Domestic violence: Effect on pregnancy outcome

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A predominantly white, suburban, indigent population of pregnancy women were followed up to determine the incidence of domestic violence and its effect on preterm delivery, low birth weight, and outcome of pregnancy (infant admission to the neonatal intensive care unit). A total of 489 gravidas were screened for domestic violence and drug and alcohol abuse. Patients were assigned to the control group if they had no substance abuse and no domestic violence and to the study group if they had no substance abuse but were victims of domestic violence. Of the total study population, 20% were victims of domestic violence. Among patients suffering domestic violence, 22% had preterm deliveries as compared with 9% of patients without domestic violence \( (P = .002) \). Sixteen percent of patients in the study group had low-birth-weight babies compared with 6% of women in the control group \( (P = .002) \). No significant relationship was found between domestic violence and admission to the neonatal intensive care unit. Therefore, domestic violence is a risk factor for preterm delivery and low-birth-weight infants.

(Key words: Domestic violence, abuse, pregnancy outcome, low-birth-weight infants, preterm delivery)

Physical battering of women is an unfortunately common event in the United States. Although routine history will identify some women with abuse, the use of a nurse-interview assessment can increase the prevalence in this same obstetric population to 29.3%.\(^1\) Although more common in younger women, domestic violence cuts its path through all ages. It is most prevalent among white women but occurs in black and Hispanic women, as well.

Abuse is recurrent; most women report two or more episodes.\(^2\) Battering occurs equally across socioeconomic groups.\(^3\)

Parker and colleagues\(^4\) have shown physical abuse to be a risk factor in pregnancy. They found that abused women were more likely to enter prenatal care in their third trimester and that they were at significant risk for delivering a low-birth-weight infant. These women were at significant risk for low maternal weight gain, infections, and anemia, as well. They were more likely to smoke and use alcohol or drugs.

Because alcohol and drug abuse is an independent risk factor for low-birth-weight infants and poor pregnancy outcome, it is unclear whether domestic violence as an independent variable is associated with this risk or whether it is simply reflecting the prevalence of drug and alcohol use in this population.

The study reported here was designed to look at domestic violence as a risk factor for poor pregnancy outcome, while controlling for drug and alcohol abuse.

Subjects and methods

The study population consisted of 489 women between the ages of 18 and 35 years with singleton pregnancies that were managed between July 1993 and August 1995. The women were enrolled at a suburban prenatal clinic in a suburban setting dedicated to caring for recipients of Medicaid.

The patients underwent a nursing assessment interview using previously published screening tools for domestic violence.\(^5\) Multiparous patients with a history of previous preterm delivery and low-birth-weight neonates were excluded from the study. We also excluded patients who had iatrogenic preterm deliveries for medical indications.

The facility had a concomitant program for identification and counseling of gravidas who abused drugs and alcohol. Through this program, all study participants were screened for alcohol abuse by a trained counselor, using the well-accepted CAGE questionnaire (Figure) and by using urine drug screens. Patients who answered positively for drug and alcohol abuse on this questionnaire or patients who had positive urine drug screens were excluded.

Thus, we were able to assign the patients to a control group (no substance abuse and no domestic violence) or a study group (no substance abuse with domestic violence). Subjects were followed up through their pregnancy to delivery, and the outcomes of the pregnancies were recorded. The outcomes assessed were preterm delivery (<37 completed weeks of gestation), low birth weight (<2500 g), or infant admissions to the neonatal intensive care unit (NICU).

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Results
A total of 489 pregnant women were followed up over the course of their prenatal treatment through delivery. Of that population, 20% were victims of domestic violence. The frequency of preterm delivery and low birth weight were correlated with a contingency coefficient equal to .60. Of those patients without preterm deliveries (N=433), only 4 (1%) had low-birth-weight babies. Among those patients with preterm deliveries, 66% had low-birth-weight babies, and among patients with low-birth-weight babies, 90% had preterm deliveries.

The relationship between being a victim of domestic violence and having one of three outcomes of interest was examined, as follows:

- **Domestic violence related to preterm delivery—**Table 1 summarizes the results of this relationship. Of the 100 patients who were victims of domestic violence, 22 (22%) had preterm deliveries; only 34 (9%) of the 389 patients with domestic violence had preterm deliveries.

- **Domestic violence related to low birth weight—**Table 2 shows the relationship between domestic violence and low-birth-weight babies. Of the 100 patients who were victims of domestic violence, 16 (16%) had low-birth-weight babies, and 25 (6%) of the 389 patients who did not suffer domestic violence had low-birth-weight babies. A significant relationship existed between being a victim of domestic violence and having a low-birth-weight baby ($\chi^2 = 9.49; df=1; P=.002$). The relative risk of having a low-birth-weight baby for victims versus nonvictims was 2.5 (confidence interval = 1.38 to 4.48).

- **Domestic violence related to admission to the NICU—**No significant relationship was found between being a victim of domestic violence and having a baby in the NICU.

![Diagram of CAGE mnemonic](https://jaoa.org)

**Table 1**
Frequency and Percentage of Preterm Delivery According to Domestic Violence Experience (N=489)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Preterm delivery</th>
<th>Relative risk</th>
<th>95% Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic violence victim</td>
<td>22 (22%)</td>
<td>2.5</td>
<td>1.4 to 4.1</td>
</tr>
<tr>
<td>Nonvictim</td>
<td>34 (9%)</td>
<td>1.0</td>
<td>...</td>
</tr>
</tbody>
</table>

**Table 2**
Frequency and Percentage of Low-Birth-Weight Babies According to Domestic Violence Experience (N=489)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Low-birth-weight baby</th>
<th>Relative risk</th>
<th>95% Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic violence victim</td>
<td>16 (16%)</td>
<td>2.5</td>
<td>1.38 to 4.48</td>
</tr>
<tr>
<td>Nonvictim</td>
<td>25 (6%)</td>
<td>1.0</td>
<td>...</td>
</tr>
</tbody>
</table>

**Discussion**
Appropriate screening showed our population—predominantly white, indigent women—to have a 20% incidence of domestic violence. This incidence is consistent with previously reported data. We have shown that physical abuse is a risk factor for preterm delivery and low-birth-weight infants. According to our findings, patients who are victims of domestic violence during pregnancy are 2.5 times more likely to have preterm deliveries.
delivery and a low-birth-weight infant than their nonvictim counterparts. This finding is consistent with that of Parker and colleagues, who also showed these women to be at risk for low-birth-weight infants. However, that group’s study also showed an increased use of drugs and alcohol, known risk factors for preterm delivery and low-birth-weight infants. By study design, we were able to eliminate drugs and alcohol use as a confounding variable.

Unfortunately, our database did not allow us to examine other confounding variables such as age, ethnicity, weight gain, maternal growth, and smoking. A prospective cohort analysis correcting for these and other confounding variables still needs to be done.

The increased risk attributed to domestic violence is quite disturbing. When multiplied by the number of pregnant patients who are victims of domestic violence, the potential newborn morbidity is impressive. Coupled with the already growing problem of high fetal morbidity in the United States, domestic violence in pregnancy and its effect on the unborn fetus carry an unacceptable, yet preventable risk. Therefore, healthcare professionals, especially those caring for pregnant women, should be extremely vigilant to the subtle clues of domestic violence.

Comment
Domestic violence is a preventable problem with a clear risk to the unborn fetus. Effective screening mechanisms are available. Those caring for the pregnant patient have an obligation to protect the fetus by identifying patients who are victims of domestic violence early in their pregnancies. Proper interventional steps should be taken to reduce the risk of preterm delivery and low-birth-weight babies.

References