



Effect of delivery approach on outcomes in fetuses with gastroschisis

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Abstract

Background/Purpose: There is considerable controversy regarding optimal mode and timing of delivery for fetuses with gastroschisis. Our objectives were to describe the variation in institutional approach regarding these factors, and to evaluate the effect of timing of delivery on outcomes in fetuses with gastroschisis.

Methods: Members of the maternal–fetal medicine community across Canada were surveyed regarding their personal and institutional approach of delivery. Data from the Canadian Pediatric Surgery Network (CAPSnet) were analyzed.

Results: The survey showed significant variability in delivery approach between institutions, although no center routinely performs cesarean section. Infants delivered vaginally (VD) were categorized into three groups: Group 1, VD <36 weeks ($n = 114$); Group 2, VD 36–37 weeks ($n = 218$); and Group 3, VD ≥ 38 weeks ($n = 75$). Score of Neonatal Acute Physiology, complication rates, length of time on total parenteral nutrition (TPN), and length of hospital stay (LOS) were higher in Group 1; bowel matting was greater in Group 3. There were no differences between the groups regarding other complications.

Conclusions: Our data suggest that preterm delivery was associated with more complications, longer time on TPN, and longer LOS; delivery ≥ 38 weeks was associated with increased bowel matting. These outcomes should be considered when determining institutional protocol.

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Although survival in gastroschisis exceeds 90%, morbidity in survivors may be substantial. Even survivors with excellent outcomes consume a disproportionate share of resources when compared with other neonatal intensive care unit patient groups [1]. Perinatal treatment strategies thought to have the greatest potential for outcome improvement include timing (gestational age) and mode (vaginal vs

cesarean) of delivery. Although these factors have been extensively studied, the controversy persists [2–5].

Some believe that prolonged contact of the exposed bowel to amniotic fluid increases intestinal wall edema and results in prolonged intestinal dysfunction in addition to the recognized increased risk of fetal distress and late death [2–7]. This has led to the rationale that earlier delivery of the fetus with gastroschisis, particularly when bowel is dilated or thickened, may ameliorate the intestinal damage and thus promote earlier recovery of gut function in the neonate [8]. Other authors have rejected this concept [9–12].

Our objectives in this study were to describe variation in approach regarding timing and mode of delivery of fetuses with gastroschisis among Canadian centers, and to estimate the effects of those philosophies on outcomes using population-based data.

1. Methods

Research ethics board approval was obtained before any study data were collected.

1.1. Survey

All maternal–fetal medicine (MFM) specialist members of the Society of Obstetricians and Gynaecologists of Canada (SOGC) were sent a survey via e-mail regarding both their individual and institutional practice with respect to delivery of fetuses with gastroschisis. A follow-up e-mail was sent 1 week later to nonresponders. Members were asked to complete the survey online. Survey participants were also allowed to enter a text description of delivery approach.

1.2. CAPSNet data

This was a population-based study consisting of a retrospective review of prospectively collected data. Data were obtained from the Canadian Pediatric Surgery Network (CAPSNet), a multidisciplinary group of Canadian health researchers covering all 18 tertiary perinatal centers in Canada. In addition to pediatric surgeons, group members extended to other disciplines including neonatology, perinatology, and medical genetics. The database includes all infants born with gastroschisis and managed at one of the CAPSNet centers between 2005 and 2010. Only infants for whom an antenatal diagnosis was made were included in this study.

The Student *t* test was used to compare differences in means between groups and χ^2 was used to assess the differences in proportions between groups. In order to satisfy the prerequisite assumptions of normality, continuous outcome variables exhibiting a skewed distribution were transformed, using the natural logarithms, before *t* tests were conducted.

2. Results

2.1. Survey results

Survey questions were sent to all 90 MFM specialists in Canada. There were 61 responders (68%) with at least 2 responders from each institution.

The following is a summary of the survey results (Fig. 1):

- 23% do not intervene until onset of labor.
- 52% induce labor between 36 and 38 weeks.
- 25% induce labor at 38 weeks.
- None perform routine cesarean section in the absence of obstetrical indications.

In a separate question 18% of the responders stated differing delivery approaches among members of the same institution.

2.2. CAPSNet data results

A total of 630 infants with prenatally diagnosed gastroschisis were included in the CAPSNet database. Cesarean section was performed in 223 (35%), and 407 were delivered vaginally. As none of the Canadian MFM specialists who responded to the survey indicated that they performed routine cesarean section, we excluded infants delivered via this method, assuming that confounding obstetrical indications were present.

Infants delivered vaginally were categorized into three groups:

- Group 1: VD < 36 weeks (*n* = 114)
- Group 2: VD 36–37 weeks (*n* = 218)
- Group 3: VD ≥ 38 weeks (*n* = 75)

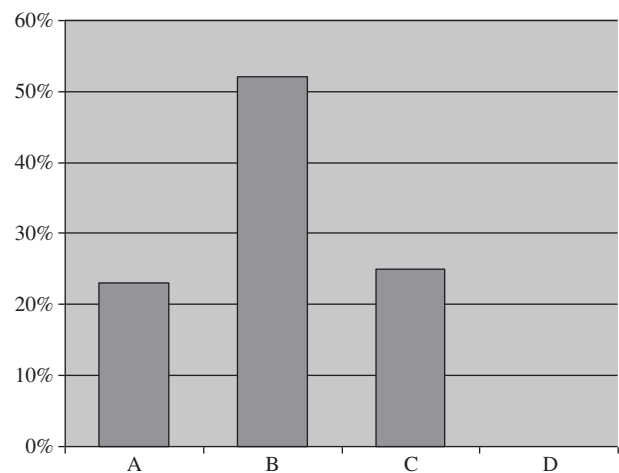


Fig. 1 The percentage of survey respondents utilizing each delivery method: A = no intervention, B = induction at 36–37 weeks, C = induction at 38 weeks, D = routine cesarean section.

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