD or PCD according to the center's management policy. The independent association between planned mode of delivery and the risk of neonatal hospital death or morbidity was tested and quantified with ORs through two-level multivariable logistic regression modeling.

RESULTS:

Of 142 782 deliveries during the study period, 626 (0.4%) were singletons in breech presentation from 26(0/7) to 29(6/7) weeks of gestation: after exclusions, 130 were in the PVD group and 173 in the PCD group. Severe newborn morbidity was similar in the two groups. Newborn mortality was 12% in the PCD group and 16% in the PVD group. Three neonates (1.7%, 95% CI: 0.34-5.0) died from head entrapment after vaginal delivery in the PVD group. Nonetheless, the policy of PVD was not associated with increased risks of neonatal death (aOR: 1.01, 95% CI: 0.33-2.92) or severe morbidity.

CONCLUSION:

Risks of mortality and severe morbidity in preterm breech were not increased by a policy of vaginal delivery. Head entrapment leading to death is however possible in cases of vaginal delivery but its rarity should be balanced with the maternal consequences of early preterm cesarean delivery.

7.

[Risk factors for preterm delivery: do they add to fetal fibronectin testing and cervical length measurement in the prediction of preterm delivery in symptomatic women?](#)

van Baaren GJ, Bruijn MM, Vis JY, Wilms FF, Oudijk MA, Kwee A, Porath MM, Oei G, Scheepers HC, Spaanderman ME, Bloemenkamp KW, Haak MC, Bolte AC, Bax CJ, Cornette JM, Duvekot JJ, Nij Bijvanck BW, van Eijck J, Franssen MT, Sollie KM, Vandenbussche FP, Woiski M, Bossuyt PM, Opmeer BC, Mol BW.

Abstract

OBJECTIVE:

To assess whether patient characteristics add to the fetal fibronectin test and cervical length measurement in the prediction of preterm delivery in symptomatic women.

STUDY DESIGN:

A nationwide prospective cohort study was conducted in all ten perinatal centres in the Netherlands. Women with symptoms of preterm labour between 24 and 34 weeks gestation with intact membranes were invited. In all women qualitative fibronectin testing (0.050μg/mL cut-off) and cervical length measurement were performed. Only singleton pregnancies were included in this analysis. Logistic regression was used to construct two multivariable models to predict spontaneously delivery within 7 days: a model including cervical length and fetal fibronectin as predictors, and an extended model including all potential predictors. The models were internally validated using bootstrapping techniques. Predictive performances were assessed as the area under the receiver operator characteristic curve (AUC) and calibration plots. We compared the models' capability to identify women with a low risk to deliver within 7 days. A risk less than 5%, corresponding to the risk for women with a cervical length of at least 25mm, was considered as low risk.

RESULTS:

Seventy-three of 600 included women (12%) had delivered spontaneously within 7 days. The extended model included maternal age, parity, previous preterm delivery, vaginal bleeding, C-reactive protein, cervical length, dilatation and fibronectin status. Both models had high discriminative performances (AUC of 0.92 (95% CI 0.88-0.95) and 0.95 (95% CI 0.92-0.97) respectively). Compared to the model with fibronectin and cervical length, our extended model reclassified 38 women (6%) from low risk to high risk and 21 women (4%) from high risk to low risk. Preterm delivery within 7 days occurred once in both the reclassification groups.

CONCLUSION:

In women with symptoms of preterm labour before 34 weeks gestation, a model that integrates maternal characteristics, clinical signs and laboratory tests, did not predict delivery within 7 days better than a model with only fibronectin and cervical length.

8.

First-Trimester Screening for Gestational Diabetes Mellitus Based on Maternal Characteristics and History.

Syngelaki A, Pastides A, Kotecha R, Wright A, Akolekar R, Nicolaides KH.

Abstract

OBJECTIVES:

To develop and validate a prediction model for gestational diabetes mellitus (GDM) at 11-13 weeks' gestation based on maternal characteristics and history and to compare its performance with the method recommended by the National Institute of Health and Care Excellence (NICE) and five other published prediction models.

METHODS:

A predictive logistic regression model for GDM was developed from 1,827 cases (2.4%) who developed GDM and 73,334 unaffected controls. A 5-fold cross-validation study was performed to validate this model and to compare its performance with those of the NICE guidelines and the previously published models.

RESULTS:

In the logistic regression model, maternal age, weight, height, racial origin, family history of diabetes, use of ovulation drugs, birth weight, and previous history of GDM were found to be significant predictors of GDM. In screening for GDM in the 5-fold cross-validation study, detection rates (DRs) were higher (p < 0.0001) for the proposed model (DR = 83.2%) than for the NICE guidelines (DR = 77.5%) for a false positive rate of approximately 40% (determined by NICE). The area under the receiver operating characteristic curve of the new model was higher (p < 0.0001) than that of the previous five models (0.823 vs. 0.688-786).

CONCLUSIONS:

Early effective screening for GDM can be achieved based on maternal characteristics and history. © 2014 S. Karger AG, Basel.

PMID: 25531073

9.

[Accuracy of Predicting Fetal Loss in Twin Pregnancies Using Gestational Age-Dependent Weight Discordance Cut-Offs: Analysis of the STORK Multiple Pregnancy Cohort.](#)

D'Antonio F, Khalil A, Morlando M, Thilaganathan B.

Abstract

OBJECTIVES:

A third-trimester fetal weight discordance of 25% has been proposed as an independent predictor of fetal loss in twin pregnancies. As fetal weight gain at this stage of pregnancy increases exponentially, it is not entirely certain whether a single cut-off for inter-twin weight discordance is appropriate. The aim of this study was to investigate whether a single weight discordance cut-off can be used or whether different cut-offs should be adopted according to the gestational age at assessment.

METHODS:

This was a retrospective study of all twin pregnancies of known chorionicity from a large regional cohort over a 10-year period. Receiver operating characteristic curve and logistic regression analyses were used to explore the relation between estimated fetal weight (EFW) discordance detected within 4 weeks from the occurrence of the outcome and single fetal loss at different gestational age windows.

RESULTS:

957 twin pregnancies (173 monochorionic and 784 dichorionic) were included in the analysis. EFW discordance was independently associated with the occurrence of single fetal loss in twin pregnancies in each gestational age window. Ultrasound EFW discordance had an area under the curve of 0.77 (95% CI: 0.67-0.87) for the prediction of single fetal loss in the third trimester of pregnancy, with an optimal cut-off of around 25% (23.2%). The optimal cut-offs of EFW discordance for the prediction of single fetal loss were different in each gestational age window.

CONCLUSION:

The accuracy of EFW discordance in predicting single fetal loss in twin pregnancies varies during the third trimester of pregnancy. The degree of fetal weight discordance associated with fetal loss decreases during the third trimester, suggesting that the weight discordance threshold for intervention should vary according to gestational age. © 2015 S. Karger AG, Basel.

PMID: 25660975

10.

[Low-Dose versus Standard-Dose Intravenous Immunoglobulin to Prevent Fetal Intracranial Hemorrhage in Fetal and Neonatal Alloimmune Thrombocytopenia: A Randomized Trial.](#)

Paridaans NP, Kamphuis MM, Taune Wikman A, Tiblad E, Van den Akker ES, Lopriore E, Challis D, Westgren M, Oepkes D.

Abstract

OBJECTIVE:

Pregnancies at risk of fetal and neonatal alloimmune thrombocytopenia (FNAIT) are commonly treated using weekly intravenous immunoglobulin (IVIG) at 1 g/kg maternal weight. IVIG is an expensive multidonor human blood product with dose-related side effects. Our aim was to evaluate the effectiveness of IVIG at a lower dose, i.e. 0.5 g/kg.

METHODS:

This was a randomized controlled multicenter trial conducted in Sweden, the Netherlands and Australia. Pregnant women with human platelet antigen alloantibodies and an affected previous child without intracranial hemorrhage (ICH) were enrolled. The participants were

randomized to IVIG at 0.5 or 1 g/kg per week. The analyses were per intention to treat. The primary outcome was fetal or neonatal ICH. Secondary outcomes were platelet count at birth, maternal and neonatal IgG levels, neonatal treatment and bleeding other than ICH.

RESULTS:

A total of 23 women were randomized into two groups (low dose: n = 12; standard dose: n = 11). The trial was stopped early due to poor recruitment. No ICH occurred. The median newborn platelet count was 81 × 10(9)/l (range 8-269) in the 0.5 g/kg group versus 110 × 10(9)/l (range 11-279) in the 1 g/kg group (p = 0.644).

CONCLUSION:

The risk of adverse outcomes in FNAIT pregnancies treated with IVIG at 0.5 g/kg is very low, similar to that using 1 g/kg, although our uncompleted trial lacked the power to conclusively prove the noninferiority of using the low dose. © 2015 S. Karger AG, Basel.

PMID: 25896635

11.

Noninvasive prenatal screening for aneuploidy: positive predictive values based on cytogenetic findings.

Meck JM, Kramer Dugan E, Matyakhina L, Aviram A, Trunca C, Pineda-Alvarez D, Aradhya S, Klein RT, Cherry AM.

Abstract

OBJECTIVE:
We sought to determine the positive predictive value (PPV) of noninvasive prenatal screening (NIPS) for various aneuploidies based on cases referred for follow-up cytogenetic testing. Secondarily, we wanted to determine the false-negative (FN) rate for those cases with a negative NIPS result.

STUDY DESIGN:
We compared the cytogenetic findings (primarily from chromosome analysis) from 216 cases referred to our laboratories with either a positive or negative NIPS result, and classified NIPS results as true positive, false positive, true negative, or FN. Diagnostic cytogenetic testing was performed on the following tissue types: amniotic fluid (n = 137), chorionic villi (n = 69),

neonatal blood (n = 6), and products of conception (n = 4).

RESULTS:
The PPV for NIPS were as follows: 93% for trisomy (T)21 (n = 99; 95% confidence interval [CI], 86-97.1%), 58% for T18 (n = 24; 95% CI, 36.6-77.9%), 45% for T13 (n = 11; 95% CI, 16.7-76.6%), 23% for monosomy X (n = 26; 95% CI, 9-43.6%), and 67% for XXY (n = 6; 95% CI, 22.3-95.7%). Of the 26 cases referred for follow-up cytogenetics after a negative NIPS result, 1 (4%) was FN (T13). Two cases of triploidy, a very serious condition but one not claimed to be detectable by the test providers, were among those classified as true negatives.

CONCLUSION:
T21, which has the highest prevalence of all aneuploidies, demonstrated a high true-positive rate, resulting in a high PPV. However, the other aneuploidies, with their lower prevalence, displayed relatively high false-positive rates and, therefore, lower PPV. Patients and physicians must fully understand the limitations of this screening test and the need in many cases to follow up with appropriate diagnostic testing to obtain an accurate diagnosis.