

ORIGINAL ARTICLE

INTIMATE MATERNAL PARTNER VIOLENCE AND LOW BIRTH WEIGHT IN ADDIS ABABA PUBLIC HOSPITALS

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ABSTRACT

Introduction: There are limited up-to-date studies addressing the relationship between intimate partner violence and birth outcome among women in Ethiopia. This study was, therefore, conducted to examine the association between intimate partner violence during pregnancy and birth weight of newborns.

Methods: The study employed a facility-based case control design and conducted in pregnant women who gave birth in public Hospitals in Addis Ababa during March-June 2014. The study used a pre-tested questionnaire to collect data through face-to-face interviews. Exposure to intimate partner violence and other explanatory factors were examined in a total of 112 neonates with low birth weight and 235 neonates with normal birth weight. The data were analyzed using bivariate and multivariable regression analysis.

Results: The proportion of physical violence by partner was 33.9% among cases and 17.4% among controls, and sexual violence was 41.1% and 18.7% among cases and controls, respectively. After adjusting for socio-demographic factors, obstetric conditions and substance use, the odds of experiencing physical violence (AOR=8.11; 95% CI; (1.92, 34.3)), sexual violence (AOR=6.02; 95% CI; (1.77, 20.5)), and physical or sexual violence (AOR=5.18; 95% CI; (1.53, 17.6)), by intimate partner was significantly higher among cases compared to controls.

Conclusion: Low birth weight is strongly associated with intimate partner violence during pregnancy. We recommend health professionals providing antenatal care services to engage spouses to ensure their understanding and involvement in the prevention of intimate partner violence.

Key words: IPV, Low birth weight, Physical, Sexual Violence.

INTRODUCTION

Violence against women is one of the most pervasive abuses of human rights globally, and women continue to be susceptible to gender based violence, especially during reproductive age (1-4). It has been recognized that women and girls who are marginalized on the basis of factors including economic and social factors are vulnerable to gender based violence (5-7). Intimate Partner Violence (IPV) is the most common form of violence against women (1,8,9). There is no single factor that explains why there is high IPV occurrence in the world; rather complex socio-cultural and economic factors can affect the power relationship between the two sexes seem to be the underlying causes (10, 1).

Although the magnitude of IPV is high during the reproductive age, available evidence depict that the magnitude increases during pregnancy. This of IPV during pregnancy is considered to be due to emerging changes in physical, social, emotional, and economic needs associated with pregnancy (12, 13). Exposure to physical violence during pregnancy can result in serious health consequences for both the mother and the fetus (12,14-16). IPV during pregnancy is a pervasive problem that increases woman's vulnerability to unfavorable birth outcomes (17-21). Pregnant women exposed to IPV are more likely have

preterm birth (12), psychosocial stress, and higher levels of cortisol than those not exposed (22-24), a condition that affects foetal growth. An understanding of the effect of IPV in pregnant women could have important reproductive health implications. It could help in early identification of the potential risks and in shaping future intervention programs. As in many developing countries, there is scarcity of information on the effect of IPV on pregnancy outcomes in Ethiopia. Therefore, this study examined the relationship between IPV experienced during pregnancy and the occurrence of low birth weight.

PATIENTS AND METHODS

Study setting: The study was conducted in Addis Ababa, the capital city of Ethiopia, which has an estimated population of 2,738,248 and a population density of 5,607.96 people per square kilometers (25). According to the 2003 Health and Health Related Indicators, Addis Ababa had 33 Hospitals, 52 Health Centers and 35 Health Posts in the public sector (26). Delivery services managed by midwives are available in almost all health facilities, but hospitals also had skilled physicians (26). Delivery services at public facilities are provided free-of charge to mothers, costs covered by the government (27). Newborn weights were routinely measured and recorded in log books.

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Study design: The study involved three public hospitals (Zewditu Memorial, Yekatit 12 and Mahatma Ghandi Memorial hospitals) and conducted during March - June 2014. A case control study design was used to compare low birth weight among neonates born to mothers exposed and not exposed to IPV during pregnancy.

Source population: The source population constituted pregnant women attending delivery services at public health facilities and the study population mothers who delivered at these facilities. Cases were singleton, live neonates born at term with birth weight of < 2500 grams and those with birth weight of \geq 2500 grams were used as controls. Newborns of mothers with chronic illness (diabetes mellitus, cardiac illness, hypertension) and stillborn were excluded from the study.

Sample size and sampling technique: The sample size was calculated using the formula to determine proportion in two populations, with an assumption of prevalence of IPV in the general pregnant women of 28% (28). The calculation also assumed a two-fold increase in the odds of experiencing IPV among cases compared to controls, and set a case controls ratio at 1:2, a 95% confidence level, and study power of 80%. With the above assumptions and an allowance for non-response of 5% added, the sample size 122 cases and 244 controls was determined.

All mothers who delivered in one of the three hospitals and met the inclusion criteria were considered for interview. The three hospitals were selected due to the higher number of deliveries than in other Facilities in the City. The sampling of cases and controls was done proportionate to delivery service load and the recruitment of eligible study subjects was done serial and stopped when the numbers allocated to each facility was achieved. For each case, the next two consecutive controls who also met the inclusion criteria were selected. No replacement of eligible mothers was made.

Data collection: Data was collected by face-to-face interview using structured questionnaire and review of the medical record of the mothers and their newborn. Six experienced nurses were involved as enumerators. They received a two-day training on the objective, the instrument and maintenance of privacy and confidentiality. The questionnaire was prepared in Amharic, and used after it was pre-tested in Tikur Anbesa Specialized Hospital. The data were checked for completeness and consistency by the principal investigator.

The outcome variable was low birth weight and the primary explanatory variable was exposure to IPV during pregnancy. Other explanatory variables considered included socio-demographic characteristics, maternal obstetric history and substance abuse. Birth weight was measured in grams using a pre-calibrated weight scale within one hour of delivery. Exposure to IPV was con-

sidered if the women had experienced physical violence during the last pregnancy, including being hit, slapped, kicked or physically hurt by their spouses. Exposure to sexual violence, was considered if during the pregnancy the women had experienced sexual intercourse without their consent, the definition used in the WHO multi-country study (28). The socio-demographic characteristics included age, educational status, residence, marital status, occupation and religion. Maternal obstetric history included parity, birth intervals, history of abortion and ANC visit. Substance use during the current pregnancy included alcohol drinking, khat chewing, cigarette smoking, shisha smoking, cannabis use and other substances.

Data cleaning and analysis: Data was entered onto EPI-DATA version 3.1 software package. On completion of data entry, the data were cleaned by correcting outlier entries, and were analyzed using SPSS for windows. The analysis involved binary and multivariable regression analysis to assess for existence and strength of association between low birth weight and IPV as well as with the other explanatory variables considered in the study.

Ethical Consideration: Ethical clearance was obtained from the Research and Ethics Committee of School of Public Health, Addis Ababa University. The study was conducted in the selected health facilities after permission was obtained. Verbal informed consent was obtained from participants, after they were informed regarding the purpose, procedures, potential risks and benefits of the study and absence of denial of health service for refusal. They were also assured of strict confidentiality with regard to any information collected from them. Each participant was informed of the right to refuse, ask any question. Data was obtained after 8-12 hours of delivery, when they were comfortable.

RESULTS

Socio-demographic characteristics of the respondent: A total number of 112 cases and 235 controls participated in the study, making the response rate 91.8% among cases and 93.3% in controls. Majority of the respondent were between the age group of 15-29 years. Both cases and controls had higher proportion of the Orthodox faith. Nearly one-half of the mothers were housewives. Educational status ($X=26.625$, $P<0.001$) and monthly income ($X=8.257$, $P<0.04$) of mothers was inversely associated with low birth weight. There was no statistically significant difference between cases and controls in age distribution, religion, marital status and occupations of the mother as well as the father, (Table 1). Obstetric history of the respondent: Majority of the mothers had less than 3 children. History of abortion was reported by one in five of the study subjects. More than 80% of the respondents had visited ANC clinic, four or more times. Majority of mothers in the two groups had received Iron supplement.

Table 1: Socio-demographic characteristics of mothers who gave birth in Addis Ababa Public Hospitals, February 2017

Characteristics	Case (n-112) Number (%)	Control (n-112) Number (%)	Statistic	P-value
Age				
15-24	46 (41.1)	95 (40.4)	$X^2=3.261$	$P>0.05$
25-29	49 (43.8)	86 (36.6)		
30+	17 (15.2)	54 (54.0)		
Education				
Never educated	22(19.6)	8 (03.4)	$X^2=26.625$	$P < 0.001$
Elementary (1-8)	41 (36.6)	87 (37.0)		
Secondary or more (9+)	49 (43.8)	140 (59.6)		
Religion				
Orthodox	82 (73.9)	171 (73.4)	$X^2=0.56$	$P>0.05$
Muslim	18 (16.2)	37 (15.9)		
Protestant	11 (9.9)	25 (10.7)		
Occupation of the mother				
House wife	51 (48.5)	101 (43.0)	$X^2=3.187$	$P>0.05$
Government employee	10(8.9)	37 (15.7)		
Private sector employee	27 (24.1)	53 (22.6)		
Merchant	16 14.3)	31 (13.2)		
Other	8 (07.1)	13 (05.5)		
Occupation of the husband				
Government employee	19(17.9)	50 (22.8)	$X^2=2.123$	$P>0.05$
Private sector employee	47(44.3)	95 (43.4)		
Merchant	31(29.2)	51 (23.3)		
Other	9(08.5)	23 (10.5)		
Income				
Unknown	33 (29.5)	42 (17.9)	$X^2=8.257$	$P<0.04$
<1500 birr	24 (21.4)	46 (19.6)		
1500-2999 birr	29 (25.9)	65 (27.8)		
≥3000birr	26 (23.2)	82 (34.9)		

A higher proportion of cases than controls had history of less than two years of birth interval, ($X^2=12.3$; (df=1); $P<0.001$). Similarly, 19(17.9%) of cases and 13(6.2%) of controls reported to have history of lower birth weight than in their previous delivery ($X^2=10.557$; (df=1); $P<0.0001$). Moreover, 12(10.8) of cases and 89 (37.9%) of controls got weight gain of 10 kilo grams or more during the pregnancy time, therefore, weight gain during pregnancy was inversely associated with low birth weight, ($X^2=26.7$, $P<0.0001$). However, parity, history of abortion, ANC visit status, and receiving iron supplementation during pregnancy were not associated with low birth weight of the neonate (Table 2).

Table 2. Obstetric history of mothers who gave birth in Addis Ababa Public Hospitals, February 2017

Variable	Case (n-112) Number (%)	Control (n-112) Number (%)	Statistic	P-value
Parity				
<3 children	102 (91.1)	204 (86.8)	$X^2= 1.323$	P>0.05
≥ 3 children	10 (08.9)	31(13.2)		
History of underweight birth				
Yes	19 (17.9)	13 (06.2)	$X^2=10.557$	P< 0.001
No	87 (82.1)	196 (93.8)		
History of abortion				
Yes	22 (19.6)	46 (19.6)	$X^2=0.00$	P<0.05
No	90 (80.4)	189 (80.4)		
Iron supplement				
Yes	205(87.2)	93 (83.0)	$X^2=1.102.$	P>0.05
No	30 (12.8)	19 (17.0)		
Weight gain during pregnancy				
<10 KG	99 (89.2)	29 (62.1)	$X^2=26.7$	P<0.0001
≥10 Kg	12 (10.8)	89 (37.9)		
Gestational age				
Below37weeks	23(20.5)	29 (12.3)	$X^2=4.019$	P>0.05
37-42 weeks	80 (71.4)	184 (78.3)		
Above 42 weeks	9 (08.0)	22 (09.4)		
Inter pregnancy interval				
< 2 years	24 (52.2)	21 (22.6)	$X^2=12.3$	P<0.001
≥ 2 years	22 (47.8)	72 (77.4)		
Number of ANC visit				
≥4	85 (75.9)	205 (87.2)	$X^2=7.107$	P=0.08
<4	27 (24.1)	30 (12.8)		
Gestational age at first visit				
Before16weeks	87 (79.8)	174 (78.4)	$X^2=0.091.$	P>0.05
After 16weeks	22 (20.2)	48 (21.6)		

Behavioral factors (substance use) among study subjects: Out of 346 study subjects 32 (28.6%) of the cases and 23(9.8%) of the controls were using Khat during last pregnancy. Moreover, 61(54.4%) of the cases and 105 (44.5%) controls reported to drink alcohol while 17 (15.2%) cases and 1(4%) of the controls reported to smoke tobacco during the last pregnancy. Twenty (17.9%) of the cases and 3 (1.3%) of the controls had practiced smoking shisha during the pregnancy.

Similarly, among the respondents, 15(13.4%) of the cases and 14 (6%) of the controls reported their partners to smoke cigarette during their last pregnancy. None of the study participant reported to use other illicit drugs during the last pregnancy (Figure 1).

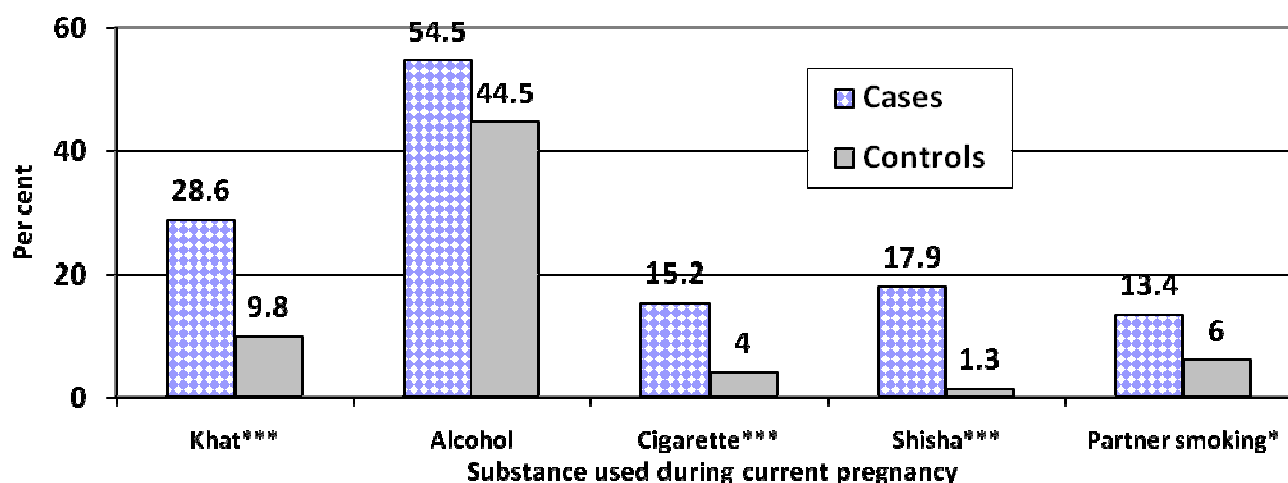


Figure 1: Life style/personal habit during pregnancy of mothers (112 cases and 235 controls) who gave birth in Addis Ababa public hospitals, February 2017

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$

Table 3: Low birth weight of newborns by maternal exposure to intimate partner violence during pregnancy in Addis Ababa public hospitals, February 2017.

Type of violence	Cases Number (%)	Control Number (%)	Crude OR (95%, CI)
Physical Violence			
No	74 (66.1)	194 (82.6)	1.0
Yes	38 (33.9)	41 (17.4)	2.43 (1.45, 4.07)
Sexual Violence			
No	66 (58.9)	191 (81.3)	1.0
Yes	46 (41.1)	44 (18.7)	3.03 (1.84, 4.98)
Physical or sexual Violence			
No	62 (55.4)	177 (75.3)	1.00
Yes	50 (44.6)	58 (24.7)	2.46 (1.53, 3.96)

After it was adjusted for substance abuse, experience of sexual violence and experiencing physical or sexual violence during pregnancy was associated with low birth weight. Similarly, after adjusting for educational level, income, history of underweight birth and inter-pregnancy interval, the chance of experiencing physical violence, (AOR=5.45;95%CI(1.68,17.6)), sexual violence (AOR=5.87;95%CI (1.90,18.17)) and physical or sexual violence (AOR=4.11;95%CI (1.44,11.7)) during pregnancy was significantly higher among cases compared to controls.

Adjusting both for socio-demographic, obstetric correlates and substance use, the odds of experiencing of physical violence, sexual violence and physical or sexual violence by intimate partner was significantly higher among cases compared to controls (Table 4).

Table 4: Adjusted association of maternal exposure to intimate partner violence in mother with low birth weight of newborns in Addis Ababa public hospitals, February 2017

Type of violence	Adjusted ¹ OR (95%, CI)	Adjusted ² OR (95%, CI)	Adjusted ³ OR (95%, CI)
Physical Violence			
No	1.0	1.0	1.0
Yes	5.45 (1.68, 17.6)	1.68 (0.95, 2.97)	8.11 (1.92, 34.3)
Sexual Violence			
No	1.0	1.0	1.0
Yes	5.87 (1.90, 18.17)	2.34 (1.36, 4.02)	6.02 (1.77, 20.5)
Phys. or sexual Violence			
No	1.00	1.0	1.0
Yes	4.11 (1.44, 11.7)	1.84 (1.09, 3.10)	5.18 (1.53, 17.6)

Adjusted¹ adjusted for educational level, income, history of underweight birth and inter-pregnancy interval;

Adjusted² adjusted for, khat chewing cigarette and Shisha smoking; and Adjusted³ adjusted for Educational level, income, history of underweight birth, inter-pregnancy interval, khat chewing Cigarette smoking and shisha smoking and partner cigarette smoking.

DISCUSSION

The findings of this study attained presence of an association, indicative of consistency with previous research. The study found presence of statistically significant association between low birth weight and maternal experience of intimate partner violence such as experience of physical, sexual and physical or sexual violence by intimate partner during pregnancy. Low birth weight was associated with maternal education, and the association was strong and this may be explained by the knowledge educated women may have to enable them to care their child through appropriate diet and care during pregnancy resulting on higher birth weight than the non-educated women (24).

In this study, women with inter pregnancy spacing less than two years were more prone to having lower birth weight, and this observation concurs with previous reports (25-27). This indicates that the previous pregnancy may have adverse effect on the birth weight of the subsequent pregnancy. Substance use including khat chewing, and cigarette and shisha smoking during pregnancy are independently associated with low birth weight, and this is consistent with findings of previous studies (29-31). The effect of khat chewing on low birth weight may be due to the vaso-constrictive effect of the amphetamine gradient of khat on the placental blood circulation (29,32). The strong association between shisha smoking and low birth weight is supported by the reports of previous studies, (30,33). The systematic review and meta-analysis done by Leonardi-Bee, J. et.al. in 2008 actually affirmed the well-known fact about the effect of cigarette smoking being a determinant of lower birth weight (31).

In this study, we analyzed the association between birth weight and the different forms of intimate partner violence during pregnancy. Maternal experience of physical or sexual violence by intimate partner during pregnancy was significantly associated with low birth weight. This finding is consistent with the finding of many studies (34-36), and the association may well be attributed to a number of direct and indirect mechanisms. It may be related direct to abdominal trauma that may damage the placenta, resulting to a premature uterine contractions, including low birth weight. There is also a growing evidence for the role of the hypothalamic-pituitary-adrenal axis (HPA) in mediating low birth weight among women exposed to IPV. This is explained by the increment in circulating cortisol level, a stress hormone, which passes trans-placental barrier to the fetus, resulting in a premature delivery or low birth weight (37, 38).

The association of intimate partner violence and low birth weight could be explained indirectly, as a consequence of stressing effect of IPV(39), could more likely to end to poor maternal health, low self-efficacy and social support, a variety of poor birth outcomes, of which low birth weight is one (40). The association of experiencing IPV with increased chance of developing maternal mental illness(11) and low socioeconomic status (41), may predispose the mother to having low birth weight newborns.

Although the study has some strengths, as an observational design, it could not be pure of limitations. Although, case control designs do not show temporal relationship of cause-and-effect relationship, this study has shown it by using experience of intimate partner violence, during pregnancy proceeded by birth weight immediately

after birth. Selection bias which is frightened in most of case control designs, has been tried to minimize through sticking to protocol in selection of study subjects, and the absence of difference of the socio-demographic characteristics between cases and controls depicts that selection bias is less likely to occur in this study, therefore, this study paves to generate possible valid baseline information.

One of the limitation most likely to occur in this study is inclusion of information bias. This might appear from the self-report of experiencing IPV, which might introduce social desirability response. However, since the limitation is non-differential, the observed result may be obscured to the null, so the true finding may be higher than what is found in this study.

Conclusion/ Recommendation: Low birth weight is statistically significantly and independently associated with exposure of pregnant women to any form of intimate partner violence. Therefore, promotion of interventions that minimizes the occurrence of intimate partner violence should be designed and implemented. Health professionals working in antenatal care service should be given training on couple counseling in order to substantially reduce the occurrence of intimate partner violence during pregnancy.

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