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Exposure to prenatal consultation during pediatric surgery residency: Implications for training

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ABSTRACT

Purpose: Prenatal consultation is an important skill that should be learned during pediatric surgery training, but there are no formal guidelines for fellowship programs at this time. We sought to characterize the fellowship experience of recent pediatric surgery graduates and assess preparedness for providing prenatal consultation.
Methods: An anonymous online survey of pediatric surgery fellows graduating in 2012 and 2013 was performed. We asked respondents to describe participation in prenatal consultation and preparedness to perform consultation. We measured demographics and fellowship characteristics and tested associations between these variables and preparedness to perform prenatal consultation.
Results: A total of 49 out of 80 fellows responded to the survey (61% response rate). Most respondents (55%) saw five or fewer prenatal consults during fellowship, and 20% had not seen any prenatal consults. 47% said that fellowship could have better prepared them to perform prenatal consults. Fellows who saw more than 5 prenatal consults during fellowship (33% vs 77%, $p = 0.002$) or described their fellowship as being structured to facilitate participation in prenatal consults (83% vs 27%, $p < 0.0001$) were more likely to feel prepared. Stepwise logistic regression revealed that after adjusting for covariates, fellows graduating from programs that were 1) structured to facilitate participation in prenatal consults (OR 18, 95% CI 3.7–86.7), or 2) did NOT have an established fetal program (OR 5.5, 95% CI 1.1–27.8) were more likely to feel prepared.
Conclusion: Exposure to prenatal consultation varies greatly across pediatric surgery fellowships, and many recent graduates do not feel prepared to perform prenatal consultation. The presence of an established fetal program did not necessarily translate into improved fellow training. Efforts should be made to standardize the approach to fellow education in this area and ensure that adequate guidance and resources are available to recently graduated pediatric surgeons.

Pediatric surgeons play an essential role in prenatal consultation for fetuses with certain congenital anomalies. Understanding the surgical perspective is crucial in order for prospective parents to fully appreciate the significance of a prenatal diagnosis and make important decisions ranging from where and how the baby will be delivered to considering an in utero intervention or even terminating the pregnancy [1,2]. It is critical that pediatric surgeons, upon completion of their training, be able to competently provide evidence-based information to future parents and set up realistic expectations as to how this anomaly will impact the life of their future child.

Pediatric surgery residency training is typically a fast-paced two-year period with emphasis placed on operative skills and hands-on inpatient care. Outpatient and clinic exposure, which is already limited, tends to focus on "bread-and-butter" pediatric surgical pathology. In order to graduate from pediatric surgery residency and become board-eligible, fellows have strict requirements in terms of operative cases completed and trauma patients cared for. However, there are no specific guidelines with respect to outpatient activities, including participation in prenatal counseling [3]. The objective of this study was to characterize exposure to prenatal consultation during pediatric surgery residency and assess fellows' comfort level with this important skill.

1. Methods

1.1. Study design and sample

An anonymous cross-sectional survey was conducted online using SurveyMonkey® (www.surveymonkey.com). We surveyed fellows graduating from pediatric surgery residency programs in the United States and Canada in 2012 and 2013. The survey was developed and pilot-tested on five recently graduated pediatric surgery fellows,

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revised, and then distributed by e-mail (see Appendix A). All research procedures were approved by the Institutional Review Boards at Nemours and the Lurie Children's Hospital.

1.2. Survey measures

The survey collected demographics, current (post-fellowship) practice setting, and fellowship characteristics. These specifically included features relevant to prenatal consultation experience such as presence of a fetal diagnosis and treatment program and participation in a multidisciplinary fetal conference. We quantified the number of prenatal consults seen during fellowship overall, and for the following diagnoses: congenital diaphragmatic hernia (CDH), congenital lung mass, sacrococcygeal teratoma (SCT), abdominal wall defect (AWD), dilated bowel/atresia, and abdominal cyst. We asked about the number of operative cases performed by fellows for the same list of diagnoses. Finally, we measured fellows' comfort level to perform prenatal consultations independently for each diagnosis and asked how the residency could have better prepared them to perform prenatal consultations. Answer choices were a combination of Likert scales (e.g., 1 through 5 where 1 = "not at all comfortable" and 5 = "very comfortable") and categorical numerical choices (e.g., number of prenatal consultations for a given diagnosis). The survey also included open-ended questions in order to better understand why fellows did or did not feel prepared to perform prenatal consultations at the end of fellowship. We asked respondents what resources they currently use to guide them in performing prenatal consultations, and to describe deficits in the available resources.

1.3. Data analysis

We performed standard frequency analyses to describe the study sample and responses to survey questions. We dichotomized Likert scale responses into "comfortable independently performing prenatal consultation for a diagnosis" ("5") or not (less than "5"). In order to examine associations between fellow and residency program characteristics and likelihood of feeling prepared, we performed bivariate analyses using the chi square test. To identify independent predictors of feeling prepared after adjusting for covariates, we used multivariable logistic regression. All quantitative statistical analyses were performed using the SAS Enterprise Guide (SAS Institute, Cary, NC).

Open-ended responses were analyzed in order to characterize fellows' opinions regarding how their training could have better prepared them to perform prenatal consultations. Two of the authors with experience in qualitative research (L.B., A.K.) analyzed qualitative data using the constant comparative method, a systematic data coding and analysis procedure [4,5]. This method involves the categorization of specific quotes from participants with the use of codes developed iteratively to reflect the data. We focused our analysis on those aspects of the qualitative data that would enhance our interpretation of the quantitative findings and provide additional insights into perceptions and experiences not measured quantitatively [6].

2. Results

2.1. Description of sample and training programs (Table 1)

A total of 49 pediatric surgeons responded out of 80 who were contacted (response rate 61%). Most respondents were male and Caucasian. The vast majority described their current practice setting as academic practice and stated that they were currently participating in prenatal consultation as attendings. Most respondents trained in larger programs, with six or more attending pediatric surgeons. The majority (65.2%) described their training programs as having established fetal programs (11 respondents categorized this program as a fetal diagnosis and counseling program, while 21 described it as a diagnosis and therapy program). Most respondents (83.7%) had attended neonatal resuscitations of newborns with pediatric surgical congenital anomalies, and 33.0% had observed fetal surgical procedures.

Table 1
Participant and residency program characteristics.

Characteristics of participants	
Sex	N (%)
Male	28 (57.1)
Female	21 (42.9)
Race	
White	37 (77.1)
Black	2 (4.2)
Asian	7 (14.6)
Other	2 (4.2)
Year graduated from fellowship	
2012	21 (42.9)
2013	28 (57.1)
Current practice setting	
Private practice	7 (14.3)
Academic practice	39 (79.6)
Other	3 (6.1)
Currently participating in prenatal consultation?	
Yes	45 (90.0)
No	5 (10.0)
Characteristics of training programs as described by participants	**N (%) answering "Yes"**
Established fetal program?	32 (65.2)
Number pediatric surgeons in training program?	
1 to 5	15 (30.6)
6 to 10	23 (46.9)
11 to 15	7 (14.3)
>15	4 (8.2)
Observed fetal surgical procedures?	16 (32.7)
Attended neonatal resuscitation of newborns with pediatric surgical congenital anomalies?	41 (83.7)
Multidisciplinary fetal diagnosis and treatment conference held monthly or more often?	36 (73.4)
Regularly attended this conference?	11 (22.5)
Center performed fetal MRI?	42 (89.4)
Pediatric surgeons reviewed fetal MRI with patients?	33 (67.4)
Fellowship was structured to facilitate prenatal consultation?	23 (46.9)
Fellowship could have better prepared you to perform prenatal consultation?	23 (46.9)

2.2. Frequency of prenatal consultation participation and preparedness

The majority of respondents (54.1%) participated in five or fewer prenatal consultations during their pediatric surgery residency. Most fellows saw at least one prenatal consult for CDH and AWD. The diagnoses for which participants were least likely to have performed prenatal consultation were as follows: 68% of fellows saw no prenatal consults for SCT, 56% of fellows saw no consults for abdominal cyst, 45% for dilated bowel/atresia, and 40% for lung masses. Ten fellows (20%) did not participate in any prenatal consults during their entire training period (Fig. 1). This is in stark contrast to fellows' operative experience, as the vast majority performed at least five operative cases for each of the diagnoses (with the exception of SCT) while many fellows did not participate in more than one prenatal consult for that diagnosis (Fig. 2). In fact, 31 respondents (63.2%) reported that they had rarely or never participated in the prenatal consult when taking care of a neonate whose mother had been seen prenatally.

Overall, nearly half of the respondents (47%) stated that pediatric surgery residency could have better prepared them to perform prenatal consultation. Abdominal wall defects were the only diagnosis for which the majority of fellows reported that they felt comfortable independently conducting prenatal consultation (Fig. 3). In terms of current preparation strategies for performing prenatal consultations, 90% use a textbook, 80% speak to colleagues, 71% use journal articles, and 41% use the American Pediatric Surgical Association (APSA) handbook [7]. We asked about several different modalities of resources and whether