JOURNAL OF WOMEN'S HEALTH
Volume 27, Number 3, 2018
© Mary Ann Liebert, Inc.
DOI: 10.1089/jwh.2016.6309

Emergency Department Visits for Postpartum Complications

Erin Christine Brousseau, MD, MPH, Valery Danilack, PhD, MPH,
Fei Cai, MD, and Kristen A. Matteson, MD, MPH

Abstract

Introduction: Most estimates of the prevalence and types of postpartum complications are based on hospital readmissions. However, using hospital readmissions (which occurs in only 1%–2% of postpartum women) is problematic as it fails to include women with postpartum complications assessed in the office or emergency department (ED). We utilized data from a cohort of women evaluated in an ED setting to better characterize complications experienced by women in the postpartum period.
Materials and Methods: We performed a retrospective analysis of all postpartum visits to the ED at a tertiary care women's hospital over 6 months. We described characteristics of the population and clinical details of the ED visit, specifically the presenting complaint, delivery type, final diagnosis, and admission rate.
Results: Among 5708 deliveries during the study period, 252 women had at least one visit to the ED within 42 days after delivery, and the median timing for first visit was 7.5 days postpartum. The most common presenting complaints were wound complication (17.5%), fever (17.1%), abdominal pain (15.9%), headache/dizziness (12.3%), breast problem (10.7%), and hypertension (10.3%). Fifty-seven percent of these visits were by women who delivered vaginally and 54% of women were multiparous. The most common final diagnosis was a normal postpartum examination and only 22% of women were readmitted.
Conclusion: Women presenting to the ED postpartum period had a wide variety of medical issues but 78% were not admitted. Given the timing and low acuity of many visits, better postpartum education may be a tool to reduce nonemergent postpartum ED visits.

Keywords: postpartum, emergency department, obstetrics

Introduction

Nearly four million women give birth in the United States each year[1]; however, little is known about the complications women experience during the postpartum time period. Two recent studies highlighted utilization of the emergency department (ED) for postpartum complications and showed that up to 25% of women seek care in the ED in the first 6 months postpartum.[2,3] Up to 50% of these visits occurred within 10 days of hospital discharge.[3] These studies suggest the need to develop strategies to prevent or better manage postpartum complications.

To prevent postpartum complications and optimize their management, a better understanding is needed of the types, prevalence, and timing of complications that postpartum women experience. The current knowledge, largely based on the 1%–2% of postpartum women with conditions severe enough to warrant hospital readmission, is inadequate to inform the needs of all new mothers. It is likely that many medical concerns and complications are not captured in studies restricted to populations of postpartum women readmitted to the hospital; a population of women presenting to an ED for medical care during the postpartum period may provide a more comprehensive picture of the complications postpartum women experience.

The objective of this study is to examine the obstetric history, delivery, and postpartum course, and details of the postpartum ED visit to provide a comprehensive description of a population of women who sought ED-level care during the postpartum period. The hypothesis is that there will be commonality in the characteristics among the cohort, or a similarity in the concerns that brought postpartum women to the ED. With this knowledge, interventions could be targeted to specific postpartum populations or postpartum problems to prevent ED visits and improve overall postpartum health.

Department of Obstetrics and Gynecology, Women and Infants Hospital and the Warren Alpert Medical School of Brown University, Providence, Rhode Island.

Materials and Methods

This is a retrospective cohort study of all postpartum patients who presented to the ED at a tertiary care women's hospital over a 6-month period (December 1, 2013, to June 1, 2014). This study was approved by the Institutional Review Board of Women and Infants Hospital in Providence, Rhode Island (14-0064). The ED at Women and Infants Hospital is a women's-only ED that services a tertiary care hospital with almost 9000 deliveries per year. This site provided an ideal setting to investigate the unscheduled ED visits in a population of postpartum women.

A postpartum ED visit was defined as presentation to the ED within 42 days of delivery. This time period was used to highlight those problems that would be missed by a standard 6-week postpartum office visit, a common practice at our institution during this study. A comprehensive review of all available medical records, including the ED intake and clinical records, admission records, antenatal records, delivery and operative reports, and discharge documentation, was performed. Women with delivery occurring at less than 20 weeks of gestation were excluded. The chief complaint and final diagnosis in the ED were recorded verbatim from the language used in the medical record. At times, more than one presenting symptom, chief complaint, or final diagnosis was documented in the medical record. All documented symptoms and diagnoses were recorded to prevent any inconsistency or abstractor interpretation of the chart.

The chief complaints listed on the data abstraction included common postpartum complaints such as vaginal bleeding or vaginal discharge, obstetric wound complication, breast problem, fever, and abdominal pain. Some complaints were classified together in a systems-based category of symptoms such as ''cardiovascular'' including chest pain or palpitations, ''respiratory'' including shortness of breath, asthma, or cough, nausea, vomiting, diarrhea or constipation grouped in a ''GI category,'' ''GU'' including voiding difficulty or dysuria, ''neuro'' symptoms included headache, dizziness, or vertigo, and ''psych'' that included anxiety, depression, or psychosis. Categories for ''hypertension'' and ''told to come in by provider'' were also included. The category ''other'' included a write-in option for complaints not listed. After data abstraction, these ''other'' complaints were reviewed and in cases where more than four women used the same complaint, a new category was created. This created the new categories of back pain, vaginal/rectal pain, edema, and rash. A category of ''unclear'' was utilized when there was no clear chief complaint anywhere in the ED documentation.

The diagnoses included were based on common diagnoses for reproductive aged women presenting to the W&I ED. Most diagnoses were discrete such as urinary tract infection, pyelonephritis, endometritis, hypertensive disorder, or pneumonia. A category ''viral illness'' included those cases in which the final diagnosis stated, ''viral illness,'' ''flu,'' or ''gastroenteritis.'' The diagnosis of ''normal postpartum examination'' was assigned when the final diagnosis indicated normal findings and no other specific diagnosis, or when physiologic postpartum occurrences such as breast engorgement, normally healing incision, or first menses were recorded. Categories of ''other-emergent'' and ''other-nonemergent'' were also included with a place to record text for the assigned diagnosis if it was not included in the list. Diagnoses that resulted in admission, transfer, or a treatment that could not have been provided in an office setting were considered ''other-emergent.'' Diagnoses were classified as ''other-nonemergent'' if they were diagnoses that could have been fully evaluated and treated in an outpatient office setting. For example, vaginal swelling and general fatigue were classified as ''other-nonemergent.'' Instances in which a woman was transferred to a Level I Trauma Center for evaluation by a nonobstetric provider were noted, and those women were assigned the disposition of ''transferred.''

Descriptive statistics were used to quantify demographic factors, comorbidities, obstetric histories, chief complaints, and final diagnoses of women who presented to the ED during the postpartum period. Frequencies and percentages were reported on the characteristics of the population. Analyses were performed with SAS version 9.3 (SAS, Inc., Cary, NC).

Results

During the study period, there were 5708 deliveries and 252 (5%) women had at least one visit to the ED within 42 days after delivery. Of women with a postpartum ED visit, 21% ($n=52$) had more than one visit during this time period. First ED visits occurred 7 days (median) postpartum and second and third ED visits occurred at a median of 12 and 24 days, respectively. Maternal characteristics are shown in Table 1. The average maternal age of postpartum women was 29.0 ± 6.2 years and mean gestational age at delivery was 38.1 ± 2.4 weeks. Forty-six percent of the women were primiparous, 29% had one previous delivery, and more than 25% had two or more previous deliveries. Almost 90% had documentation of health insurance, including 40% of women

Table 1. Population Characteristics

Maternal age at delivery (years)	29 ± 6.2
Parity	
0	116 (46.0)
1	72 (28.6)
2 or more	64 (25.4)
Insurance for pregnancy	
None	12 (4.8)
Government	100 (39.7)
Private	127 (50.4)
Unknown	13 (5.2)
Race/ethnicity	
Caucasian	132 (52.4)
Black	27 (10.7)
Hispanic	34 (13.5)
Asian	13 (5.2)
Other	12 (4.8)
Mixed	9 (3.6)
Unknown	25 (9.9)
Tobacco use in pregnancy	25 (9.9)
Body mass index (kg/m^2)	28.7 ± 8.0
Gestational age at delivery (weeks)	38.1 ± 2.4
Type of delivery	
Spontaneous vaginal delivery	132 (52.4)
Operative vaginal delivery	10 (4.0)
Planned cesarean section	67 (26.6)
Unplanned cesarean section	43 (17.1)

Mean ± standard deviation for continuous variables and *n* (%) for categorical variables.

Table 2. Maternal Comorbidities, n (%)

None	79 (31.4)
Asthma	39 (15.5)
Heart disease	6 (2.4)
Diabetes	4 (1.6)
Hypertension	26 (10.3)
Anemia	38 (15.1)
Anxiety	54 (21.4)
Depression	56 (22.2)
Obesity	79 (31.4)
Chronic pain	3 (1.2)
Thyroid disorder	16 (6.4)
Immunologic/rheumatologic disorder	8 (3.2)
Renal/urinary tract disorder	8 (3.2)
Neurologic, including seizure disorder	7 (2.8)

May have more than one comorbidity.

on Medicaid. More than half of the women (56%) had a vaginal delivery, with 27% delivered *via* planned cesarean delivery and 17% delivered *via* an unplanned cesarean.

In terms of potential risk factors for postpartum complications, 69% of the women who presented to the ED for care during the postpartum period had a recorded comorbidity documented in the prenatal record (Table 2). The most common comorbidities were obesity (31%), depression (22%), and anxiety (21%). Pre-existing hypertension and diabetes were less common, seen in 10% and 2% of the population, respectively. Thirty-four percent of women did not experience any antepartum obstetric complications, while 32% experienced a hypertensive disorder of pregnancy and less than 10% had a diagnosis of gestational diabetes (Table 3).

In this cohort of postpartum women who presented to the ED for care, several different types and categories of patient-reported chief complaints and discharge diagnoses were identified (Table 4). Obstetric wound complication, fevers, and abdominal pain were the most common chief complaint at the first ED visit, seen in 18%, 17%, and 16%, respectively. Headaches or dizziness, breast problems, vaginal bleeding, and hypertension were each reported as chief complaints in about 10% of women presenting for their first ED visit during the postpartum period. Among women with more than one visit to the ED, obstetric wound complication, headache or

Table 3. Obstetric Complications, n (%)

None	87 (34.5)
Placenta previa or abruption	9 (3.6)
Preterm labor	8 (3.2)
Premature rupture of membranes	14 (5.6)
Gestational diabetes	25 (9.9)
Gestational hypertension	47 (18.7)
Preeclampsia	34 (13.5)
Intrauterine fetal demise	3 (1.2)
Intrauterine growth restriction	7 (2.8)
Renal stone or pyelonephritis	6 (2.4)
Multiple gestation	8 (3.2)
Malpresentation	17 (6.8)
Vaginal bleeding in pregnancy	3 (1.2)
Thromboembolic disorder or anticoagulation treatment	6 (2.4)

May have more than one complication.

Table 4. Emergency Department Chief Complaint, n (%)

Description	*Visit 1* (n = *252*)	*Visit 2* (n = *41*)	*Visit 3* (n = *8*)
None listed	1 (0.4)	0 (0.0)	0 (0.0)
Vaginal bleeding	27 (10.7)	3 (7.3)	0 (0.0)
Vaginal discharge	6 (2.4)	1 (2.4)	0 (0.0)
Obstetric wound complication	44 (17.5)	9 (22.0)	0 (0.0)
Fever	43 (17.1)	5 (12.2)	2 (25.0)
Neurology: headache, syncope, dizziness	31 (12.3)	7 (17.1)	2 (25.0)
Cardiology: chest pain, palpitations	15 (6.0)	7 (17.1)	1 (12.5)
Respiratory: shortness of breath, asthma, cough	12 (4.8)	3 (7.3)	1 (12.5)
Gastrointestinal: nausea, vomiting, diarrhea, constipation	19 (7.5)	1 (2.4)	2 (25.0)
Genitourinary: voiding difficulty, dysuria	19 (7.5)	3 (7.3)	0 (0.0)
Psychiatric: depression, anxiety	6 (2.4)	0 (0.0)	0 (0.0)
Breast problem	27 (10.7)	3 (7.3)	0 (0.0)
Hypertension	26 (10.3)	9 (22.0)	2 (25.0)
Pain, abdominal	40 (15.9)	3 (7.3)	2 (25.0)
Pain, vaginal or rectal	4 (1.6)	0 (0.0)	0 (0.0)
Pain, back	12 (4.8)	1 (2.4)	0 (0.0)
Edema/swelling	10 (4.0)	1 (2.4)	0 (0.0)
Rash	4 (1.6)	0 (0.0)	0 (0.0)
Told to come to ED by provider	19 (7.5)	7 (17.1)	1 (12.5)
Other	14 (5.6)	3 (7.3)	0 (0.0)

May have more than one chief complaint.
ED, emergency department.

dizziness, and hypertension continued to be common chief complaints in subsequent visits; one of these symptoms was reported at least 61% of the time at the second visit. For first ED visits, the most common discharge diagnosis was normal postpartum examination (27%) followed by hypertensive disorder (21%) and wound infection (9%). A diagnosis of hypertension became an increasingly prevalent diagnosis from the first to the third visit, 21%, 37%, and then 50%, respectively (Table 5).

Nearly 80% of women presenting for their first ED visit were discharged home from the ED. Discharge home was less likely on visit 2 (68%) and visit 3 (63%). Readmission rates differed by delivery type but not by parity. Among 141 women with vaginal deliveries seen for a first visit in the ED, 39 (27.7%) were admitted or transferred. Among 110 women with cesarean deliveries, 18 (16.4%) were admitted or transferred ($p = 0.03$). The readmission rate for first-time mothers was 19.1% compared to 25.7% for multiparous women ($p = 0.21$). Furthermore, primiparous women were not more likely than multiparous women to receive an ED discharge diagnosis of ''normal postpartum examination'' (18.1% compared to 26.5%, $p = 0.11$). Finally, readmission rates differed by chief complaint with the strongest associations between chief complaint and admission seen with neurologic or cardiorespiratory symptoms, hypertension, or being told to come to ED by their provider.

Table 5. Emergency Department Final Diagnosis, *n* (%)

Description	*Visit 1* (n=*252*)	*Visit 2* (n=*41*)	*Visit 3* (n=*8*)
Unclear	6 (2.4)	0 (0.0)	1 (12.5)
Postpartum bleeding	5 (2.0)	1 (2.4)	0 (0.0)
Wound infection	23 (9.1)	5 (12.2)	0 (0.0)
Fever unknown origin	2 (0.8)	0 (0.0)	0 (0.0)
Viral illness	13 (5.2)	0 (0.0)	1 (12.5)
Pyelonephritis	4 (1.6)	1 (2.4)	0 (0.0)
Urinary tract infection	14 (5.6)	1 (2.4)	0 (0.0)
Nephrolithiasis	1 (0.4)	0 (0.0)	0 (0.0)
Breast infection	16 (6.4)	3 (7.3)	1 (12.5)
Breast problem, not infected	9 (3.6)	0 (0.0)	0 (0.0)
Endometritis	12 (4.8)	2 (4.9)	0 (0.0)
Hypertensive disorder	52 (20.6)	15 (36.6)	4 (50.0)
Cholecystitis	3 (1.2)	0 (0.0)	0 (0.0)
Pneumonia	3 (1.2)	0 (0.0)	0 (0.0)
Constipation	1 (0.4)	0 (0.0)	0 (0.0)
Headache	4 (1.6)	0 (0.0)	1 (12.5)
Anxiety	4 (1.6)	1 (2.4)	0 (0.0)
Depression	6 (2.4)	0 (0.0)	0 (0.0)
Psychosis	0 (0.0)	0 (0.0)	0 (0.0)
Thromboembolic disorder	3 (1.2)	0 (0.0)	0 (0.0)
Edema	5 (2.0)	1 (2.4)	0 (0.0)
Dizziness/syncope	1 (0.4)	0 (0.0)	0 (0.0)
Normal postpartum examination	68 (27.0)	3 (7.3)	0 (0.0)
Other—emergent	13 (5.2)	2 (4.9)	2 (25.0)
Other—nonemergent	21 (8.3)	7 (17.1)	0 (0.0)

May have more than one final diagnosis.

Discussion

Women with problems in the postpartum time period present for care in the outpatient setting, the inpatient setting, and in urgent and emergent care centers. Five percent of postpartum women who delivered at our institution during a 6-month period presented for medical care in our ED during the 42 days postdelivery. Women who presented to the ED postpartum varied widely in terms of chief complaint and discharge diagnosis. Thus, there did not appear to be a distinct population characteristic to target for intervention. However, the timing of ED presentation and the high rate of women with a normal examination suggest that a reexamination of the current postpartum standard of care may be warranted.

It was the expectation that through this evaluation, a common postpartum complication or set of problems that result in women seeking care in an ED would be discovered. With that information, postpartum education or medical care could be tailored to a specific diagnosis or problem to prevent the need to seek care in an ED. Interestingly, the final ED diagnosis assigned to women who presented to the ED during the postpartum time period varied widely. Notably, the most common final diagnosis at the first ED visit was a normal postpartum examination. The second most common diagnosis for this cohort was hypertension; and hypertension was increasingly more prevalent of a diagnosis for second and third ED visits. Symptoms such as fever, obstetric wound complications, and abdominal pain were frequent chief complaints on presentation to the ED. However, we did not find a single infection site to target as the prevalence of postpartum infectious diagnoses was varied. The most common site was the cesarean section incision site, followed by breast infection, urinary tract infection, endometritis, pyelonephritis, cholecystitis, and pneumonia.

It is possible that the answer is in better education about common postpartum health experiences. That 68 women received a diagnosis of ''normal postpartum examination'' suggests that some of these ED visits could have been prevented by improved knowledge about the physiology of the postpartum period. It seems plausible that first-time mothers will have more concerns and questions about their postpartum health than women who have had other children. However, multiparous women made up a substantial proportion of the population of postpartum women who sought care in the ED. Multiparous women were just as likely to be discharged with the diagnosis of ''normal postpartum examination'' as primiparous women, and were no more likely to be admitted to the hospital. This suggests that both primiparous and multiparous women could benefit from increased education about the expectations of a normal postpartum experience. The majority of all visits were nonurgent and suggest that our current discharge preparation is inadequate for many postpartum women.

The current standard for the timing of a postpartum visit is 4–6 weeks after delivery, although this recommendation has been recently questioned.[4,5] Women with complications such as hypertension and diabetes are typically evaluated earlier for problem-focused visits.[4] However, more than 30% of the postpartum women in this cohort had no comorbidities or obstetric complications that would qualify them for early evaluation. The median postpartum day was 7 days for visit 1, 12 days for visit 2, and 24 for visit 3. The median of 7 days for the first visit is only 3 to 5 days postdischarge from the hospital. These data support previous literature suggesting that a scheduled postpartum visit at 4–6 weeks may be inadequate for some women.[3]

Nonurgent use of the ED is a problem in the general population, with most studies determining that at least 30% of all ED visits in the United States are nonurgent.[6] A systematic review of nonurgent ED visits found that convenience, lack of available office visits, and recommendation by providers to go to the ED are common reasons adults choose to present to an ED.[6] Particularly troubling are nonurgent ED visits shortly after a hospitalization, which may indicate poor discharge planning. Research is already being conducted to examine the content and consistency of postpartum nursing discharge instructions to decrease postpartum maternal morbidities.[7] Standardized discharge instructions could prevent morbidity and mortality in addition to preventing unnecessary ED use.

Alternatively, postdischarge nurse phone calls have been shown to improve patient satisfaction and reduce the rate of ED visits in a pediatric population.[8] Although the current literature on telephone support in the postpartum period is inconsistent,[9] the results of our study suggest that postpartum women may also benefit from some form of extended maternal health surveillance beyond the delivery hospitalization.

This study is limited by its retrospective design, which necessitates reliance on documentation within medical records for comprehensive data collection. Although medical record documentation, particularly of variables such as maternal comorbidities, may not be complete, this was minimized as a concern by using several different sources for data abstraction,

including prenatal office charts, hospital admissions, and nursing notes. It is also possible that some women sought care elsewhere and therefore would not be captured in this review. However, Women and Infants Hospital is the largest obstetrical facility in the state and we would not expect women who sought care elsewhere to differ considerably from those who returned to the Women and Infants ED with regard to the factors of interest. As data were only collected on women who sought postpartum care in the ED, we were not able to compare baseline and pregnancy characteristics among postpartum women with and without ED visits.

In conclusion, these data suggest that the needs of obstetric patients do not end at delivery only to be addressed again 6 weeks later. With much attention on the antenatal care and delivery experience, we are failing to continue this high level of care to our postpartum population. Improved education and counseling about what to expect in the normal postpartum period could decrease anxiety and unnecessary utilization of EDs in the postpartum period. Further research to investigate the specific complications occurring in the postpartum period could help determine whether an early postpartum routine visit with a healthcare provider is warranted to reduce nonurgent ED utilization.

Acknowledgment

This work was supported by the National Institutes of Health (K12HD050108).

Author Disclosure Statement

No competing financial interests exist.

References

1. Hamilton BE, Martin JA, Osterman M, Curtin SC, Mathews TJ. Births: Final data for 2014. Natl Vital Stat Rep 2015;64:1–64.
2. Harris A, Chang H, Wang L, et al. Emergency room utilization after medically complicated pregnancies: A Medicaid claims analysis. J Womens Health 2015;24:745–754.
3. Clark SL, Belfort MA, Dildy GA, et al. Emergency department use during the postpartum period: Implications for current management of the puerperium. Am J Obstet Gynecol 2010;203:38.e1–e6.
4. American College of Obstetricians and Gynecologists. Committee Opinion No. 666: Optimizing postpartum care. Obstet Gynecol 2016;127:e187–e192.
5. Handler A. Health Resources and Services Administration. Reproductive-perinatal continuum. Pivotal points of action across the continuum. Available at: http://hrsa.gov/advisorycommittees/mchbadvisory/InfantMortality/Meetings/20140709/handler.pdf Accessed April 3, 2017.
6. Uscher-Pines L, Pines J, Kellermann A, Gillen E, Mehrotra A. Deciding to visit the emergency department for non-urgent conditions: A systematic review of the literature. Am J Manag Care 2013;19:47–59.
7. Suplee PD, Kleppel L, Santa-Donato A, Bingham D. Improving postpartum education about warning signs of maternal morbidity and mortality. Nurs Womens Health 2016;20:553–567.
8. Yang C, Chen C. Effects of post-discharge telephone calls on the rate of emergency department visits in paediatric patients. J Paediatr Child Health 2012;48:931–935.
9. Lavender T, Richens Y, Milan SJ, Smyth RMD, Dowswell T. Telephone support for women during pregnancy and the first six weeks postpartum. Cochrane Database Syst Rev 2013:CD009338.

Address correspondence to:
Erin Christine Brousseau, MD, MPH
Department of Obstetrics and Gynecology
Women and Infants Hospital and the Warren
Alpert Medical School of Brown University
101 Dudley Street
Providence, RI 02905

E-mail: ebrousseau@wihri.org