poster presentations in perinatal genetics

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THE CLINICAL SIGNIFICANCE OF ISOLATED FETAL ECHOGENIC BOWEL. HB Al-Kouatly, ST Chasen, J Streltzoff, FA Chervenak. The New Presbyterian Hospital/Cornell University, New York, NY.

OBJECTIVE: To determine the incidence of aneuploidy, cystic fibrosis (CF), and intrauterine infection with toxoplasmosis and cytomegalovirus (CMV) in second-trimester fetuses with the sonographic finding of isolated echogenic bowel.

STUDY DESIGN: All cases of echogenic bowel diagnosed in our ultrasound unit from 1993-1999 were reviewed. Only cases in which echogenicity was as bright as bone were included. Cases with associated fetal anomalies diagnosed with ultrasound were excluded. Echogenicity was classified as focal or multifocal.

RESULTS: Echogenic bowel was diagnosed in 250 patients during the study period. The study is limited to the 180 patients who were receiving prenatal care at our hospital. To date, follow-up has been obtained on 104 patients with isolated fetal echogenic bowel. The mean gestational age at diagnosis was 18.6 ± 2.1 weeks (range 14-24 weeks) and the mean maternal age was 32.1 ± 5.9 years (range 15-47 years). CF mutations were identified in 6 of 79 (7.6%) mothers and 5 of 58 (8.6%) fathers who were tested. Follow-up is available for 5 of 8 pregnancies in which at least one parent was found to carry a CF mutation. Three fetuses were affected with CF and one was found to be a carrier. Parents of affected fetuses were not known carriers prior to the diagnosis of echogenic bowel. Fetal karyotype was obtained in 87 cases and autosomal trisomy was diagnosed in 3 (3.4%). One fetus was infected with CMV demonstrated by maternal serology and inclusion bodies characteristic of CMV infection in the autopsy specimen. In all cases of CF and aneuploidy, echogenicity was multifocal; in the case of CMV, echogenicity was focal.

CONCLUSION: Serious conditions were diagnosed in 7 out of 104 patients with isolated echogenic bowel: cystic fibrosis 3, autosomal trisomy 3, and CMV infection 1. There was a multifocal pattern of echogenicity in CF affected and trisomic fetuses.

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Is an elevated maternal serum uE_3 MoM value in the second trimester associated with a poor pregnancy outcome? S.A. Aufox[1], M.N. Berry[1], D. Conrad[1], T.H. Stamper[1], and P.S. Hart[2] [1]Wake Forest Univ. School of Medicine, Winston-Salem, NC, [2]Univ. of Pittsburgh, Pittsburgh, PA.

OBJECTIVE: To determine if a maternal serum uE_3 value ≥ 5.00 multiples of the median (MoM) is a useful predictor of a poor pregnancy outcome. METHODS: Between 11/1/93 & 6/1/99, 78,575 women underwent 2nd trimester maternal serum screening using alpha fetoprotein (AFP), human chorionic gonadotropin (hCG) and unconjugated estriol (uE_3) levels. After eliminating women who had an increased risk for Down syndrome, open neural tube defects, or Trisomy 18 from the study population, 58 women were identified with an uE_3 value ≥ 5.00 MoM. Of these 58 women, 28 women were of more advanced gestational age and 5 women were found to be carrying a multiple gestation. Of the remaining 25 women, 11 women with a maternal serum uE_3 value ≥ 5.00 MoM had a normal pregnancy and outcome. Four women were lost to follow-up. Ten women were found to have an abnormal outcome. Abnormal outcomes included preterm delivery (≤ 37 weeks gestation) (n=7), fetal demise (n=2), and birth defects noted at delivery (n=1). The 10 women with abnormal outcomes were matched for race, gestation, and date of screening with women who had a normal 2nd trimester maternal serum screen. A relative risk (RR) for pregnancy complications was determined. RESULTS: A maternal serum uE_3 value ≥ 5.00 MoM was associated with a poor pregnancy outcome (RR 53.6 [confidence interval 6.2-463] with a $p<0.0001$). CONCLUSIONS: Although our sample size is small, maternal serum uE_3 values ≥ 5.00 MoM in the 2nd trimester appear to be associated with an increased risk for a poor pregnancy outcome. Due to the limited number of cases reported, this association between an uE_3 MoM value ≥ 5.00 and poor pregnancy outcome warrants further investigation.

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Prenatal diagnosis of otocephaly. R.Brewer, R.Dykhuizen, J. Sumners. Center for Prenatal Diagnosis, Indianapolis, IN

A 23 year old G3P2 white female was referred following a routine ultrasound at 22 weeks gestation revealing facial anomalies. The patient's history includes a three-year-old daughter with autism and a congenital heart defect and a one-year-old son born with anophthalmia of the right eye and microphthalmia of the left eye, resulting in bilateral blindness. Both children were born to different fathers. A detailed ultrasound performed at 22 weeks gestation, confirmed absence of mandible, a mid-facial protuberance, a multicystic, dysplastic right kidney and polyhydramnios. These results were consistent with otocephaly. The patient's history raised concern for a pattern of inheritable defects in this family; therefore, an amniocentesis was performed at 22 weeks gestation. Chromosome results were 46,XY. Following the ultrasound findings, a thorough discussion of otocephaly with extensive genetic counseling ensued, and the patient requested an early induction of labor. Due to the lethality of otocephaly, the pediatric ethics committee at Methodist hospital met and granted permission for an early induction of labor at 23 weeks gestation. Patient delivered a 594 gram fetus. Autopsy examination confirmed the diagnosis of otocephaly. No definite mandible was identified by dissection or fetal x-ray. A protuberance on the lower mid-face was present with a small midline skin dimple. The nose was situated on the upper aspect of the protuberance with patent external nares, but no patent choanae were found. No patent mouth opening, oral cavity or normal tongue was identified. Extremely low-set ears nearly met in the anterior midline of the neck, below the protuberance. The eyes were low-set with down-slanting palpebral fissures. The right lid was fused, and the left was partially open. No cardiovascular or other significant gross abnormalities were present. Otocephaly is a rare developmental field defect of the face and neck with an approximate prevalence of 1/70,000. This condition is lethal due to insufficient airway function caused by agnathia. The etiology of otocephaly is heterogenous and is possibly caused by migration defects of the neural crest or by defects in the interaction of these cells with the mesoderm. This condition can be associated with cardiac, pulmonary, esophageal and/or renal anomalies. Due to this patient's history, an extensive genetic evaluation is recommended for this family.

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Prune belly syndrome in a patient with only a mildly distended bladder. R. Brewer, M. Menzel, J Sumners. Center for Prenatal Diagnosis, Indianapolis, IN

A 19-year-old G3P1AB1 Caucasian female was referred to us at 14 weeks gestation for oligohydramnios and fetal megacytis. Transabdominal CVS was performed at 15 weeks for rapid chromosomes. Chromosome results were completed two days later, revealing a 46, XY normal male karyotype. A 16-week ultrasound demonstrated anhydramnios, an enlarged fetal bladder and a large amount of fetal ascites. A vesicoamniotic shunt was placed at 16 weeks gestation, and a second shunt was placed at 17 weeks gestation after severe oligohydramnios, megacytis, and fetal ascitis was again noted on ultrasound. A third shunt was placed two days later when the second shunt was presumably not functioning. Follow-up ultrasounds were performed every 3-4 days for the following three weeks, and then monthly to monitor fetal bladder dilation and amniotic fluid volume. Bladder size was consistently mildly enlarged, and amniotic fluid volume was mildly decreased. A lung maturity amniocentesis was performed at 35.8 weeks gestation when oligohydramnios was present. Labor was induced the same day. The patient delivered a male infant with APGAR's of 7 and 9. The infant was transferred to the NICU for close observation. Neither the patient nor the infant exhibited any complications following delivery. The infant boy was subsequently diagnosed with Prune-Belly syndrome, which consists of a triad of anomalies: deficient abdominal wall musculature, urinary tract dilatation, and cryptorchidism. There are two opposing theories regarding the pathogenesis of Prune-Belly syndrome. The first is that the primary defect is a urethral obstruction, causing distention of the bladder, which prevents access of the testes to the inguinal canal, and leads to abdominal distention and subsequent degeneration of the abdominal muscles. The second theory is that the primary defect is in the distribution or quality of the mesoderm, resulting from an insult to the embryonic mesoderm which affects the developing urinary tract, renal and prostatic primordia, and the muscles of the abdominal wall. According to this theory, a urinary tract obstruction could occur as a result of this early defect in the mesoderm. Our case supports the latter theory given the fact that the bladder was only minimally enlarged throughout gestation, and therefore would not appear to explain the clinical presentation of prune belly sequence in our patient.