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Cesarean Delivery Management of Stillbirth: In-Depth Analysis of 75 Cases in a Rural State

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Abstract

Objective: To analyze the characteristics surrounding women who underwent cesarean delivery for stillbirth management in the rural, southern US state of Arkansas.

Methods: This was a planned secondary analysis of a retrospective descriptive study evaluating mode of delivery following the stillbirth of singleton pregnancies without anomalies or aneuploidy delivered in our state between July 2015 and June 2019. Data were extracted from a statewide reproductive health monitoring system and reviewed by the first three authors. Summary statistics were presented as means and standard deviations for continuous measures and frequencies and percentages for categorical variables.

Results: There were 861 patients diagnosed as having stillbirth between July 2015 and June 2019 in 44 hospitals in Arkansas. Seventy-five of those patients (8.7%) underwent cesarean delivery and are the basis for this analysis. Common indications for cesarean delivery were prior cesarean delivery (41%), malpresentation (18.7%), and abruption or hemorrhage (13.1%). Sixty-five percent of patients had a prior cesarean delivery. The most common complications were infection and hemorrhage, which accounted for 64.3% of known complications. The overall complication rate was 18.7% among stillbirths delivered via cesarean.

Conclusions: This study demonstrates that cesarean delivery remains a common mode of delivery for management of stillbirth and that there is maternal morbidity associated with an abdominal delivery because 22.7% of the women undergoing a cesarean had an operative complication. It also highlights that prior cesarean delivery remains a common indication for a repeat abdominal delivery following a stillbirth despite the lack of fetal benefit.

Brief Description

In a planned, separate analysis of a retrospective study examining stillbirth management in the authors' rural state over 4 years, we found a cesarean delivery rate of 8.7% (75/861).

Prior cesarean delivery remains a common indication for cesarean delivery without fetal benefit

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following stillbirth and was an indication in 41% of cases. In addition, cesarean delivery following stillbirth is associated with maternal morbidity because there was an operative complication in 22.7% of patients.

Keywords

cesarean delivery; management; mode of delivery; pregnancy; stillbirth

The current recommendation from the Society for Maternal-Fetal Medicine and the American College of Obstetricians and Gynecologists (ACOG) regarding mode of delivery after a stillbirth is that vaginal delivery is preferred and cesarean delivery should be reserved for extenuating circumstances, especially if demise occurs before 28 weeks' gestation.¹ Factors that influence the management of stillbirth include gestational age at demise, suspected etiology, maternal characteristics and history, prior uterine scar, and maternal and provider preference.^{1,2} Despite this recommendation, ~10% of stillbirths are delivered via cesarean delivery.³ Our prior analysis of 861 stillbirths in our rural, southern US state found a statewide cesarean delivery rate of 8.7% (75/861). We found that the risk of cesarean delivery was greater in low-volume hospitals, defined as an annual volume of <1000 deliveries or in hospitals without graduate medical education programs.

The purpose of this study was to analyze the characteristics surrounding the 75 women who underwent cesarean delivery for stillbirth management between July 2015 and June 2019 in Arkansas.

Methods

This was a planned secondary analysis of a retrospective descriptive study evaluating the mode of delivery following stillbirth of singleton pregnancies without anomalies or aneuploidy delivered in our rural state during the study time period. Stillbirth was defined by the state's Vital Statistics Act with a gestational age criteria of ≥ 20 weeks or fetal weight of ≥ 500 g if the gestational age was unknown.⁴ Data were extracted from a statewide reproductive health monitoring system in which health information specialists extract data from hospital records from reported *International Classification of Diseases, Tenth Revision, Clinical Modification* stillbirth, intrauterine death, and spontaneous abortions codes; fetal death records from the state health department; and the university-based tele-ultrasound system. All received medical records were reviewed by three investigators (A.M.R., J.R.W., and E.F.M.). This study was approved by the university institutional review board.

Study Variables

Variables collected included maternal age, gravidity, parity, gestational age at diagnosis of stillbirth and delivery, birth weight, race and ethnicity, history of substance use during pregnancy, whether genetic testing was performed postnatally, history of cesarean delivery, hysterotomy type, indication for the cesarean, and whether sterilization was performed at the time of cesarean delivery. Peripartum and surgical complications also were recorded.

Statistical Analyses

Summary statistics were presented as means and standard deviations for continuous measures and frequencies and percentages for categorical variables.

Results

There were 861 patients diagnosed as having had stillbirth between July 2015 and June 2019 in 44 hospitals in Arkansas. Seventy-five of those patients (8.7%) underwent cesarean delivery. Table 1 describes the maternal demographics and characteristics for stillbirths delivered by cesarean. The mean gestational age was 34 weeks, with a mean maternal age of 29.5 years. Sixty-five percent of patients had a prior cesarean delivery. Table 2 is a summary of the indications for cesarean delivery listed in the operative report. Common indications for cesarean delivery were prior cesarean delivery (41%), malpresentation (18.7%), and abruption or hemorrhage (13.1%). The most common malpresentation was breech, with 5 of the 14 presenting this way. Transverse presentation was listed as an indication in 4 patients, with 1 delivered via cesarean for a fetus in transverse presentation with an arm prolapsing through the cervix (Table 2). A sterilization procedure at the time of cesarean delivery was performed in 5 cases (6.7%) and was listed as the indication for cesarean delivery in 2 patients.

There were 8 patients (10.6%) who underwent cesarean delivery for stillbirth before 28 weeks gestation, with 7 of those patients having a history of cesarean delivery. Prior cesarean delivery was the most common listed indication for women delivering by cesarean before 28 weeks' gestation. Other indications included arrest of dilation, placenta previa, fetal demise alone, and abruption or hemorrhage.

Complications were extracted from the operative reports or limited medical records. They included uterine infection; blood loss morbidity, including hemorrhage, transfusion, or coagulopathy; postoperative ileus; uterine dehiscence; and hysterotomy extension. The most common complications were infection and hemorrhage, which accounted for 64.3% of the known complications. There was one patient who underwent cesarean delivery at the time of exploratory laparotomy for splenic aneurysm rupture. The overall complication rate was 18.7% among stillbirths delivered via cesarean. Table 3 is a summary of complications surrounding cesarean delivery for stillbirth.

Discussion

The overall, statewide cesarean delivery rate for stillbirths was 8.7% during the study period, which is lower than has been reported previously.⁵ Our study confirms that a prior cesarean delivery remains a common indication for a repeat abdominal delivery following a stillbirth despite the lack of fetal benefit.⁶ Prior cesarean was the indication listed in 41% of patients who underwent cesarean delivery for the management of stillbirth, which is similar to that reported by Boyle et al.⁶ We were unable to calculate the relative risk for cesarean delivery if the patient had a prior cesarean delivery because we did not have surgical history information for those who delivered vaginally, nor did we have the vaginal birth after cesarean delivery rate. This uncovers the need for a statewide quality improvement

endeavor to increase offering a trial of labor after cesarean in the setting of stillbirth because vaginal delivery is the preferred mode of delivery unless surgical delivery benefits outweigh maternal risk.^{1,3} Suspected or impending uterine rupture, maternal contraindications to a vaginal delivery, abnormal placentation, labor dystocia, and transverse lie are clinical scenarios in which cesarean delivery may be indicated.³ In addition, worsening maternal status in which delivery is not imminent such as in preeclampsia with severe features may necessitate cesarean delivery following stillbirth to prevent further deterioration.³

Malpresentation was the second most common indication for cesarean delivery in our study; however, malpresentation is not specifically discussed in the ACOG stillbirth management guidelines nor in the contemporary stillbirth literature, leaving the obstetrician with little guidance in this clinical scenario.^{1-3,6-8} External cephalic version with vaginal delivery and cesarean delivery are options for management in pregnant women with a live fetus and malpresentation.^{7,8} ACOG recommends that external cephalic version be discussed with patients who have singleton pregnancies with breech presentation near term and that planned breech vaginal delivery of a singleton live fetus be reserved for institutions with appropriate protocols and experienced obstetricians because of the concern for higher morbidity and mortality with breech vaginal delivery.^{7,8} With a breech stillbirth, fetal risk is eliminated, leaving only maternal benefit with vaginal delivery. This, therefore, should be the preferred mode of delivery for a breech stillbirth unless there are other contraindications within the clinical scenario. The most common type of malpresentation was breech (5/14 or 35.7%) in our study, which highlights a potential area for education and improvement in our state.

Transverse presentation was the second most common type of malpresentation in our study and is recognized as a potential indication for cesarean delivery with stillbirth.³ Attempting an external version to breech or cephalic presentation is without fetal risk and may provide significant maternal benefit, however. In one patient with transverse presentation, a fetal arm had prolapsed through the cervix, which may have complicated the ability to perform a version at the time of admission. There was one demise of a twin at 22 weeks' gestation with delivery of the pregnancy at 39 weeks' gestation; cesarean delivery was performed for malpresentation in this case, which we recognize as a rather different clinical scenario given the remaining live twin. Because of the retrospective nature of this study and ability to only review records, we were unable to determine whether version or breech vaginal delivery was discussed or whether patients declined the procedure when malpresentation was present.

Maternal morbidity and complications are higher with cesarean delivery compared to vaginal delivery and stillbirth eliminates fetal risk, leaving maternal factors as the primary focus.^{1,9} In addition, hysterotomy presence and type has an impact on future pregnancies because of the increased morbidity related to factors such as adhesions, abnormal placentation, and increased blood loss.⁹⁻¹¹ Quality measures for maternal morbidity and complications also are difficult to track because of the lack of uniform reporting; historically, quality was measured by maternal and neonatal mortality.¹¹ In a retrospective review of severe morbidity and complication rates in Illinois, Roy et al found that the complication rate with cesarean delivery was 14.66%, which is higher than the 10% complication rate that Asch et al reported.^{11,12} Our complication rate of 18.7% is even higher and in a scenario in which there is no fetal benefit to cesarean delivery.

One strength of our study is that it was a statewide analysis including rural, urban, and academic hospitals around the state, which allowed the analysis of a wide range of hospitals providing obstetric care. Also, the database is comprehensive in terms of the number of stillbirths because hospital reporting of all stillbirths is mandated by the state.

The limitations of this study are predominantly related to the retrospective design and availability of information in the records provided. Although reporting all stillbirths by each hospital is required by the state, the information and medical records submitted are not uniform. Hospital resources and offering trial of labor after cesarean may affect decision making regarding mode of delivery following stillbirth, and we were unable to analyze this. Finally, shared decision making is commonly used between patients with stillbirth and their obstetricians; we were unable to analyze the impact of those conversations and the decision-making process on mode of delivery.

This study highlights that cesarean delivery remains a common mode of delivery for the management of stillbirth and that there is maternal morbidity associated with an abdominal delivery because 18.7% of the women undergoing a cesarean had an operative complication. It also highlights an area of quality improvement within our state to increase the offering of trial of labor after cesarean in the setting of stillbirth and prior hysterotomy as well as offering breech vaginal delivery when malpresentation is diagnosed at the time of stillbirth.

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References

1. American College of Obstetricians and Gynecologists. Management of stillbirth: Obstetric Care Consensus No. 10. *Obstet Gynecol* 2020;135:e110–e132. [PubMed: 32080052]
2. Chakhtoura NA, Reddy UM. Management of stillbirth delivery. *Semin Perinatol* 2015;39:501–504. [PubMed: 26341069]
3. Stefano VD, Santolaya-Forgas J, Faro R, et al. Mode of delivery in stillbirth, 1995–2004. *Reprod Sci* 2016;23:92–97. [PubMed: 26156855]
4. An Act to Amend the Vital Statistics Act: Act 1254 of 1995 (Ark 1995). <https://www.sos.arkansas.gov/uploads/rulesRegs/Arkansas%20Register/2016/feb2016/007.12.15-001.pdf>. Accessed April 25, 2021.
5. Ramirez MM, Gilbert S, Landon MB, et al. Mode of delivery in women with antepartum fetal death and prior cesarean delivery. *Am J Perinatol* 2010;27:825–830. [PubMed: 20486068]
6. Boyle A, Preslar JP, Hogue CJ, et al. Route of delivery in women with stillbirth: results from the stillbirth collaborative research network. *Obstet Gynecol* 2017;129:693–698. [PubMed: 28333794]
7. External Cephalic Version: ACOG Practice Bulletin, Number 221. *Obstet Gynecol*. 5 2020;135(5):e203–e212. doi:10.1097/aog.0000000000003837 [PubMed: 32332415]
8. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 745: mode of term singleton breech delivery. *Obstet Gynecol* 2018;132:e60–e63. [PubMed: 30045211]
9. Caughey AB, Cahill AG, Guise JM, et al. Safe prevention of the primary cesarean delivery. *Am J Obstet Gynecol* 2014;210:179–193. [PubMed: 24565430]
10. Marshall NE, Fu R, Guise JM. Impact of multiple cesarean deliveries on maternal morbidity: a systematic review. *Am J Obstet Gynecol* 2011;205:262.e1–e8. [PubMed: 22071057]

11. Roy A, Peaceman A, Son M, et al. Maternal obstetric complication rates remain high in Illinois: a retrospective study, 2010–2015. *Jt Comm J Qual Patient Saf* 2019;45:24–30. [PubMed: 30121161]
12. Asch DA, Nicholson S, Srinivas S, et al. Evaluating obstetrical residency programs using patient outcomes. *JAMA* 2009;302:1277–1283. [PubMed: 19773562]

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Key Points

- Common indications for cesarean delivery were prior cesarean delivery (41%), malpresentation (18.7%), and abruption or hemorrhage (13.1%).
- Sixty-five percent of patients delivered by cesarean following stillbirth had a history of a prior cesarean delivery.
- Surgical complications were present in 22.7% of cases.
- Prior cesarean delivery remains a common indication for a repeat abdominal delivery following a stillbirth despite the lack of fetal benefit.

Table 1.

Descriptive statistics among state stillbirths delivered by cesarean, July 2015–June 2019

Variable	Statistic
Age, y, mean \pm SD	29.51 \pm 6.60
Gravity, mean \pm SD	3.20 \pm 2.08
Parity, mean \pm SD	1.64 \pm 1.65
Gestational age at demise, mean weeks \pm SD	34.52 \pm 4.37
Gestational age at delivery, mean weeks \pm SD	34.78 \pm 4.15
Birth weight (g), mean \pm SD	2707.47 \pm 1183.67
Race/ethnicity, N (%)	
White	38 (50.7)
Black	33 (44)
Other	4 (5.3)
Substance misuse, N (%)	
No	53 (70.7)
Yes	8 (10.7)
Unknown/missing	14 (18.7)
Genetic testing, N (%)	
No	72 (96)
Yes	3 (4)
Prior cesarean, N (%)	
No	26 (35.1)
Yes	48 (64.9)
Hysterotomy type, N (%)	
Low transverse	73 (97.3)
Classical	0 (0)
Low vertical	0 (0)
Unknown/missing	2 (2.7)
Sterilization, N (%)	
No	70 (93.3)
Yes	5 (6.7)
Complications, N (%)	
No	55 (73.3)
Yes	17 (22.7)
Unknown/missing	3 (4)

SD, standard deviation.

Table 2.

Indication for cesarean delivery (n = 75)

Listed indication for cesarean delivery	n	%
Prior cesarean	31	41.3
Malpresentation	14	18.7
Breech	5	
Transverse	4	
Twin gestation	1	
Face	2	
Not specified	2	
Abruption or hemorrhage	10	13.3
Suspected macrosomia	4	5.3
Placenta previa	3	4.0
Maternal request	3	4.0
Stillbirth as sole indication	3	4.0
Failed induction or labor arrest	2	2.7
Undesired fertility/planned sterilization	2	2.7
Remote for delivery/unfavorable cervix	1	1.3
Mullerian anomaly	1	1.3
Uterine rupture	1	1.3
None listed	1	1.3

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Table 3.

Peripartum complications after cesarean delivery

Complication	n	%
Hemorrhage, transfusion, coagulopathy	4	28.6
Infection	5	35.7
Uterine dehiscence	1	7.1
Surgical complications		
Hysterotomy extension	3	21.4
Postoperative ileus	1	7.1

Overall complication rate: 14/75 (18.7%).

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