# Emergency Department Use in the Perinatal Period: An Opportunity for Early Intervention

Saloni Malik, MD, MPH; Catherine Kothari, PhD; Colleen MacCallum, MS; Michael Liepman, MD; Shama Tareen, MD; Karin V. Rhodes, MD, MS*

*Corresponding Author. E-mail: krhodes@northwell.edu.

**Study objective:** We characterize emergency department (ED) utilization among perinatal women and identify differences in risk factors and outcomes between women who use versus do not use the ED during the perinatal period.

**Methods:** This is a retrospective cross-sectional study comparing patients who used the ED versus did not use the ED during the perinatal period. Patient data were collected from medical chart review and postpartum interviews.

**Results:** Of the 678 participants, 218 (33%) had at least 1 perinatal ED visit. Women who used the ED were more likely than those who did not to be adolescent (relative risk [RR] 2.23; 95% confidence interval [CI] 1.38 to 3.63), of minority race (RR 1.94; 95% CI 1.46 to 2.57), and Medicaid insured (RR 2.14; 95% CI 1.71 to 2.67). They were more likely to smoke prenatally (RR 3.42; 95% CI 2.34 to 4.99), to use recreational drugs prenatally (RR 3.53; 95% CI 1.78 to 7.03), and to have experienced domestic abuse (RR 1.78; 95% CI 1.12 to 2.83). They were more likely to have delayed entry to prenatal care (RR 2.01; 95% CI 1.46 to 2.77) and to experience postpartum depression (RR 2.97; 95% CI 1.90 to 4.64). Their infants were nearly twice as likely to be born prematurely (RR 1.92; 95% CI 1.07 to 3.47).

**Conclusion:** Results highlight that pregnant patients using the ED are a high-risk, vulnerable population. Routine ED screening and linkage of this vulnerable population to early prenatal care and psychosocial interventions should be considered as a public health strategy worth investigating. [Ann Emerg Med. 2017;■:1-5.]

Please see page XX for the Editor's Capsule Summary of this article.

0196-0644/$-see front matter

http://dx.doi.org/10.1016/j.annemergmed.2017.06.020

## INTRODUCTION

Although there is extensive literature on emergency department (ED) management of life-threatening conditions in pregnant patients, much less is known about maternal and fetal outcomes for the broader group of pregnant patients who present to the ED regardless of whether their chief complaints are specifically related to the pregnancy. Given the vulnerability of pregnant women and infants to adverse perinatal conditions, federal programs provide access to insurance that covers both prenatal care and social services during pregnancy and the postpartum period. Ideally, this includes obstetric care and access to a provider who can address health concerns during pregnancy. Research has shown that ED utilization in pregnancy is associated with inadequate prenatal care,[1] but to our knowledge no studies have specifically examined demographic and psychosocial characteristics of pregnant patients who use the ED compared with women who do not visit an ED during pregnancy, nor have differences in pregnancy outcomes for these groups been examined.

The objective of this study was to characterize ED utilization among a population-based cohort of postpartum women and identify differences in risk factors and outcomes between those who use versus do not use the ED during their pregnancy.

## MATERIALS AND METHODS

We conducted a retrospective cross-sectional secondary analysis of data collected before and after a public health initiative targeting postpartum depression. The study was conducted in Kalamazoo County, a predominantly rural area with 2 medium-sized towns and a population of approximately 250,000. Two hospital systems and 7 Federally Qualified Health Centers cover the southwest Michigan population. The parent study enrolled 2 population-based cohorts and conducted postpartum telephone interviews and detailed medical record review, providing a unique database that allowed us to characterize social characteristics, birth outcomes, and peripartum health care use, including ED use among enrolled women. The goal of this secondary analysis was to compare risk

**Editor's Capsule Summary**

*What is already known on this topic*

Pregnant women utilizing the emergency department (ED) are less likely to access adequate prenatal care.

*What question this study addressed*

This cross-sectional study examined self-reported risk factors and birth outcomes among 678 postpartum patients enrolled in a larger study in Michigan, comparing those who had prenatal ED visits with those who did not.

*What this study adds to our knowledge*

One third of study participants utilized the ED (for any reason) at least once during their pregnancy. Those with greater than or equal to one ED visit while pregnant were more likely to report multiple demographic and psychosocial risk factors (eg, cigarette smoking, domestic abuse, Medicaid insured) and to have poor birth outcomes (eg, premature birth, postpartum depression).

*How this is relevant to clinical practice*

This study reinforces that pregnant women utilizing the ED are a high-risk population.

factors and outcomes for women who used the ED with those who did not. We hypothesized that, compared with pregnant women who did not use the ED, women who used the ED during pregnancy would have higher rates of psychosocial risk.

Women giving birth in October 2002 to May 2003 and in February to May 2009 were recruited from the postpartum floors of the 2 delivery hospitals for postpartum surveys. Eligibility criteria were maternal residence in Kalamazoo County, medical clearance granted by hospital nursing staff, infant not being adopted, and maternal fluency in either English or Spanish. Participants were contacted twice, at 2 weeks and at 2 months postpartum, for telephone interviews with a survey instrument, which included validated depression and intimate partner violence screens, along with questions about health care use and maternal-child outcomes. One experienced master's-level researcher blinded to survey results abstracted prenatal and delivery medical records with a standardized abstraction form for variables that were clearly and objectively documented in the electronic medical record. Chart abstraction was monitored for accuracy by periodic quality checks. The survey and medical record data sets were linked by participant identification number. The participants in both time frames were compared and found to be similar in regard to maternal age, marital status, race or ethnicity, and prenatal care use. Because ED usage did not significantly vary between the 2 data collection periods, the participants were combined into a single population for the current study.

ED use (yes/no) was ascertained by examination of records of all EDs in the county. We assessed the association between ED use and participant characteristics, comparing demographic factors, psychosocial and health risk factors, and maternal and fetal outcomes; the outcome measures were defined according to information from the medical record and the survey data. Psychosocial and health risk factors were those positively documented in the prenatal period, including current smoking, alcohol use, drug use, prepregnancy body mass index, and prenatal care use. Intimate partner violence, either emotional or physical abuse, was assessed with 3 questions from intimate partner violence screens commonly recommended for health care settings; 2 were adapted from a computer-based intimate partner violence questionnaire,[2] and one was adapted from the Domestic Violence Initiative screening questions.[3] Partner violence was operationalized as a dichotomous variable, in which a "yes" to 1 or more of the 3 intimate partner violence items was considered a positive response. A prepregnancy body mass index of greater than or equal to 30 $kg/m^2$ was categorized as obese. The adequacy of prenatal care was assessed by the Kessner Adequacy of Prenatal Care Index, which categorizes use as inadequate, intermediate, and adequate, according to time of prenatal care initiation and number of visits attended.[4] Delayed entry into prenatal care was defined as initiation of prenatal care later than 12 weeks' gestation.

Maternal and fetal outcomes variables included low birth weight (2,500 g or less), prematurity (<37 weeks), postpartum visit attendance and pediatric immunizations at 2 months, and maternal postpartum depression. Participants who scored greater than or equal to 12 points on the Edinburgh Postnatal Depression Scale[5] at either 2 weeks or 2 months postpartum were categorized as positive for postpartum depression.

Descriptive statistics, frequency counts, and percentage rates were calculated for the county birth population according to published vital birth record statistics,[6] and for the study sample, stratified by ED use or not. Percentages were derived with valid responses only and reported as relative risks and 95% confidence intervals. The institutional review boards of both hospital systems approved the study.