

Emergency Department Visits after Childbirth: A Need to Reassess Postpartum Care?

Tiffany Chang¹, Chi Dola^{1*}, Robert diBenedetto¹, Elizabeth Zabel¹, Francis Finneran¹, Kim-Anh Tran¹, Daphne Tice¹, Courtney Rozbisky¹, Joseph L Hagan² and Irene Stafford²

¹Tulane Health Sciences Center, USA

²Louisiana Health Sciences Center, USA

***Corresponding Author:** Chi Dola, Department of Obstetrics and Gynecology, Tulane University School of Medicine, New Orleans, LA, USA.

Received: March 11, 2021; **Published:** April 29, 2021

Abstract

Objective: To describe the reasons for emergency department (ED) visits and hospital readmissions in the immediate postpartum period (defined as six weeks after delivery) and to assess whether the utilization of ED services could have been prevented.

Methods: We conducted a retrospective chart review of women who presented to the ED within six weeks after delivery. Pregnancy data was collected and analyzed for type of delivery and complications in the antepartum, intrapartum and postpartum periods. ED visit data was collected on timing, reason for visit, and re-admitting diagnosis. Descriptive and comparison analysis were performed.

Results: During the study period, 401 patients presented to the ED within the 6-week postpartum period. Of those, only 17.7% required hospital readmission. The re-admission rate was significantly higher in women presenting with hypertensive disorders of pregnancy (18.3%), shortness of breath (15.5%), and vaginal bleeding (19.7%) compared to those without those diagnoses ($p < 0.05$). Two hundred and forty-three (60.6%) visits occurred during the first week after discharge and 321 (80.0%) within two weeks. In the first 2 weeks postpartum, edema (7.8%; $P = 0.007$) and wound breakdown (20.6%, $P = 0.056$) were the most common presenting complaints within our population.

Conclusion: The majority of ED visits occurred within the first two weeks after childbirth and did not require hospital readmission. These findings suggest that earlier postpartum visits (rather than the traditional 6 weeks after delivery), thorough discharge counseling, and improved clinical support after discharge may decrease unnecessary ED visits in the postpartum period.

Keywords: Postpartum Period; Early Postpartum Visit; Emergency Department; Postpartum Readmission

Background

In the 6 weeks after having given birth, 4.8% of postpartum mothers utilized emergency hospital services with 1.2% requiring readmission [1,2]. If the follow-up postpartum visit is scheduled at 6 weeks after delivery, these ED visits and readmission would have occurred prior to this office visit. Of the 4 million women giving birth in the United States every year [1], this translates to almost 200,000 emergency department (ED) visits in the 6-week postpartum period, which in turn leads to significant financial burden to the health care system. Until recently, obstetrical care focused primarily on the antepartum and intrapartum period, whereas the immediate postpar-

tum period involved minimal physician-patient interaction, as patients were traditionally provided discharge instructions to follow-up 6 weeks after delivery. During this 6-week period, however, postpartum mothers may encounter problems and events, including normal or symptomatic recovery from having given birth and newborn childcare that may be perceived as stressful for the mother [2-4]. Major lifestyle changes may also evoke anxiety, especially in primiparous women [5]. Therefore, concerned postpartum mothers may ultimately resort to visiting the emergency department, which is often times perceived as the only available resource [6].

Despite widespread ED use by the postpartum population, research characterizing patient complaints, maternal morbidities and clinical grounds for hospital readmission is sparse. Previous studies show that cesarean delivery and shorter length of hospital stay after childbirth increase the risk of readmission [2,7]. Heavy vaginal bleeding and infection also lead to hospital readmission, particularly non-surgical or non-obstetrical infections including pneumonia, appendicitis, and cholecystitis, that indicate possible immunosuppression in the postpartum period [2-4]. Furthermore, women with high-risk pregnancies are more likely to be readmitted following childbirth [8].

The American College of Obstetricians and Gynecologists (ACOG) has recently recognized the importance of earlier postpartum follow-up and in May 2018, updated their recommendations for all initial postpartum follow-up within 3 weeks, followed by “ongoing care as needed” and a comprehensive postpartum visit within 12 weeks [9,10].

In this study, we characterize the reasons for emergency room visits, identify temporal factors that increase the likelihood of postpartum ED visits, and evaluate the medical severity of hospital readmissions in the immediate 6-week postpartum period. We hypothesize that most ED visits were not urgent and that earlier office postpartum follow-up, as recommended by ACOG, could reduce widespread use of emergency room services.

Methods

After receiving Institutional Review Board approval, we reviewed the medical records of all women who gave birth and were discharged from Tulane Lakeside Hospital between January 1, 2012 and December 31, 2015 and re-presented to the Tulane Lakeside ED within six weeks of delivery. This 3-year study period was selected to ensure that our cohort of patients scheduled their initial postpartum visits under the traditional 6-week recommendations [9], prior to ACOG’s revised guidelines for earlier postpartum follow-up published in 2018 [10].

Tulane Lakeside Hospital is a university-affiliated women and children’s hospital in the New Orleans metropolitan area that serves as the primary obstetrical hospital for the Tulane Obstetrics and Gynecology residency program as well as for private physicians in the community. Tulane-Lakeside Hospital serves a racially and ethnically diverse urban population, with the majority identifying as White, Black and Hispanic.

We used the ED logs of patients to identify our study population of postpartum women who visited the ED during the 6-week postpartum period. We collected demographic and clinical data, including maternal medical history, antepartum conditions, delivery outcomes and complications and neonatal outcomes. We recorded the timing of ED visits, defined as days after delivery; chief complaints and clinical indications for hospital admission to elucidate the clinical severity of postpartum ED visits. We also evaluated the timing of ED visits relative to office hours to determine the impact of patient access to ambulatory care by telephone or clinic appointments. Infant data was collected on gender, Apgar scores, admission to the neonatal intensive care unit (NICU) and discharge status. We also examined neonatal medical conditions, including NICU status at the time of the ED visit, to determine whether emergency hospital services were used for reasons of convenience and accessibility (i.e. during parental visits to the NICU).

All statistical analyses were performed using SAS software version 9.4 (SAS Institute Inc., Cary, North Carolina). Data is presented in median and range for quantitative variables or frequencies and percentages for categorical variables. The exact binomial test of the null

hypothesis was performed to determine the statistical probability that the majority of patients visited the ED within postpartum week 1. The Wilcoxon-Mann-Whitney test and Fisher's exact test were used to identify any significant differences between patients who were readmitted and patients who were discharged. A P-value less than 0.05 was considered statistically significant.

Results

Between January 2012 and December 2015, a total of 8,601 women delivered at our hospital and 401 women visited the ED during the 6-week postpartum period. Among all postpartum patients, the rate of return to the ED was 4.7% and the rate of hospital re-admission was 0.8%. Of all postpartum ED visits, 71 visits (17.7%) required readmission. Maternal demographics, medical history, and obstetrical information of our patient population are presented in table 1. The median (interquartile range [IQR]) of the maternal age of our study population was 27.0 (31.0 - 23.0) years and the median (IQR) gestational age at delivery was 39.0 (39.3 - 37.7) weeks. Of all postpartum women who presented to the ED, 17.8% were 21 years old or younger and 28.8% were first time mothers.

Age (years)	27.0 (31.0 - 23.0)
Gravidity	2.0 (4.0 - 1.0)
Parity	2.0 (3.0 - 1.0)
Gestational age at delivery (weeks)	39.0 (39.3 - 37.7)
Premature birth at less than 37 weeks	
Mode of delivery	
Vaginal delivery	153 (38.7)
Forceps-assisted vaginal delivery	15 (3.8)
Vacuum-assisted vaginal delivery	6 (1.5)
Primary Caesarean section	115 (29.1)
Repeat Caesarean section	106 (26.8)
Estimated blood loss (ml)	500.0 (600.0 - 300.0)
Medical Complications[†]	
Chronic hypertension	24 (6.0)
Diabetes	11 (2.7)
History of drug use	52 (13.0)
Other medical conditions ¹	154 (38.4)
None	203 (50.6)
Maternal Obstetrical Complications[†]	
Hypertensive disorder of pregnancy	41 (10.2)
Gestational diabetes	22 (5.4)
Preterm labor/premature rupture of membranes	60 (15.0)
Other obstetrical complications ²	52 (13.0)
None	289 (72.1)

Table 1: Maternal obstetrical characteristics*.

* Data presented as median (interquartile range) and number and percent.

[†]: Frequencies do not add to 401 and percentages do not add to 100% because some patients had multiple reasons for their ED visit.

¹: Other medical conditions include: obesity, asthma, sexually transmitted diseases, and HIV infection.

²: Other obstetrical complications include: chorioamnionitis, postpartum hemorrhage, placenta abruption, and placenta previa.

Preexisting and antepartum maternal medical conditions were reviewed (Table 1); 203 (50.6%) women had no medical conditions. Common maternal medical conditions included chronic hypertension (6.0%), diabetes mellitus (2.7%) and a reported history of substance abuse (13.0%). Other medical conditions noted in a small percentage of patients include obesity, asthma, sexually transmitted diseases, and HIV infection. Common obstetrical complications included hypertensive disorders of pregnancy (10.2%), gestational diabetes (5.4%) and preterm delivery (15.0%). Other obstetrical complications noted in a smaller percentage of women include chorioamnionitis, postpartum hemorrhage, placenta abruption, and placenta previa.

Characteristics of neonates born to patients who returned to the ED are presented in table 2. At delivery, 325 (87.8%) newborns were admitted to the well-baby nursery and 45 (12.1%) were admitted to the NICU. The majority of infants (87.8%) were discharged home on the same day as their mothers, while 12.2% remained in the hospital after maternal discharge. Only 31 (8.4%) infants still remained in the hospital at the time of their mother’s ED visit.

APGAR at one minute	9.0 (9.0 - 8.0)
APGAR at five minutes	9.0 (9.0 - 9.0)
Gender	
Male	188 (48.8)
Female	197 (51.1)
Well Baby Admission	325 (87.8)
NICU Admission	45 (12.1)
Newborn discharged with mother	324 (87.8)
Newborn remained in hospital after maternal discharge	45 (12.2)
Newborn still in hospital at time of ED visit	31 (8.4)

Table 2. Infant demographics*.

*: Data presented as median (interquartile range) and number and percent.

The timing of ED visits in the postpartum period are summarized in table 3. Of all ED visits, 243 (60.6%) women presented to the hospital within one week of discharge, 321 (80.0%) within two weeks, 351 (87.5%) within 3 weeks, 373 (93.0%) within four weeks, 390 (97.3%) within five weeks and 401 (100.0%) within 6 weeks. To determine whether limited access to outpatient clinical support contributed to ED visits, we determined whether the ED visit occurred outside of clinical office hours, defined as Monday through Friday from 9 AM to 5 PM. Of all ED visits, 130 visits (34.7%) occurred during office hours and 271 visits (48.9% of visits occurring after hours and 16.5% on weekends). There is no difference in the readmission rate whether the ED visits were during office hours or after-hours and on weekend, 18.9% versus 17.9%, respectively; p = .80.

First 7 days after discharge	243 (60.6)
First 14 days after discharge	321 (80.0)
First 21 days after discharge	351 (87.5)
First 28 days after discharge	373 (93.0)
First 35 days after discharge	390 (97.3)

Table 3: Timing of postpartum patient returned to the ED*.

*Data presented as number and percent.

Chief complaints for ED visits are shown in table 4. Overall, the most common complaints were abdominal pain (20.0%) and wound complications (18.7%), while edema (7.8%, $p = 0.007$) and wound breakdown (20.6%, $p = 0.056$) were most common in the first 2 weeks postpartum, as expected. In the ED, imaging studies were ordered on 35.1% patients and pathological findings were identified in 34.0% of these studies.

Fever and Chills	47 (11.7)
Abdominal pain	80 (20.0)
Headache	46 (11.5)
Shortness of breath	24 (6.0)
Bleeding	48 (12.0)
Wound complaint	75 (18.7)
Breast problem	17 (4.2)
Constipation	4 (1.0)
Edema	25 (6.2)
Episiotomy or laceration problems	2 (0.5)
Dysuria/hematuria	12 (3.0)
Endometritis	1 (0.3)
Thrombophlebitis	1 (0.3)
Hypertension/pre-eclampsia	17 (4.2)
Hemorrhoids	2 (0.5)
Psych condition or drug abuse	1 (0.3)
Other [‡]	92 (22.9)

Table 4: Reason for ED visit* †.

*: Data presented as number and percent.

†: Frequencies do not add to 401 and percentages do not add to 100% because some patients had multiple reasons for their ED visit.

‡: Includes dental pain, symptoms unrelated to post-partum care, need for prescription refills, nausea, and rashes.

Next, we stratified patients by ED triage status (i.e., readmitted or discharged) to evaluate any demographic, clinical, or timing risk factors for postpartum hospital readmission (Table 5). Readmission rate was similar among those delivered vaginally or by cesarean section (42.0% vs. 58.0%, respectively, $p = 0.789$). There is no statistical significance between those who were admitted and those who were discharged with regard to maternal medical conditions (57.8% vs. 46.0%, respectively, $p = 0.087$), or obstetrical complications (33.8% vs. 24.4%, respectively, $p = 0.134$).

	Readmitted (n = 71)	Discharged (n = 330)	P-value
Age (years)	27.1 ± 5.9	27.3 ± 5.8	0.736
Gravidity	2.7 ± 1.6	2.7 ± 1.7	0.948
Parity	1.6 ± 1.2	1.9 ± 1.3	0.064
EBL (ml)	511.0 ± 239.4	490.4 ± 276.3	0.412
EGA at delivery (weeks)	37.8 ± 2.4	38.1 ± 2.9	0.007 [†]
Hypertensive disorders of pregnancy	13 (18.3)	23 (7.3)	0.011 [†]
Shortness of Breath	11 (15.5%)	13 (4.2%)	0.001 [†]
Wound Breakdown	7 (9.9)	68 (21.9)	0.021 [†]
Vaginal Bleeding	14 (19.7%)	34 (10.9%)	0.049 [†]
Preterm	15 (21.7)	41 (13.7)	0.097
Term	54 (78.3)	259 (86.3)	
Patients with medical condition	41 (57.8)	143 (46.0)	0.087
Patients without medical condition	30 (42.3)	168 (54.0)	
Patients with obstetrical complication	24 (33.8)	76 (24.4)	0.134
Patient without obstetrical complication	47 (66.2)	235 (75.6)	
S/P Vaginal and operative vaginal delivery	29 (42.0)	136 (44.6)	0.789
S/P Cesarean section	40 (58.0)	169 (55.4)	
Days from hospital discharge to ED visit	7.8 ± 7.9	9.8 ± 9.5	0.163
Visited ED within 7 days postpartum	49 (69.0)	22 (31.0)	0.109
Visited ED within 14 days postpartum	61 (85.9)	10 (14.0)	0.191

Table 5: Characteristics of patients who were readmitted or discharged from the ED*.

*: Data presented as mean ± standard deviation and number and percent.

†: Indicates a statistically significant difference.

As expected, hospital readmission was more likely in postpartum patients presenting with shortness of breath (15.5%, $p = 0.001$) or vaginal bleeding (19.7%, $p = 0.049$), while patients presenting with wound breakdown were more likely to be discharged and managed as outpatient (21.9%, $p = 0.021$). There are 36 patients with hypertensive disorders of pregnancy who returned to the ED, 36.1% were readmitted and 63.9% were discharged and managed as outpatient. The patients with hypertensive disorders of pregnancy were more likely to be readmitted to the hospital compared to those without hypertensive disorders of pregnancy, 36.1% vs 16.5%, respectively; $p = 0.01$.

Discussion

Our findings showed an increased likelihood of ED visits in the first week of the postpartum period for clinical concerns that, generally, did not warrant hospital readmission for inpatient management. Most patients were triaged by ED personnel for complaints that did not require consultation of obstetrical services. These data suggest that most complaints were not of a clinical severity that required inpatient management and thus, could have been addressed in the outpatient setting.

We postulate that with appropriate discharge counseling and patient education, a patient's anxiety and concerns about certain common postpartum symptoms could be reduced and therefore, decrease use of emergency services. Clear and effective discharge counseling on patient postpartum expectations (i.e. normal versus emergent concerns), as well as reinforcing available clinical support resources for patients such as the outpatient phone line, can potentially address patient concerns or stressors and thus, decrease ED visits. While the majority of our study population visited the ED after clinic hours and on weekends, approximately one-third of our postpartum patients visited the ED during regular clinic hours. One possible explanation is the patient's primary obstetrician who practices at multiple clinical sites is not always readily available in person at one particular office space that may be shared by multiple providers in a group practice. Patients may perceive this scheduling as limited access to her physician and then elect to seek ED services. However, encouraging postpartum patients to contact office personnel initially for clinical support from other providers at the clinic would likely decrease the number of unnecessary emergency department visits and in turn, reduce healthcare costs. Establishing a covering physician who is available in person at the group practice to address concerns from patients under the care of other physicians in the group who may not be immediately available to see their patient in person could potentially decrease use of emergency services. These findings, most importantly, illustrate the obstetrician's responsibility to educate patients on available resources, including the clinic telephone line to initially address any patient complaints. The obstetrician can emphasize the importance for patients to call the clinic during office hours and if after hours, the labor and delivery unit or answering service, for any concerns. As our study showed, most complaints in the ED did not meet clinical criteria for hospital readmission and thus, could be effectively managed through either telephone guidance and reassurance or outpatient clinical evaluation and treatment. These measures could reduce unnecessary ED visits, utilization of emergency hospital services, and the rising cost of healthcare.

We also identified that the majority of postpartum women presented to the ED within the first week of discharge. Given that most postpartum patients are not evaluated until two weeks following cesarean delivery or six weeks following vaginal delivery, the initial postpartum period represents a crucial time during which patients may experience unfamiliar and/or worrisome symptoms. Management of this complex initial postpartum period could be improved with implementation of ACOG's revised recommendations for earlier postpartum evaluation within three weeks [10]. However, based on our data, the majority (87.5%) of our patients would have already visited the ED prior to the first follow-up visit at three weeks postpartum. With earlier follow-up in the first two weeks postpartum, obstetricians can help mothers better navigate the complexities faced in the postpartum period. Additional studies on the etiology and clinical nature of challenges faced by women in the postpartum period may elucidate an algorithm for the most effective time for the initial postpartum follow-up visit to address patient concerns and decrease the number of ED visits.

In our study, few differences in maternal demographics, obstetrical characteristics and outcomes were identified in postpartum patients triaged for hospital readmission or discharge from the ED. There was no significant difference in readmission rates between those

who delivered vaginally and by cesarean section (42.0% and 58.0%, respectively; $P = 0.789$) (Table 5). These findings are not consistent with the limited studies available, including findings that cesarean delivery [7,11], operative delivery [11] and shorter length of hospital stay⁷ increased the risk of hospital readmission within 60 days of discharge. Other studies found a higher readmission rate for patients who delivered by cesarean section (1.6 - 2.7%) than patients who delivered vaginally (1.3 - 1.5%) [2,11].

In addition, our study found that maternal medical conditions and obstetric complications did not differ significantly between those who were readmitted and those who were discharged from the ED. Belfort, *et al.* [2] found that hypertension and uterine and wound infections were the most common reasons for admission. Our study also reported that women suffering from hypertensive disorders of pregnancy were more likely to be readmitted along with those reporting shortness of breath, and vaginal bleeding, while patients with wound breakdown were more likely to be followed outpatient.

Our study was unique in examining the use of imaging studies, such as ultrasonography, computed tomography scan, or x-ray, during ED visits. Overuse of imaging and laboratory studies are known to contribute to rising healthcare costs [12]. While imaging studies were performed on one-third of our study cohort, the majority (66.0%) of results did not reveal any significant pathology. Reducing the number of postpartum ED visits at onset would certainly decrease the need for futile imaging studies, but further research is needed to refine imaging guidelines and prevent potentially costly and unnecessary imaging in the postpartum population.

Our study of the postpartum aspect of the nation's growing overuse of emergency medical resources was limited by a single experimental group of patients who returned to the ED in the postpartum period. While we compared risk factors for readmission and discharge from the ED in the postpartum period, the absence of a control group in this study limited the identification of risk factors for ED utilization in the postpartum period. Additionally, as postpartum depression is one of the many postpartum complications that often goes underdiagnosed or sub-optimally treated, our study did not systematically evaluate postpartum depression as a reason for ED visits. Lastly, socioeconomic factors (i.e. insurance factor, family support) were not evaluated as predictors of emergency service utilization by postpartum women.

Conclusion

Despite some limitations, our study identified that most ED visits occur within 2 weeks after patient gave birth and most postpartum complaints can be safely managed without the use of emergency services, as most patients did not require hospital admission and were discharged home from the ED. While the differences in ED management of postpartum patients may be attributed to differences in emergency medicine physician training, clinical assessment of risk and understanding of outpatient resources, interventions prior to discharge from hospital to effectively address the concerns of postpartum mothers are necessary to reduce unnecessary ED visits. With adequate postpartum counseling and earlier, more frequent postpartum follow-up visit as recently recommended by ACOG, unnecessary ED visits can be reduced without harm to patients. Greater obstetrician attention during the postpartum period can profoundly impact patients' overall well-being and on a larger scale, decrease substantial financial burden.

Bibliography

1. Clark SL, *et al.* "Emergency department use during the postpartum period: implications for current management of the puerperium". *American Journal of Obstetrics and Gynecology* 203.1 (2010): 38.
2. Belfort MA, *et al.* "Hospital readmission after delivery: evidence for an increased incidence of nonurogenital infection in the immediate postpartum period". *American Journal of Obstetrics and Gynecology* 202.1 (2010): 35.
3. Batra P, *et al.* "Emergency department care in the postpartum period: California births, 2009-2011". *Obstetrics and Gynecology* 130.5 (2017): 1073-1081.

4. Thung SF and Norwitz ER. "Postpartum care: we can and should do better". *American Journal of Obstetrics and Gynecology* 202.1 (2010): 1-4.
5. Halbreich U and Karkun S. "Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms". *Journal of Affective Disorders* 91.2-3 (2006): 97-111.
6. Paul IM, et al. "Postpartum anxiety and maternal-infant health outcomes 131.4 (2013): 1218-1224.
7. Liu S, et al. "Length of hospital stay, obstetric conditions at childbirth, and maternal readmission: A population-based cohort study". *American Journal of Obstetrics and Gynecology* 187.3 (2002): 681-687.
8. Hamilton MS, et al. "High-risk pregnancy: Postpartum rehospitalization". *Journal of Perinatology* 22.7 (2002): 566-571.
9. American College of Obstetricians and Gynecologists. Optimizing postpartum care. Committee Opinion No. 666. *Obstetrics and Gynecology* 127.6 (2016): e187-192.
10. American College of Obstetricians and Gynecologists. Optimizing postpartum care. Committee Opinion No. 736". *Obstetrics and Gynecology* 131.5 (2018): 949-951.
11. Liu S, et al. "Risk of maternal postpartum readmission associated with mode of delivery". *Obstetrics and Gynecology* 105.4 (2005): 836-842.
12. Smith-Bindman R, et al. "Rising use of diagnostic medical imaging in a large integrated health system". *Obstetrics and Gynecology* 105.4 (2005): 836-842.

Volume 10 Issue 5 May 2020

©All rights reserved by Chi Dola, et al.