

# Birth Outcomes in Relation to Intimate Partner Violence

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**Abstract:** *Objectives:* Intimate partner violence (IPV) during pregnancy is a significant public health problem. Approximately 324,000 IPV victimizations occur during pregnancy each year. However, research on the impact of IPV on birth outcomes yields conflicting findings. This study examines the association of IPV with birth outcomes among pregnant women.

*Study design:* We used a retrospective cohort study design to analyze data from chart reviews of a random sample of 1542 pregnant women. These women were seen between 2003 and 2009 at an urban university affiliated prenatal clinic and gave birth at the on-site hospital. Victims of IPV were defined as those who scored equal to or higher than 10 on an IPV screening tool: HITS (Hit, Insult, Threaten, and Scream). Three measures were included in birth outcomes. Preterm delivery was defined as gestational age less than 37 weeks. Low birth weight was defined as infants born weighing <2500 g. Neonatal intensive care was measured by prevalence of receiving intensive care.

*Results:* The prevalence of IPV was 7.5%. Compared to non-abused women, abused women were more likely to have preterm deliveries (18.3% vs. 10.3%;  $p = .016$ ). Compared to infants of non-victims, infants of victims were more likely to have low birth weight (21.5% vs. 11.0%;  $p = .003$ ) and to receive neonatal intensive care (23.4% vs. 7.8%;  $p = .000$ ). Results from multivariate analyses indicated that victims were more likely to have preterm deliveries than non-victims (OR = 1.72; 95% CI: 1.22-2.95). More infants of victims had low birth weight (OR = 2.03; 95% CI: 1.22-3.39) and received neonatal intensive care than those of non-victims (OR = 4.04; 95% CI: 2.46-6.61).

*Conclusions:* Abused pregnant women had poorer birth outcomes compared to non-abused pregnant women. Healthcare providers should be trained to screen and identify women for IPV, and interventions should be designed to reduce and prevent IPV and thereby improve health outcomes for victims and their children.

**Keywords:** Pregnancy ■ Violence ■ Preterm delivery ■ Low birth weight ■ Neonatal death

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## INTRODUCTION

Intimate partner violence (IPV) is a public health issue as well as a serious social problem. It is estimated that 5.3 million IPV victimizations occur each year.<sup>1</sup> More than 1 in 4 women experience IPV during their lifetime.<sup>2</sup> Abused women are at higher risk for physical and

mental health problems, including injury, chronic pain, gynecological and gastrointestinal problems, substance abuse, depression, anxiety, and posttraumatic stress disorder (PTSD).<sup>3–7</sup> The CDC estimate that IPV costs society \$5.8 billion annually for physical and mental health care, and lost productivity.<sup>8</sup>

Pregnant women are particularly vulnerable to the harmful effects of IPV, because the violence may affect both maternal and neonatal health. The prevalence of IPV during pregnancy is 0.9–26%, depending on variant IPV definitions and study designs.<sup>9–11</sup> Violence during pregnancy may be more common than preeclampsia, gestational diabetes, and placenta previa.<sup>10,12</sup> It is well documented that IPV around the time of pregnancy is associated with physical and mental health problems and negative health behaviors. Studies have found an increased risk of maternal injury and death, inadequate prenatal care, smoking and alcohol use in women who experienced IPV.<sup>10–16</sup>

Research on the impact of IPV on neonatal outcomes has yielded mixed results and conflicting findings may be due to variant definitions, different outcome measures, and study designs.<sup>10</sup> In a review of 23 studies, 10 studies reported no significant differences or mixed results in birth outcomes between abused and non-abused women. The remaining 13 studies found significant differences in birth outcomes: preterm delivery, low birth weight, fetal death, miscarriage and neonatal intensive care.<sup>10</sup> Among studies that found significant differences, the risk was 2–4 times greater for delivering a low birth weight infant.<sup>17,18</sup> Abused compared to non-abused women were 1.6–2.7 times as likely to have preterm delivery.<sup>19,20</sup> Another systematic review selected 8 studies for meta-analysis that assessed the association between IPV and low birth weight.<sup>21</sup> The bivariate association was found in 6 of those studies. However, among the 6 studies, one study did not control for other confounders and 2 studies found no differences after controlling for other factors.

This study aimed to clarify the role of IPV and its association with adverse birth outcomes. We analyzed data from chart reviews of pregnant women, who were screened for IPV at the first prenatal visit and the postpartum visit. Birth outcomes of the abused pregnant women were compared with those of the non-abused pregnant women.

We hypothesized that abused pregnant women would have poorer birth outcomes compared to non-abused pregnant women. Outcome measures were preterm delivery, neonatal intensive care, and low birth weight.

## MATERIALS AND METHODS

### *Study sample*

The participants for this study were patients of an urban university affiliated prenatal clinic and its on-site hospital. The prenatal clinic has 12 obstetrics and gynecology faculty and residents who provide medical care to approximately 2000 pregnant women per year. Inclusion criteria were pregnant women who were seen at the clinic, and who gave birth at the on-site hospital between January 1, 2003 and December 31, 2009. Women without documented IPV screening results, or women who did not give birth at the on-site hospital were excluded.

### *Procedures*

All pregnant women were screened for IPV at the first prenatal visit and the postpartum visit by the providers, and the screening results recorded in the computerized medical charts. We generated a computerized list of women who were seen at the prenatal clinic between January 1, 2003 and December 31, 2009 and had available IPV screening results. This computerized list included information on the names, unique medical record number, IPV screening results, age of the women, and date of visits. If a woman gave birth to more than 1 child during the study time frame, only the most recent pregnancy was included. The unique medical record numbers were used for random selection employing a computer-generated random sequence. Random selection was stratified by victim status. We abstracted from the first prenatal visit to postpartum visits.

Prior to the start of data collection, part-time chart abstractors received online training provided by the university in computerized medical record systems and issues of confidentiality. The research team developed a chart abstraction form. Training materials included explicit criteria for all variables abstracted. One investigator (MV) conducted 10 chart reviews to pilot test the chart abstraction form and training material. The data abstractors received intensive training by an investigator. At the beginning of data collection, interrater reliability for chart abstractors was assessed for the major outcome variables. Each abstractor reviewed a sample of the same 25 charts and a Kappa statistic was calculated. The data abstraction form was modified if the Kappa statistic was less than 0.7; and the data abstractor was retrained to insure the accuracy and reliability of chart abstraction.<sup>22,23</sup> Intrarater reliability was used to accomplish

ongoing monitoring of data quality. An investigator (PC) reviewed any discrepancies and corrected the data.

For birth outcomes, data were abstracted from the hospital electronic medical record (EMR) system. After the women gave birth at the on-site hospital, the newborn's unique medical record number was recorded in the mother's chart. The newborn also had her or his own chart, containing name, birth date, unique medical record number, mother's name, and mother's birth date, and other information. We used mother's name and mother's birth date to identify the charts of the newborns of the selected women. We abstracted birth outcomes of the infants from birth to hospital discharge.

### *Instruments and measures*

**IPV during pregnancy.** Our main independent variable was IPV measured by a 4-item IPV screening tool - HITS (Hurt, Insulted, Threatened with harm, and Screamed at).<sup>24</sup> HITS has been developed for use in primary care settings, and tested with diverse populations.<sup>24–27</sup> HITS measures IPV in a current relationship and is comprised of the following four items: (1) “How often does your partner physically hurt you?” (2) “How often does your partner insult you or talk down to you?” (3) “How often does your partner threaten you with harm?” and (4) “How often does your partner scream or curse at you?” Answers to each question are based on a 5-point scale from never to frequently (1–5). Answers are summed to form an interval scale of the total HITS score from 4 to 20. Using a cutoff score of 10.5, HITS has accurately classified 91% of non-victims and 96% of female victims.<sup>24</sup> HITS has demonstrated good reliability and concurrent validity with the Conflict Tactics Scale (CTS), an established gold standard for measuring partner violence. Cronbach's alpha was 0.80 for HITS and the correlation is 0.85 between HITS and CTS.

Strategies were used in the IPV screening protocols on the study site to minimize underreporting of IPV, including building relationships with the respondents, ensuring privacy and confidentiality, and providing the respondent with multiple opportunities for disclosure. All physicians and medical staff received training on screening techniques and the use of HITS. As most women regularly see the providers for routine exams, a relationship between providers and patients has been established. Women are seen alone in a private room where providers screen for IPV. Providers enter the information into the EMR and the computer automatically calculates the HITS score. The computer then generates a 'pop-up' warning when the patient scores above a particular threshold indicating additional investigation should occur. Physicians then refer victims to an on-site social worker for intervention. The

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