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Neonatal outcomes associated with intestinal abnormalities diagnosed by fetal ultrasound

Melissa J. Ruiz[a], Keith A. Thatch[a], Jason C. Fisher[a], Lynn L. Simpson[b,c], Robert A. Cowles[a,*]

[a]*Division of Pediatric Surgery, Morgan Stanley Children's Hospital of New York-Presbyterian and Columbia University College of Physicians and Surgeons, New York, NY 10032, USA*
[b]*Maternal Fetal Medicine, Morgan Stanley Children's Hospital of New York-Presbyterian and Columbia University College of Physicians and Surgeons, New York, NY 10032, USA*
[c]*Center for Prenatal Pediatrics, Morgan Stanley Children's Hospital of New York-Presbyterian and Columbia University College of Physicians and Surgeons, New York, NY 10032, USA*

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Abstract

Purpose: Intestinal abnormalities are sometimes seen during antenatal testing; however, the postnatal importance of these findings has not been well established. We evaluated whether abnormal intestinal appearance on fetal ultrasound (US) was ultimately related to neonatal outcome.

Methods: Fetal US examinations from 2003 to 2006 were evaluated. Hyperechogenic bowel was defined as having the echogenicity comparable to bone, and dilated bowel was identified based on the sonographer's assessment. Persistence or resolution of US findings on subsequent US examinations and eventual outcomes were assessed. Cases were categorized as hyperechogenic or dilated and then subgrouped based on whether the US finding resolved.

Results: Sixty-eight fetuses had either hyperechogenic (n = 48) or dilated bowel (n = 20) on antenatal US. In 56 cases, complete data were available for analysis. Of 44 liveborn infants, 11 (25.0%) had an abdominal abnormality, and 33 (75.0%) were normal at birth. Compared to those with dilated bowel, fetuses with hyperechogenic bowel had a higher rate of prenatal demise (20.8% vs 10%) but a lower rate of abnormality at birth (10.3% vs 53.3%). Hyperechogenic bowel resolved on subsequent US more frequently than dilated bowel (65.5% vs 20.0%). In both groups, all fetuses with sonographic resolution were normal at birth. Of 9 fetuses that had persistently hyperechogenic bowel, 3 (33.3%) were born with an abnormality, and all were found to have meconium peritonitis or meconium ileus. In the 12 cases where dilated bowel did not resolve, 8 (66.7%) were eventually born with an abnormality, most commonly intestinal atresia.

Conclusions: Hyperechogenic and dilated bowel are associated with a significant rate of fetal demise. Hyperechogenicity is more common than dilation and is more likely to be transient. Dilated bowel is

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* Corresponding author. Tel.: +212 342 8585; fax: +212 305 9270.
E-mail address: rc2114@columbia.edu (R.A. Cowles).

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more often associated with neonatal abnormality than hyperechogenic bowel. Persistence of fetal US findings predicts a higher likelihood of abnormality in the neonate.

Improvements in antenatal ultrasound (US) have resulted in more frequent detection of many conditions affecting the unborn fetus. Although the gastrointestinal tract is not easily examined in detail during these antenatal examinations, the presence of hyperechogenic bowel (HB) or dilated bowel (DB) can be ascertained sonographically. The long-term significance of these antenatal findings remains unclear. Some authors suggest that HB may be a normal finding in some cases [1], whereas others have shown that there is a significantly increased risk of adverse outcome [2-5]. Similarly, the antenatal US finding of DB has also been questioned in terms of its ability to reliably predict postnatal outcome [6]. The current study was undertaken to assess the frequency of postnatal abnormalities in children who were noted to have abnormal intestinal findings on antenatal US. We hypothesized that most children who were suspected of having a congenital intestinal abnormality would actually have a normal outcome.

1. Methods

Results of fetal US examinations performed between 2003 and 2006 were obtained from the records of The Center for Prenatal Pediatrics at Columbia University Medical Center. These records that were reviewed for mention of intestinal abnormalities and fetuses that were noted to have either HB or DB were studied in detail. Hyperechogenic bowel was defined as having sonographic echogenicity similar to bone, whereas the presence of DB was determined based on measurements and qualitative assessment by the sonographer. Cases where DB was suspected to represent duodenal atresia were purposefully omitted. Persistence or resolution of abnormal sonographic findings over time and postnatal diagnoses was tracked. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS 15.0; SPSS, Chicago, IL). Groups were compared using the Mann-Whitney U test or the Fisher exact test. Statistical significance was assumed at $P < .05$. This study was reviewed and approved by the Institutional Review Board of Columbia University (Protocol #IRB-AAAB9498).

2. Results

Sixty-eight fetuses were identified as having either HB (Fig. 1) or DB (Fig. 2). Outcomes of these pregnancies are shown in Table 1. Fetuses were divided into 2 groups based on the results of prenatal US, 1 group with HB (n = 48) and 1 group with DB (n = 20). In these 68 fetuses, the prenatal sonographic diagnosis was made at a mean of 22.8 weeks

Fig. 1 Fetus with HB appearing as a bright area in the lower abdomen (right of screen).

Fig. 2 Fetus with prominently DB in the abdominal cavity.