

# Effect of Intimate Partner Violence on Maternal and Birth Outcomes of Pregnancy among Antenatal Clinic Attendees in Delhi: A Prospective Observational Study

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## Abstract

**Context:** Violence against women is a major public health problem and a violation of their human rights. Intimate partner violence (IPV) during pregnancy has been linked to various adverse maternal health outcomes and birth outcomes. **Aims:** The aim of this study is to assess the magnitude of maternal complications and adverse birth outcomes in relation to IPV. **Settings and Design:** Prospective observational study was conducted from April 2015 to May 2018 in the antenatal clinic of a Tertiary Care Hospital in Delhi. **Subjects and Methods:** Sample of 1500 pregnant women ( $\leq 20$  weeks gestation) were recruited and followed up at regular intervals, up to the birth outcome. **Statistical Analysis Used:** Data were analyzed using the Statistical Package for the Social Sciences version 25. Value of  $P < 0.05$  was considered statistically significant. **Results:** Prevalence of IPV at baseline was 29.7%. Significantly higher proportion of IPV victims (47.2%) had poor weight gain during the pregnancy. Subjects reporting violence at any of the study contacts had a higher incidence of preterm delivery (12.7%), and a significantly higher incidence of low birth weight in the newborns (32.1% vs 22.3%) ( $P < 0.05$ ). **Conclusions:** The findings reveal that IPV during pregnancy is common and significantly associated with adverse maternal and birth outcomes. The findings stress need for research and development of a screening tool to identify violence early in pregnancy and thus prevent its consequences.

**Keywords:** Birth, intimate, maternal, outcomes, partner, pregnancy, violence

## INTRODUCTION

Intimate partner violence (IPV) or Domestic violence against women is a major global public health issue and is a direct violation of the women's human rights. It refers to any act or behavior within an intimate relationship that causes harm to those in the relationship. The harm can be physical, sexual, or psychological/emotional. It exists in all settings and among all religious, cultural, or socioeconomic groups.<sup>[1-3]</sup> IPV negatively affects the various health aspects of women, namely physical, mental, sexual, reproductive, etc., Adverse health consequences may include unintended pregnancies, induced abortions, gynecological problems, and sexually transmitted infections (STIs), including HIV.<sup>[1,2]</sup>

IPV during the sensitive period of pregnancy has serious adverse effects on the mother and the child, both in the short-term and long-term. Higher incidence of miscarriage, preterm birth, stillbirth, low birth weight (LBW), premature labor, and fetal injury have been reported among women

suffering from violence during pregnancy. This individual effect on suffering women, due to high burden, accumulates to a higher social and economic costs at all levels, in the long run.<sup>[1,2]</sup> Adverse outcomes during pregnancy can be caused either by direct mechanisms or by indirect mechanisms. Any physical assault, like a blow to the abdomen or sexual violence during pregnancy, can directly cause adverse outcomes, like preterm labor, chorioamnionitis, fetal injury, or death.<sup>[4]</sup> The indirect mechanisms are due to related factors such as psychological stress, depression, substance abuse, or insufficient access to medical care, which can cause poor pregnancy outcomes.<sup>[1,2]</sup>

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The global estimates by the World Health Organization (WHO) highlight the prevalence of IPV to be 30%–35%.<sup>[1]</sup> Various population-level surveys and studies have reported varying levels of estimates of IPV over the world. An analysis by the WHO in 2013, reviewed existing data from over 80 countries. It was found that 42% of women reported an injury as a consequence of IPV. The occurrence of STIs was reported 1.5 times more in women who experienced physical or sexual violence. The occurrence of abortion was reported to be two times in women suffering IPV. It was also reported that women who suffered IPV were 16% more likely to suffer a miscarriage and 41% more likely to have a preterm birth.<sup>[1,5]</sup> The proportion of physical abuse during pregnancy varies from 4% to 12% across different sites, and the abuser being the biological father in over 90% of the instances.<sup>[3]</sup>

In Indian settings, the recent estimates of IPV during pregnancy were provided by the National Family Health Survey (NFHS-4-2015-16). Ever married women who reported experiencing violence during any pregnancy were 3.3% at the national level and 3.4% in the NCT of Delhi. The violence was reported to be more in rural areas (3.5%) compared to the urban areas (2.9%). These figures, though, are much lower compared to the overall prevalence of violence among ever-married women at 28.8%.<sup>[6,7]</sup> Various studies in similar settings have reported significant burden and adverse maternal outcomes in pregnant women suffering from IPV. With the above background, the current study was conceptualized to study the effect of IPV on maternal and birth outcomes among pregnant women in Delhi.

## SUBJECTS AND METHODS

### Study design

The study was designed as a prospective observational study.

### Study setting

Antenatal clinic of a tertiary care hospital, Lok Nayak Hospital, which is affiliated to Maulana Azad Medical College (MAMC), both being located in the central district of Delhi, India.

### Study period

The study commenced in April 2015 and was completed in May 2018.

### Study subjects (inclusion criteria)

The study included pregnant women with gestation period up to 20 weeks, residing in Delhi for more than a year, and were apparently healthy based on self-reports.

### Sample size

The prevalence of IPV was estimated to be 24.0%, based on quoted data sources, for the purpose of sample size calculation.<sup>[6,7]</sup> Taking allowable error of 10% and assuming nonresponder rate to be 15%, total sample size of 1500 was estimated for the study by using the formula for descriptive study.

### Methodology

All eligible participants fulfilling the inclusion criteria, were

recruited in the study, by consecutive/nonprobability sampling. A set of pretested semi-structured interview schedules were used for the collection of data from the study participants. Data were collected by face-to-face interviews with the study participants in the Hindi language, which was understood to them.

The data collection procedure had two components. In the first visit on recruitment in the study, baseline data collection was done. It was related to sociodemographic and obstetric variables and recorded the presence of any kind of violence. Subsequently, three follow-up visits were done during the 5<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> months of pregnancy and then final contact at the time of delivery. It was done in order to assess any form of violence experienced during the course of pregnancy on a continuum and also document the maternal and birth outcomes of the pregnancy.

### Statistical analysis

The data were entered in MS-Excel and analyzed using Statistical Package for Social Sciences version 25.0 by IBM Corporation (Armonk, New York, United States). Qualitative data was expressed in percentage, and statistical significance was evaluated by the Chi-square test or Fishers' exact test. Quantitative data were expressed as means and standard deviation, and statistical significance was checked by independent *t*-test/Wilcoxon rank sum Test. Risk ratio with confidence intervals was used to assess the magnitude of adverse maternal health and birth outcomes associated with the violence. Multivariate analysis with binomial logistic regression analysis was applied for adjusting the confounding factors.  $P < 0.05$  was considered statistically significant.

### Ethical considerations

Ethical approval was obtained from the Institutional Ethical Committee, of MAMC, New Delhi, India, before the initiation of the study. Written informed consent was taken from all the study participants, after explaining the nature and implications of the study to them. The subjects were assured of the complete confidentiality of data, and of their right to withdraw from the study at any time without losing any medical benefits from the hospital.

## RESULTS

A total of 1500 pregnant women were enrolled in the study at baseline. The majority of the study participants (84.3%) belonged to the age group of 20–29 years, and 3.5% were  $\leq 19$  years age. Age at marriage for majority (84.4%) of the study participants was in the range of 18–25 years, and 10.3% were married before the age of 18 years. Majority (82.9%) of the study subjects were of general caste, 10.1% were OBC, and rest were SC/ST. Analysis of religion revealed that 56.5% of the study subjects were Muslim by religion, and rest were Hindu by religion. Duration of stay in Delhi was more than 5 years for 75.5% of the study subjects, and 68.1% of the participants had joint type of family. Only 13.2% of the study participants were illiterate, and 15.9% were educated up to

graduate and above. Almost all (95.7%) of the participants were homemakers by occupation. The level of unemployment of husbands was only 1.5%.

A total of 1393 (92.8%), 1379 (91.9%), and 1259 (83.9%) study subjects were followed at the 5<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> months of pregnancy, respectively. Birth outcomes were recorded for 1259 study subjects, which amounts to an 83.9% response rate.

The prevalence of IPV at the initial visit was reported to be 29.7%. The levels of prevalence of IPV assessed at each of the follow-up visits are shown in Table 1, which show a declining trend, with the progression of pregnancy. At the third follow-up visit during 9<sup>th</sup> month of pregnancy, 168 out of 1259 study participants (13.3%) reported preterm delivery. 36.9% of these participants with preterm delivery reported IPV at the time of follow-up, which was found to be significantly higher with  $P = <.0001$  [Table 1].

For the pregnancy-associated symptoms and risk factors during the first trimester (e.g., morning sickness, discharge or bleeding per vaginum, fever, rashes, etc.), no significant relationship was found with the occurrence of IPV. Similar results were obtained for associated symptoms and complications during the second trimester. Evaluation of maternal health outcomes revealed that significantly higher proportion (47.2%) of victims of IPV had poor weight gain during pregnancy, compared to 36.4% among nonvictims ( $P < 0.05$ ). Similarly, a significantly higher proportion of victims of IPV reported urinary tract infection (UTI) during first (6.1%) and second (5.0%) follow up visit [Table 2]. The reports of hyperemesis gravidarum, vaginal bleeding, premature rupture of membranes, gestational hypertension and preeclampsia, gestational diabetes, Sexually

transmitted diseases (STD), and antepartum hospitalization were not found to be significantly associated with IPV.

The study participants who reported IPV at any or all of the visits had a higher occurrence of pre-term deliveries (12.7%) compared to 10.5% among study subjects without IPV. This difference, however, was not found to be statistically significant [Table 3]. A significantly higher number of neonates reported low birth weight in relation to presence of IPV during the period of pregnancy (32.1% vs 22.3%,  $p < 0.001$ ).

## DISCUSSION

The prevalence of IPV reported in the study (29.7%), is similar to the global estimates published by the WHO, which state the burden to be 30%.<sup>[1]</sup> The multi-country study by the WHO (2015) reported somewhat lower prevalence of physical and/or sexual violence (during the last 12 months) in similar and neighboring developing countries (22.9% in Thailand, 31.9% in Bangladesh).<sup>[3]</sup> The reported levels were although much higher than the national and state level burden reported in the NFHS-4 survey report, in a similar cohort of pregnant women.<sup>[6,7]</sup> Study in Delhi by Priya *et al.* reported 23.0% prevalence of IPV among pregnant women.<sup>[8]</sup> A study in Mumbai slums by Dasgupta *et al.* reported 29.4% of pregnant women reporting physical and/or sexual violence in the preceding year.<sup>[9]</sup> A facility-based study in Mumbai reported 28.4% of women suffering from IPV during their recent pregnancy.<sup>[10]</sup> A study by Dhar *et al.* in 2018 in Bihar reported a higher IPV prevalence of 45.0%.<sup>[11]</sup> Furthermore, a study in Delhi by Sharma *et al.* reported IPV prevalence to be 43.4% ever in life, and 37.8% in the past 12 months.<sup>[12]</sup> Hence, the findings overall highlight that the prevalence in

**Table 1: Prevalence of various types of intimate partner violence among the study participants**

Intimate partner violence	Initial visit (n=1500), n (%)	First follow-up (n=1393), n (%)	Second follow-up (n=1379), n (%)	Third follow-up (n=1259), n (%)
Present	445 (29.7)	359 (25.8)	339 (24.6)	287 (22.8)
-		72 aborted and 35 were lost to follow-up	4 aborted and 9 were lost to follow-up 22 out of 76 (28.9%) who had abortions suffered from IPV	168 had preterm delivery 62 (36.9%) who had preterm delivery suffered from IPV

IPV: Intimate partner violence

**Table 2: Maternal health outcomes in relation to intimate partner violence**

Physical signs and symptoms	Status of intimate partner violence							
	Initial visit		First follow up		Second follow up		Third follow up	
	Present (n=445), n (%)	Absent (n=1055), n (%)	Present (n=359), n (%)	Absent (n=1034), n (%)	Present (n=339), n (%)	Absent (n=1040), n (%)	Present (n=287), n (%)	Absent (n=972), n (%)
Poor weight gain	210 (47.2)	384 (36.4)	260 (72.4)	733 (70.9)	224 (66.1)	607 (58.4)	181 (63.1)	561 (57.7)
$\chi^2$ , df, P	15.243, 1, <0.0001		0.306, 1, 0.580		6.349, 1, 0.012		2.621, 1, 0.105	
Urinary tract infection	21 (4.7)	35 (3.3)	22 (6.1)	28 (2.7)	17 (5.0)	21 (2.0)	11 (3.8)	20 (2.1)
$\chi^2$ , df, P	1.711, 1, 0.191		9.008, 1, 0.003		8.561, 1, 0.003		2.907, 1, 0.088	

**Table 3: Birth outcomes in relation to intimate partner violence (reported at any visit)**

Birth outcome	Violence reported during any visit		X <sup>2</sup> , df, 'P' value
	Present (n=488)*, n(%)	Absent (n=1012)*, n(%)	
Full term	379 (77.7)	785 (77.6)	2.23,
Preterm	62 (12.7)	106 (10.5)	4,
Abortion	22 (4.5)	54 (5.3)	0.69
Still birth	9 (1.8)	21 (2.1)	
Neonatal death	7(1.4)	11(1.1)	-

\*There were 9 (1.8%) and 35(3.5%) loss to follow up in subjects with and without IPV respectively

the current study is similar to the figures reported in recent studies in similar settings. However, the figures in NFHS-4 show high under-reporting of the experience of violence during any pregnancy.

The findings of significantly higher occurrence of UTI among the sufferers of IPV are consistent with the finding of Faramarzi *et al.* in Iran, who reported a higher odd of UTI among those subjected to physical violence during pregnancy.<sup>[13]</sup> Studies by Gurkan *et al.* and Martin-de-Las-Heras *et al.* in Turkey and Spain also reported urinary infections to be significantly related to IPV.<sup>[14,15]</sup>

The findings of higher occurrence of LBW and preterm deliveries among IPV sufferers in the current study are consistent with the findings by Ahmed *et al.* who conducted a multi-district survey in North India, to study the effects of IPV on perinatal and early childhood mortality and concluded it to be a significant risk factor for the same outcomes.<sup>[16]</sup> In a prospective cohort done in four Indian states, higher perinatal and neonatal mortality were reported among women who experienced two or more episodes of recent violence.<sup>[17]</sup> A significantly increased risk of LBW infants, preterm delivery, and neonatal deaths were reported by Sarkar in a multi-country study, in relation to violence during pregnancy.<sup>[18]</sup> Yost *et al.* reported significantly increased rates of LBW infants, preterm births, or placental abruptions among women subjected to abuse during the period of pregnancy in Texas, USA.<sup>[19]</sup>

The findings in our study are consistent with the above noted national and international studies. A systematic review and meta-analysis done on exposure of IPV and pregnancy and birth outcomes, also found LBWs and preterm births to be increased among women exposed to violence.<sup>[20]</sup> As reported globally by the WHO, women are more likely to experience IPV if they have low education and male privilege.<sup>[3]</sup> Studies have demonstrated that even basic interventions like counseling during the period of pregnancy, of women suffering from IPV, enable them to recognize its impact and take action at an individual level.

Based on the study findings, we conclude that there is evidence that the presence of IPV during the period of pregnancy is

associated with adverse outcomes, which has a negative impact on both the mother's and the child's health. Hence, it is imperative to develop effective programs to identify violence early and intervene, thus, ensuring good health for the mother and child.

The health sector holds the potential to play a pivotal role in the detection and control of IPV by helping in early identification of abuse, along with the appropriate and timely institution of the required treatment or referral, through robust infrastructure and strong referral network. Furthermore, an increase in public awareness and institution of a strong public health response is the need of the hour to prevent IPV against women.

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### Conflicts of interest

There are no conflicts of interest.

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