

The Relationship between Abuse during Pregnancy and Pregnancy Outcomes: An Overview of Meta –Analysis

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Abstract

Background

Violence against women is a social, legal and health problem that poses a threat to mother and child in pregnancy. The present overview was conducted to review of Meta-analysis that assessed the line between the abuse on mother during pregnancy and pregnancy outcomes.

Materials and Methods: This study reviewed all published articles from January 1996 to March 2018 by searching International databases such as Scopus, EMBASE, Medline (via PubMed), Google Scholar, Web of Sciences, and Cochrane library for related Meta-analysis. Also, along with international databases, national databases such as SID, Magiran, Medlib and Irandoc were searched. Two independent researchers screened articles and in the next step, full texts of probably relevant articles were read and summarized. There was not any language limitation.

Results: Data from 5 Meta- were entered. A significant relationship was found between abuse during pregnancy and Low birth weight (LBW) (odds ratios [OR] ranged from 2.11 to 1.18; five Meta-analysis), and preterm birth (PTB) (OR ranged from 1.21 to 1.91). According to one Meta-analysis, intimate partner violence (IPV) was statistically marginally associated with small-for-gestational-age (SGA) infants (OR: 1.37, 95% confidence interval [CI]: 1.02 to 1.84; Heterogeneity I²: 84%; I²: 32%), but there was not any relationship between IPV with Intrauterine growth restriction (IUGR) (P>0.05).

Conclusion

Our overview showed that the pregnant women who expose to domestic violence are at increased risk of an adverse pregnancy outcomes such as preterm birth', low birth weight' and small for gestational age' infants. So, intervention such as screening and counseling for violence is needed for all pregnancy women especially previous victims of violence.

Key Words: Abuse, Intrauterine growth restriction, Low birth weight, Pregnancy outcome, Violence.

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1- INTRODUCTION

Domestic violence is defined as any acts of physical or emotional violence that causes physical harm, sexual assault or coercion, intimidating or threatening to kill or harm, preventing normal individual freedoms, lack of permission access to services, and violence against women by a partner (1, 2). The violence occurs in various forms in different environments such as school, workplace and community, but the family violence, called as domestic violence, is the most common form of violence. The family violence appears in various types, such as violence on children, men, women and the elderly, but the violence between couples, and in particular violence on women, is one of the most common types of domestic violence (3). Women's health is certainly a way to achieve overall health purposes and improve the quality of life of all people; the female health status has an important impact on the health of children, family, society and environment (4).

According to international statistics, at least one out of five women is at the risk of experiencing intimate partner violence during her lifetime (5). A meta-analysis on 32 articles with 15,610 women in Iran reported 52% prevalence (95% confidence interval [CI]: 43 to 62) for domestic violence during pregnancy (6). The pregnancy not only does not protect women against violence (7), but also can be a point for initiating or sometimes exacerbating domestic violence against a pregnant woman for a variety of reasons, such as reducing sexual relations, misconceptions on pregnancy, and abnormal emotions of husband towards pregnancy. The domestic violence on the pregnant women can lead to complications and problems, such as acute injuries, organ dysfunction, persistent disabilities, nutritional disorders, sleep problems, stress disorders, depression, drug abuse and suicide (5). The domestic violence during

pregnancy, in addition to mother, can directly or indirectly affect the fetal health, including abortion, premature rupture of the membranes, low Apgar score, fetal death, preterm delivery, low birth weight, delayed referral for prenatal care, drug overuse, miscarriage, vaginal bleeding, preeclampsia, dystocia and postpartum depression (5, 7-13). Numerous studies have shown that parental violence has put children at risk of behavioral, emotional and cognitive problems and resulted in a short and long term outcome. Previous investigations have shown that the violence on a legal wife during and after pregnancy can predict a child abuse and neglect by parents (9). Researchers believe the domestic violence during and after pregnancy may negatively affect the fetal health, and also the social and the emotional development of the infants (14-16). Many studies have evaluated some links between pregnancy outcome and abuse. Donovan et al. in their meta-analysis assessed association between intimate partner violence during pregnancy and low-birth weight (LBW), preterm birth (PTB), and small-for-gestational-age (SGA) (17). Three meta-analysis assessed association between violence and LBW (2, 18). Fifth meta-analysis assessed relation between PTB and Intrauterine growth restriction (IUGR) with intimate partner violence (IPV) (19). Therefore, aim of overview of meta-analysis was to provide comprehensive evidence of association between pregnancy outcome and violence.

2- MATERIALS AND METHODS

2-1. Method

The present overview of Meta-analysis was conducted to review the relationship between the domestic violence on mother during pregnancy and pregnancy outcomes. The results of this study were based on the articles published in national and international databases. This study reviewed all published articles from

January 1996 to March 2018 by searching International databases such as Scopus, EMBASE, Medline (via PubMed), Web of Sciences, Google Scholar, and Cochrane library for related meta-analysis. Also, along with, National databases such as SID, Magiran, Medlib and Irandoc were searched. There was not any language limitation. Keywords of search were ("meta-analysis" AND "abuse" OR "violence" OR "emotional abuse" OR "intimate partner violence" OR "battering" OR "domestic violence" OR "spouse abuse" OR "wife abuse" OR "coercion" OR "family violence" OR "conflict tactics scale" OR "IPV") AND ("Premature Birth" OR "premature births" OR "premature rupture of membranes" OR "PROM", OR "low birth weight" OR "LBW" OR "small for gestational age" OR "SGA").

2-2. Search strategy

After choosing appropriate keywords and their combinations, an extensive search was done in International and National databases until March 2018; and a manual search was performed through three steps: 1) Assessing bibliography of relevant studies, 2) Contacting authors in order to get access to unpublished data, and 3) search for relevant theses in ProQuest database.

2-3. Inclusion criteria

We selected Meta-analysis of observational studies (cohort, case-control and cross-sectional). Also, we focused on pregnant women exposed to violence as victim.

2-4. Quality of studies data extraction

The quality of the articles was assessed using the 11-item AMSTAR developed by Oxman et al. (20). Each item was responded by "Yes", "No", and "Can't Answer". The 11- item were:

1 "Was an 'a priori' design provided?"

2 "Was there duplicate study selection and data extraction?"

3 "Was a comprehensive literature search performed?"

4 "Was a list of studies (included and excluded) provided?"

5 "Was the status of publication (i.e. grey literature) used as an inclusion criterion?"

6 "Were the characteristics of the included studies provided?"

7 "Was the scientific quality of the included studies assessed and documented?"

8 "Was the scientific quality of the included studies used appropriately in formulating conclusions?"

9 "Were the methods used to combine the findings of the studies appropriate?"

10 "Was the likelihood of publication bias assessed?"

11 "Was the conflict of interest stated?"

At first, all the Meta- analysis on the abuse during pregnancy and low birth weight were collected. Two independent researchers screened articles and in the next step, full texts of probably relevant articles were read and summarized. There was not any language limitation.

3- RESULTS

The aim of current overview was to provide comprehensive evidence of association between pregnancy outcome and abuse during pregnancy. Five meta-analyses were included in the overview. Process of selecting five Meta-analyses included into the overview is shown in **Figure.1**. Assessment of methodological quality of systematic review is shown in **Table.1**.

The *first* Meta-analysis performed by Donovan et al. in 2016. They assessed association between intimate partner violence (IPV) during pregnancy and low-birth weight (LBW), preterm birth (PTB), and small-for-gestational-age (SGA) infants and showed a significant association between LBW (unadjusted

odds ratios [OR]: 2.11, 95% CI: 1.68 to 2.65; Heterogeneity $I^2=91\%$), and PTB (OR: 1.91, 95% CI: 1.60-2.29; Heterogeneity $I^2=84\%$). A high level heterogeneity was observed cross studies assessed LBW and PTB. IPV was statistically marginally associated with SGA (OR: 1.37, 95% CI: 1.02 to 1.84). Subgroup analysis was conducted bases on study design, type of violence and income status. Unadjusted OR for low/middle-income countries in cohort studies was (OR: 1.82; 95% CI: 1.33-2.48; Heterogeneity; I^2 : 85%; 17 studies), in cross-sectional studies (OR: 1.66; 95% CI: 1.17-2.36; Heterogeneity; I^2 : 89%; 7 studies), in case-control studies (OR: 1.06; 95% CI: 0.57-1.99; Heterogeneity; I^2 : 38%; 3 studies). Unadjusted OR for high middle/middle countries in cohort studies was (OR: 3.87; 95% CI: 0.98-15.29; Heterogeneity; I^2 : 96%; 6 studies), in cross-sectional studies (OR: 2.70; 95% CI: 1.85-3.94; Heterogeneity; $I^2=52\%$; 6 studies), in case-control studies (OR=2.98; 95% CI: 0.90-9.89; Heterogeneity; I^2 : 74%; 2 studies) (17).

The *second* Meta-analysis was conducted by Karimi et al. in 2016 (18). They assessed the relationship between violence during pregnancy and LBW. This Meta-analysis conducted on 16 published studies in Persian and English databases. The

result of their meta-analysis showed there was a significant association between three type of violence including physical violence (OR: 1.61; 95% CI: 1.04-2.28), psychological (OR: 1.26; 95% CI: 1.02-1.56), and sexual violence during pregnancy (OR: 1.26; 95% CI: 1.02-1.56) was significantly associated with LBW (21).

In the *third* Meta-analysis by Murphy et al., a significant relationship was observed between all types of violence (physical, sexual and emotional abuse) during pregnancy and LBW (OR: 1.36; 95% CI: 1.06 -1.75) (18).

In the *fourth* Meta-analysis by Shah et al. (2), the relationship between maternal exposure to domestic violence during pregnancy and pregnancy outcomes were evaluated. Adjusted OR was 1.53 (95% CI: 1.28 to 1.82) for LBW, and for preterm birth (OR: 1.46, 95% CI: 1.27- 1.67).

In the *fifth* Meta-analysis, Hill et al. conducted a Meta-analysis in 2016. They concluded that IPV was significantly associated with increased risk of preterm birth (OR: 1.42; 95% CI: 1.21-1.63), LBW (OR: 1.18; 95% CI: 1.05-1.31), but relationship between Intrauterine growth restriction (IUGR), and IPV was not significant (19).

Table-1: Assessment of Methodological quality of systematic review using the AMSTAR items

Authors years Reference	AMSTAR Items										
	1	2	3	4	5	6	7	8	9	10	11
Donovan et al. 2016, (17)	Yes	Yes	Yes	Yes	Yes	No	Can Not Answer	Yes	Yes	Yes	NO
Murphy et al. 2001, (18)	Yes	NO	Yes	Yes	NO	Yes	Can Not Answer	Yes	Yes	Can Not Answer	No
Shah et al 2010, (2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Karimi et al. 2016, (21)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hill et al. 2016, (19)	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

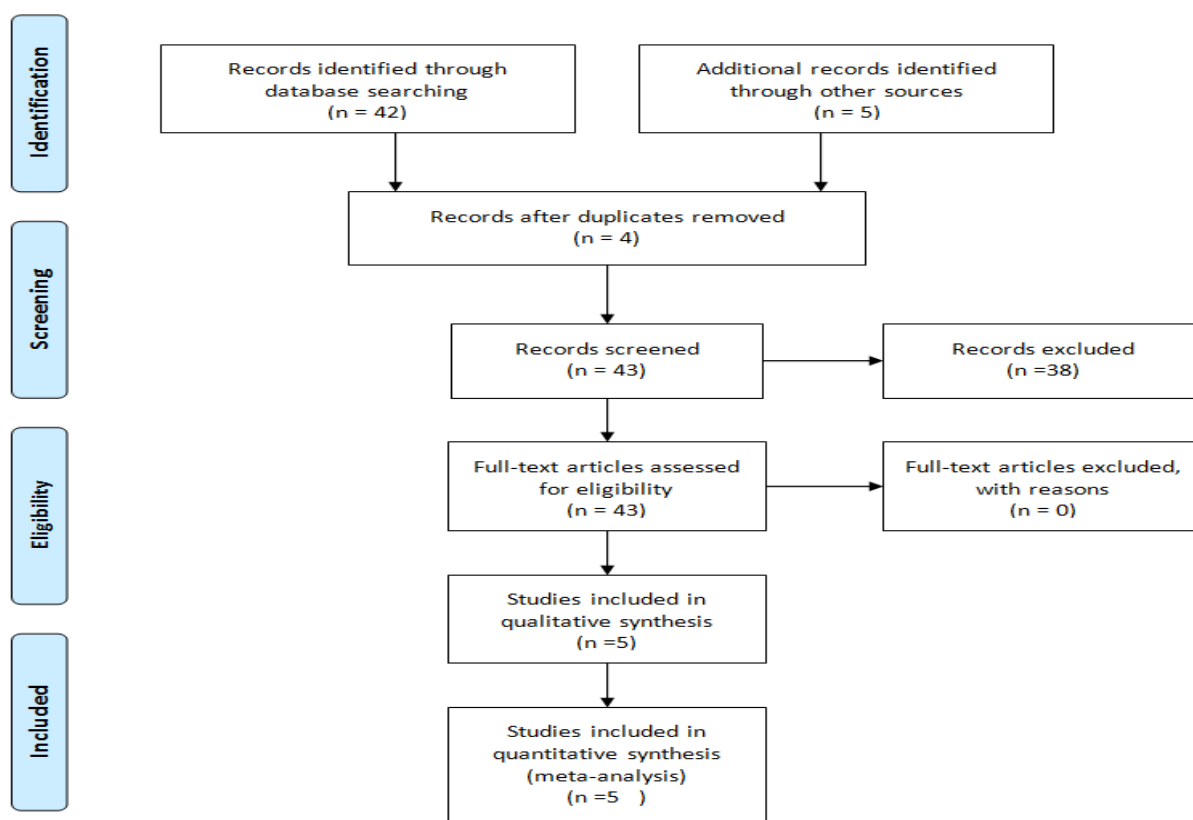


Fig.1: Flowchart of included studies.

4- DISCUSSION

The prevalence of intimate partner violence during pregnancy is in a range from 2% in Denmark, Australia, Cambodia and Philippines, to 13.5% in Uganda (22). A Meta-analysis were performed in 2018 on 32 study involving 15,610 Iranian pregnant women and reported a 50% prevalence among these women (6). The violence during the pregnancy can negatively affect both mothers and infant. Complication on mothers consist of acute injuries, organ dysfunction, nutritional disorders, sleep problems, stress disorders, depression, drug abuse and even suicide (5). As well as mother, the violence during pregnancy also can have side effect on the fetal health. These including abortion, premature rupture of the membranes, low Apgar score, fetal death, preterm delivery, low birth weight, delayed referral for prenatal care, drug overuse, miscarriage, vaginal bleeding, preeclampsia, dystocia and postpartum depression (5, 7-13). With

regarding prevalence of violence during pregnancy in all over the world and complication on infants; therefore, it is important to assess the effect of abuse during pregnancy on pregnancy outcome. To best our knowledge, this is the first overview of Meta-analysis assessing the relationship between pregnancy outcome and violence during pregnancy. Primary outcome was relation between LBW and violence during pregnancy. Secondary outcome was IUGR, SGA, and preterm birth. All types of observational Meta-analysis (cross-sectional, cohort and case-control) were included into overview. The result of overview showed that there was a significant relationship between LBW, SGA, and preterm birth with abuse. There was not any significant relationship between abuse during pregnancy and IUGR. In comparison with other meta-analysis (2, 18, 21), in Donovan et al.'s Meta-analysis (17), a much stronger association between LBV and PTB with

IPV was identified. They contributed it to comprehensive search that caused to identify large number of studies with high quality. Abuse on mother during pregnancy can be also effective in the incidence of preterm birth and low birth weight through various direct and indirect mechanisms. The physical violations directly on the abdomen or forced sex can cause adverse effects in the pregnant women, including placenta injury, uterine contractions, premature rupture of membranes and genitourinary infection (17). Violence either through physical and sexual trauma or through the release of stress-related hormones can lead to preterm birth and low birth weight. When stress the neuroendocrine channel with the hypothalamus-pituitary-adrenal axis begins to produce cortisol hormone simultaneously in the mother and the fetus. The cortisol can increase the incidence rate of infection, preterm birth and low birth weight via reducing mother's and child's immune system (5).

On the other hand, physical and mental symptoms, anxiety, inadequate care, and lack of social support, which sometimes occurs following the violence, may affect the attitude of the woman, her tolerance, and her level of attention to health, consequently increasing the likelihood of risky behaviors the maternal and fetal health, such as smoking, alcohol, non-referral to health centers for getting pregnancy care. Therefore, the process of pregnancy, childbirth and postpartum periods will deteriorate within a reverse cycle (5). There were few limitations that must be addressed. Pervious met analysis showed that subgroup based on that design (cross sectional, case-control and cohort), income status of country and quality of studies and type of violence may have the effect on result and degree of heterogeneity. In Donovan et al.'s meta-analysis, pooled odds ratios for SGA showed a slight increase in women

experienced more than one type of IPV and psychological and physical violence (17). In Meta-analysis performed by Karimi et al., odd ratios for LBW was to some extent larger in women experienced physical violence than physiological and sexual violence (21). Future work should be conduct subgroup analysis based on mentioned factors to explore reason for heterogeneity.

5- CONCLUSION

The current overview showed that the pregnant women who expose to domestic violence are at increased risk of an adverse pregnancy outcomes such as preterm birth', low birth weight' and small for gestational age' infants. So, intervention such as screening and counseling for violence is needed for all pregnancy women especially previous victims of violence.

6- CONFLICT OF INTEREST: None.

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