Iranian Red Crescent Medical Journal

ORIGINAL ARTICLE

Relationship between Violence during Pregnancy and Postpartum Depression

M Dolatian[1]*, K Hesami[1], J Shams[2], H Alavi Majd[3]

[1]College of Nursing and Midwifery, [2]Department of Psychiatry, Neurology Research Center, [3]Department of Biostatistics, Shaheed Beheshti University of Medical Sciences, Tehran, Iran

Abstract

Background: Due to the lack of evidence in relation to violence against pregnant women, particularly in developing countries, this study was conducted to determine the relationship between violence during pregnancy and postpartum depression in Marivan, western Iran.

Methods: 240 women between 15 and 40 years at the last month of their pregnancy were selected and divided into two groups: those experiencing violence and those without and matched for age, education, occupation of their own and their husbands', income, marital status, parity and desired or unwanted pregnancy. They were followed 2 to 6 weeks after delivery. Participants were Iranian Kurd, literate and singleton with no known pregnancy complications and depressive disorder in their lifespan. Demographic and obstetrical characteristics, Edinburg's postpartum depression, violence in three domains of physical, sexual, and emotional were recorded in a questionnaire.

Results: Mean age of subjects was 26.02±5.53 years mostly in primary educational level and were housewives. The scores of Edinburg's questionnaire ranged from 0 to 27 (8.25±6.82) and 34.2% (82 women) of them obtained score 10 or more. The frequency of postpartum depression was 52.5% and 15.8% in women experiencing violence and those without, respectively. A significant relationship was found between domestic violence and postpartum depression (p<0.001) and the estimation of relative risk of depression with 95% confidence interval was between 2.1 and 5.1 (RR=3.3).

Conclusion: Based on adverse effects of violence during pregnancy in this study, a routine screening at perinatal clinics is suggested to identify at-risk cases and provide necessary health services.

Keywords: Violence; Sexual violence; Emotional violence; Pregnancy; Postpartum depression

Introduction

Domestic violence is the most common type of violence and a significant health problem. At least, 45% of women experience it.[1] Different types of violence include physical, sexual and emotional or psychological, which are interdependet.[2] Pregnancy has been identified as a 'high-risk' period for abuse which may be initiated or accelerated during pregnancy.[3-5] Common prevalence rates reported in research studies vary from 1% to 30%, depending on the type of abuse surveyed, the instrument used for data collection, the degree to which women disclose abuse status, and the time of data collection during the childbearing period.[2,6]

It is considered a crisis for victims because, in addition to severe physical and emotional outcomes for them, it adversely influences the health of their fetuses and their newborns after birth.[2,7] Unwanted pregnancy, delay in seeking for prenatal care, inappropriate weight gain, abortion, premature labor, placental detachment, low birth weight, decreased mobility and growth of the fetus, false labor, malnutrition, anemia, crimes, sexually transmitted diseases, alcohol as well as drug abuse, sleep problems, chronic panic syndrome, anxiety, depression and suicide are more commonly seen in women experiencing violence.[2-4,7]

***Correspondence:** Mahrokh Dolatian, MSM, College of Nursing and Midwifery, Shaheed Beheshti University of Medical Sciences, Tehran, Iran. Tel: +98-21-88883133, Fax: +98-21-88883133, e-mail: mhdolatian@Yahoo.com

Received: July 10, 2009 Accepted: December 21, 2009

Complications of violence during pregnancy may predispose women to physical and emotional problems in future. Violence, therefore, can be one of the intervening factors leading to postpartum depression.[3,8] Postpartum depression is a major psychological problem and one of the most important and common complications of childbearing that occurs in %10-%15 of women in the first 3 months postpartum.[9,10]

In general, the clinical manifestations of postpartum depression include severe changes in sleeping, eating, and activity patterns. Additional symptoms to look for include anxiety, intense irritability or anger, feelings of guilt, a sense of being overwhelmed, feelings of being a failure as a mother, and changes in libido that exceed what is expected.[9] The most significant factor in the course of the depression is delay in diagnosis and treatment.[10] If undiagnosed, it can adversely affect the mother–infant relationship and lead to long-term emotional problems for the child.[9]

It may reflect domestic violence and result in communication problems and more violence.[8] Growing awareness regarding domestic violence during pregnancy has led to run some organizations such as The American College of Obstetricians and Gynecologists, The American Medical Association, and various public agencies.[11] Since domestic violence may reflect culture of a society, research is needed to clarify the relationship between different types of domestic violence (i.e., psychological, physical and sexual violence) and mental health outcomes particularly in developing countries where relatively little research is available.[12]

This study was conducted to determine the relationship between domestic violence and postpartum depression in women referring to health centers of Marivan, western Iran in 2007.

Materials and Methods

Two hundred and forty women between 15 and 40 years at the last month of their pregnancy were selected and followed for 2 to 6 weeks after delivery. They were Iranian Kurd, literate and singleton with no known pregnancy complications and depressive disorder in their lifespan. They were matched in two groups in terms of age, education, occupation of their own and their husbands', income, marital status, parity and desired or unwanted pregnancy and no significant difference was observed. Quota sampling method was first used to identify the number of subjects allocated to each health center of Marivan, and then convenient sampling was applied to select women referring to the centers.

The data collection tools included a questionnaire in two parts: 1. demographic and 2. obstetrical characteristics, (Edinburg 's postpartum depression questionnaire) and a violence questionnaire in three domains: physical, sexual, and emotional (a combination of questionnaires in other studies including Abuse Assessment Screen, Abusive Behavior Inventory, Composite Abuse Scale (CAS), Measure of Wife Abuse, Revised Conflict Tactics Scales (CTS-2) and Severity of Violence Against Women Scale.[13-18] Domestic violence was defined as violence committed by husband and family members during pregnancy and a woman was considered violated when she had given at least 1 positive answer to the related questions.

The violence questionnaire had 13, 9, and 15 questions for physical, sexual, and emotional violence, respectively in a 7-point Likert scale (Never, 1 time, 2 times, 3-5 times, 6-10 times, 11-20 times and more than 20). The questionnaire was validated by content validity method. Edinburg's depression questionnaire has been developed and extensively used worldwide for screening postpartum depression. It includes 10 questions in a 4-point Likert scale regarding common symptoms of depression. Mothers choose those they have experienced more in the week before. Each question is scored from 0 to 3 and the total score ranges from 0 to 30.[19] Those with scores more than 10 at postpartum period are considered depressed. Regarding the cut-off score, the questionnaire has 84%-100% sensitivity and 82%-84% specificity.[20] Pindl *et al*. noted 88-91% sensitivity and 76% specificity.[21] The questionnaire has been validated in this and other studies in Iran by content validity method.[22] Cronbach's alpha was calculated 0.85 for the domains of the violence questionnaire and Spearman's coefficient of correlation was used for reliability of this questionnaire in repeated sampling (0.90) and of Edinburg 's questionnaire (0.95).

A written informed consent was taken from each subject to take part in the study. After taking obstetrical history and determining the exact age of pregnancy by considering the first day of the last menstruation, the violation questionnaire was first completed by the participants in a private place and they were then divided in 2 groups: violated and non-violated. They were followed up until the end of pregnancy, and 4-6 weeks after delivery when Edinburg's questionnaire was given to the groups. The

data were analyzed with SPSS software (version 12, Chicago, IL, USA) using t and Chi-Square tests and the relative risk. The patients who obtained the scores of Edinburg's questionnaire 10 or more were referred to a psychologist.

Results

From 251 women assessed in the first stage of sampling, 11 were excluded during the follow-up period. Statistical analysis was ultimately performed for 240 women in 2 equal groups. The findings showed the following demographic characteristics in the non-violated and violated groups, respectively with no significant difference: mean age=25.77±4.88 and 26.28±6.13 years; mean age of husband=30.57±5.75 and 31.26±6.93 years; mean duration of marriage=6.13±4.58 and 6.65±5.12 years; mean income=299.42±93.74 and 283.13±98.57 Toomans; and desired pregnancy=82.5% and 84.2% (Table 1).

The scores of Edinburg's questionnaire ranged from 0 to 27 (8.25±6.82) and 34.2% of participants (82 women) obtained score 10 or more. Violated women had significantly higher scores (10.78±6.97) than non-violated subjects (5.37±5.66) (p<0.001). The prevalence rates of postpartum depression was 52.5% and 15.8% in violated and non-violated women, respectively with a significant difference (p=0.001). The relative risk was used to identify the relationship between domestic violence and postpartum depression; it showed that violence increases the risk of depression 3.3 times (CI=95%, 2.1-5.1).

The severity of depression was measured in terms of severity types (Figure 1), i.e. the more the women experienced different types of violence, the more they had postpartum depression. This denoted that those who had suffered from the 3 types of violence experienced more severe depression after delivery with a significant difference between the types (p=0.001).

Discussion

The results showed a significant relationship between violence and postpartum depression. 52.5% of violated women had depression while 15.8% of non-violated subjects were depressed, which denotes that

Table 1: Demographic characteristics of women in non-violated (N=120) and violated (N=120) groups in Marivan, 2007

Characteristics	Groups	Non-violated N=120	Violated N=120	Test Result
Age of woman(Year)	17-25	64 (43.3)	61 (51.1)	NS*
	>25	56 (56.7)	59 (49.9)	
Age of spouse (Year)	17-25	19 (15.8)	26 (21.7)	NS*
	>25	91 (84.2)	94 (78.3)	
Gravidity	1-3	114 (95)	106 (88.3)	NS*
	>3	6 (5)	14 (11.7)	
Education (woman)	Under High school Diploma	71 (59.2)	89 (74.2)	NS**
	High school Diploma & over	49 (40.8)	31 (25.8)	
Education (spouse)	Under High school Diploma	50 (41.7)	70 (58.3)	NS**
	High school Diploma & over	70 (58.3)	50 (41.7)	
Occupation	Housewife	97 (80.8)	110 (91.7)	NS**
	Employed	23 (19.2)	10 (8.3)	
Occupation (spouse)	Worker, farmer, employee	56 (46.7)	50 (41.6)	NS**
	Other	64 (53.3)	70 (58.3)	

- t-test, **Chi- square test

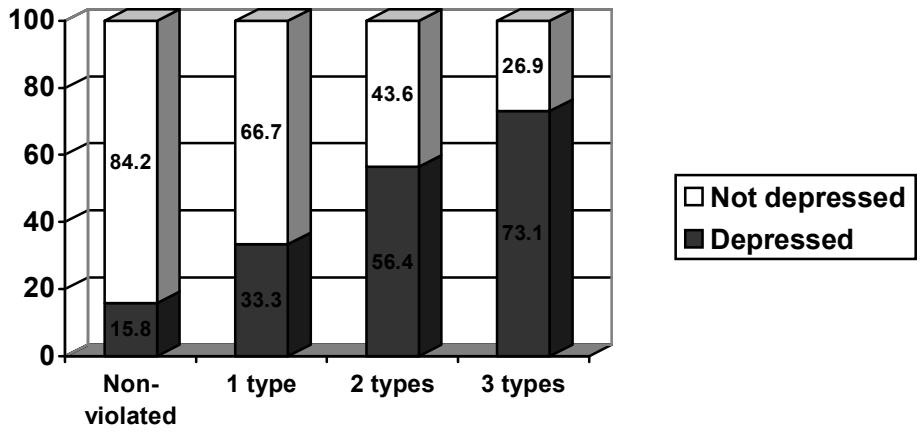

Fig. 1: Distribution of postpartum depression according to number of violence types in non-violated (N=120) and violated (N=120) groups in Marivan, 2007.

the risk of depression in violated women is 3.3 times greater than non-violated women. Leung *et al.* (2002) also found significantly higher scores of depression in violated women than non-violated ones 2-3 days postnatally, 2 days after discharge and 6 weeks after delivery.[8] Hegarty and coworkers (2004) found similar findings regarding the relationship between physical, emotional as well as sexual violence and postpartum depression.[23] Bonomi *et al.* (2006) contended that violated women experience mild and severe symptoms of depression more than non-violated ones[24] and Varma and coworkers (2006) found significantly lower quality of life and more posttraumatic stress disorders (PTSD), physical symptoms as well as depression in violated women.[12] Mezy *et al.* (2005) in their study on 200 English violated and non-violated women found a significant difference between the mean scores of Edinburg 's questionnaire after delivery, suggesting that the violated women be more susceptible to such mental disorders as anxiety and depression.[25] Bacchus and colleagues (2004) found a significant relationship between higher scores of postpartum depression and the past experience of domestic violence.[3]

What can be concluded from this and other studies in different countries with various cultures is the definite relationship between violence experience and the increased risk of postpartum depression. Although the sampling methods applied in this study were intended to control such intervening variables as the age of women and their husbands, educational level and occupation of the couples, economic status, gravidity and parity affecting postpartum depression according to other investigations,[26-30] the relationship was still significant. Therefore, it seems that some of these variables are effective. In recent years, extensive studies have been conducted regarding the etiology of postpartum psychological disorders. Although many factors may be associated with postpartum depression, some studies have focused on stress-related neuroendocrine dysfunctions.[20] Evidence shows that violated women experience a higher level of stress. In stressed people, the neuroendocrine channel comprising hypothalamic pituitary adrenal (HPA) axis responds to stress by hormonal secretion. The level a person experiences stress is directly related to the intensity of neuroendocrine response, i.e. stress produces stimulating hormones. Violence is a type of stress; therefore, when people experience physical, emotional and sexual violence, the axis is activated.[2] In addition, the specifications of postpartum period may increase the risk of anxiety-to-depression shift under the influences of different psychobiological stressors of pregnancy. Thus, violence and its associated stresses affect the immune system and continuation of the stressors leads to physical and psychological problems with different manifestations.[31,32]

Ehlert *et al*. found a significant increase in cortisol level of women experiencing more severe postpartum depression compared with other days of better feelings or with non-depressed women.[33] Similarly, Pederson and coworkers reported a significant relationship between increased plasma cortisol levels after delivery and the history of severe depression.[34]

Nierop *et al.* (2006) conducted a study to find the relationship between stress-related cortisol changes in pregnancy and depressive symptoms after delivery and found that depressed women showed significantly higher anxiety and lower mood states. Women with higher scores of Edinburg 's questionnaire had more intense hormonal response to stress in pregnancy, i.e. depressed women had more active cortisol response to stress test.[20] These findings describe how violence-induced stress can influence the body. Some studies have focused on the cultural as well as behavioral aspects of violence. Varma *et al.* (2006) contended that higher scores of depression in violated women may result from the effects of violence on self-concept particularly on self-confidence, dignity and competence. They found coexistence between depression and somatic symptoms, denoting that the symptoms reflect depressed affect in a more socially acceptable way. In addition, the expression of depression through somatic symptoms may be a reaction to domestic violence and an indirect request for help. Furthermore, it is widely believed that domestic violence is a private matter and should be kept secret. This hinders women to seek for help overtly and so leading to continuation of their problems and related manifestations.[12]

Bacchus and coworkers also found a relationship between mental status and physical heath in pregnancy since depression and anxiety symptoms might be associated with inadequate care, leading to adverse physical health outcomes. In addition, unwanted or unplanned pregnancies are more in violated women and they care themselves less. Thus, physical as well as psychological symptoms, anxiety, inadequate care and lack of social support due to domestic violence may affect woman's conception and attitude, and her tolerance and her concern to health and well-being. Accordingly, the likelihood of risky behaviors such as smoking, drinking, malnutrition and insufficient prenatal care increases and these may cause such severe complications that lead to hospitalization. This as a vicious cycle worsens physical and mental conditions of the woman.[3]

In the present study, different types of violence were assessed in the affected women and the results showed sexual violence as the most common type followed by emotional and physical as the next. In addition, experiencing 2 types, 1 type and three types of violence were observed respectively in terms of frequency. Emotional violence has come prior to physical violence in most studies; therefore, women experiencing physical violence have surely faced many psychological pressures due to insults and fear of harsher torments. Consequently, one of the outcomes of physical violence is mental disorders and suicide.[1] Hegarty *et al.* also found more severe depression in violated women than in non-violated ones.[23]

Previous studies have revealed that, for many women, frequent emotional violence may be more harmful than occasional physical violence. In addition, evidence shows that emotional violence can often predispose people to physical violence and the shift from emotional to physical violence can occur in less than 12 months. Thus intervention in proper time is essential to not only decrease harm to mothers but also prevent children from being in a brutish relationship.[35] Mezey and coworkers (2005) reported that, after a traumatic event, the risk of other traumatic incidents increases. Accordingly, domestic violence may trigger other traumatic and unwanted events with resultant psychological and social problems. They found that women with the history of domestic violence had experienced at least another traumatic event in their lives. They also reported significantly more medical visits for such psychological disorders as anger, anxiety, sleep disorders or sadness in violated women.[25]

The present study supported this hypothesis that domestic violence during pregnancy has negative effects on mental health of women after delivery. Due to the high risks of pregnancy and different physical and emotional outcomes of violence, screening of and consultation with at-risk families are of particular importance in this period.

Violence against women is difficult to measure for various reasons, including the fact that a standardized definition is lacking and the fact that some women are unwilling to disclose violence, because of social stigma or cultural sanctioning of violence. Therefore limitation of our work is that Patients do not speak spontaneously of violence, but the use of a specific questionnaire is thus useful to detect situations that would remain unknown and under-diagnosed.

It can be concluded that one of the complications of violence in pregnancy is an increased risk of postpartum depression. Understanding the importance of domestic violence and its complications needs consideration and is beneficial since, in spite of adverse outcomes of violence against women, it has not yet been identified as a problem in some countries including Iran. As a result, most healthcare workers do not have any information about the prevalence of violence and its complications in their population. It is

evident that without knowing signs and symptoms of domestic violence and its adverse effects on pregnancy and maternal mental status, healthcare workers cannot play their primary role.

In a broader range and with regard to the results, enacting a comprehensive law against domestic violence, improving economic condition of women in society, trying to increase public awareness about the violence, providing necessary instructions for adolescents and youths at high schools and colleges, establishing support centers for women and developing legal, medical as well as psychological services for violated women can reduce domestic violence and its outcomes.

Acknowledgements

We kindly express our gratitude to Research Deputy of Shaheed Beheshti Medical University for providing the budget of this study and to all participant women.

Conflict of interest: None declared.

References

1 García-Moreno C. WHO Multi-country study on women's health and domestic violence against women.(2005). Available from: http://www.WHO.org.

2 Records KA. Critical Review of Maternal Abuse and Infant Outcomes: Implication for Newborn Nurses. *Newborn Infant Nurs Rev* 2007;**7**:7-13.

3 Bacchus L, Mezey G, Bewley S. Domestic violence: prevalence in pregnant women and associations with physical and psychological health. *Eur J Obstet Gynecol Reprod Biol* 2004;**113**:6-11. [15036702] [doi:10.1016/S0301-2115(03)00326-9]

4 Lazenbatt A, Thompson-Cree ME, McMurray F. The use of exploratory factor analysis in evaluating midwives' attitudes and stereotypical myths related to the identification and management of domestic violence in practice. *Midwifery* 2005;**21**:322-34. [16076514] [doi:10.1016/j.midw.2005.02.006]

5 Edin KE, Högberg U. Violence against pregnant women will remain hidden as long as no direct questions are asked. *Midwifery* 2002;**18**:268-78. [12473442] [doi:10.1054/midw.2002.0318]

6 Faramarzi M, Esmaelzadeh S, Mosavi. Prevalence, maternal complication and birth outcome of physical, sexual and emotional domestic violence during pregnancy. *Acta Medica Iranica* 2005;**43**:115-122.

7 Raynor M. Pregnancy and the puerperium: the social and psychological context. *Psychiatry* 2006;5:1-4. [doi:10.1383/psyt.2006.5.1.1]

8 Leung WC, Kung F, Lam J, Leung TW, Ho PC. Domestic violence and postnatal depression in a Chinese community. *Int J Gynaecol Obstet* 2002;**79**:159-66. [12427403] [doi:10.1016/S0020-7292(02)00236-9]

9 Beck CT. Postpartum depression: it isn't just the blues. *Am J Nurs* 2006;**106**:40-50. [16639243]

10 Wisner KL, Hanusa BH, Perel JM, Peindl KS, Piontek CM, Sit DK, Findling RL, Moses-Kolko EL. Postpartum depression: a randomized trial of sertraline versus nortriptyline. *J Clin Psychopharmacol* 2006;**26**:353-60. [16855451] [doi:10.1097/01.jcp.0000227706.56870.dd]

11 Yost NP, Bloom SL, McIntire DD, Leveno KJ. A prospective observational study of domestic violence during pregnancy. *Obstet Gynecol* 2005;**106**:61-5. [15994618]

12 Varma D, Chandra PS, Thomas T, Carey MP. Intimate partner violence and sexual coercion among pregnant women in India: relationship with depression and post-traumatic stress disorder. *J Affect Disord* 2007;**102**:227-35. [17109969] [doi:10.1016/j.jad.2006.09.026]

13 Leung WC, Leung TW, Lam YY, Ho PC. The prevalence of domestic violence against pregnant women in a Chinese community. *Int J Gynaecol Obstet* 1999;**66**:23-30. [10458546] [doi:10.1016/S0020-7292(99)00053-3]

14 Shepard MF, Campbell JA. The Abusive Behavior Inventory: A measure of psychological and physical abuse. *J Inter Violence* 1992;**7**:291-305. [doi:10.1177/088626092007003001]

15 Hegarty K, Fracgp, Bush R, Sheehan M. The composite abuse scale: further development and assessment of reliability and validity of a multidimensional partner abuse measure in clinical settings. *Violence Vict* 2005;**20**:529-47. [16248489] [doi:10.1891/vivi.2005.20.5.529]

16 Rodenburg FA, Fantuzzo JW. The Measure of Wife Abuse: steps toward the development of a comprehensive assessment technique. *Family Violence J* 1993;**8**:203-228. [doi:10.1007/BF00988769]

17 Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The Revised Conflict Tactics Scale (CTS2): development and preliminary psychometric data. *J Family Issues* 1996;**17**:283-316. [doi:10.1177/019251396017003001]

18 Marshall LL. The Severity of Violence Against Men Scale. *Family Violence J* 1992;**7**:189-203. [doi:10 1007/BF00979027]

19 Logsdon MC, Hutti MH. Readability: an important issue impacting healthcare for women with postpartum depression. *MCN Am J Matern Child Nurs* 2006;**31**:350-5. [17149109]

20 Nierop A, Bratsikas A, Zimmermann R, Ehlert U. Are stress-induced cortisol changes during pregnancy associated with postpartum depressive symptoms? *Psychosom Med* 2006;**68**:931-7. [17132840] [doi:10.1097/01.psy.0000244385.93141.3b]

21 Peindl KS, Wisner KL, Hanusa BH. Identifying depression in the first postpartum year: guidelines for office-based screening and referral. *J Affect Disord* 2004;**80**:37-44. [15094256] [doi:10.1016/S0165-0327(03)00052-1]

22 Dolatian M, Pouneh M, Alavi Majd H, Yazdjerdi M. The relationship between mode of delivery and postpartum depression. *Reprodudtion & Infertility Med J* 2007;**3**:260-275.

23 Hegarty K, Gunn J, Chondros P, Small R. Association between depression and abuse by partners of women attending general practice: descriptive, cross sectional survey. *BMJ* 2004;**328**:621-4. [15016694] [doi:10.1136/bmj.328.7440.621]

24 Bonomi AE, Thompson RS, Anderson M, Reid RJ, Carrell D, Dimer JA, Rivara FP. Intimate partner

violence and women's physical, mental, and social functioning. *Am J Prev Med* 2006;**30**:458-66. [16704938] [doi:10.1016/j.amepre.2006.01.015]

25 Mezey G, Bacchus L, Bewley S, White S. Domestic violence, lifetime trauma and psychological health of childbearing women. *BJOG* 2005;**112**:197-204. [15663584] [doi:10.1111/j.1471-0528.2004.00307.x]

26 Rubertsson C, Wickberg B, Gustavsson P, Rådestad I. Depressive symptoms in early pregnancy, two months and one year postpartum-prevalence and psychosocial risk factors in a national Swedish sample. *Arch Womens Ment Health* 2005;**8**:97-104. [15883652] [doi:10.1007/s00737-005-0078-8]

27 Teng HW, Hsu CS, Shih SM, Lu ML, Pan JJ, Shen WW. Screening postpartum depression with the Taiwanese version of the Edinburgh Postnatal Depression scale. *Compr Psychiatry* 2005;**46**:261-5. [16175756] [doi:10.1016/j.comppsych.2004.10.003]

28 Bloch M, Rotenberg N, Koren D, Klein E. Risk factors for early postpartum depressive symptoms. *Gen Hosp Psychiatry* 2006;**28**:3-8. [16377359] [doi:10.1016/j.genhosppsych.2005.08.006]

29 Lau Y. Does pregnancy provide immunity from intimate partner abuse among Hong Kong Chinese women? *Soc Sci Med* 2005;**61**:365-77. [15893052] [doi:10.1016/j.socscimed.2004.12.002]

30 Howell EA, Mora P, Leventhal H. Correlates of early postpartum depressive symptoms. *Matern Child Health* J 2006;**10**:149-57. [16341910] [doi:10.1007/s10995-005-0048-9]

31 Eby KK. Exploring the stressors of low-income women with abusive partners: understanding their needs and developing effective community resources. *Family Violence J* 2004;**19**:221-32. [doi:10.1023/B:JOFV.0000032632.59865.8e]

32 Sutter-Dallay AL, Giaconne-Marcesche V, Glatigny-Dallay E, Verdoux H. Women with anxiety disorders during pregnancy are at increased risk of intense postnatal depressive symptoms: a prospective survey of the MATQUID cohort. *Eur Psychiatry* 2004;**19**:459-63. [15589703] [doi:10.1016/j.eurpsy.2004.09.025]

33 Ehlert U, Patalla U, Kirschbaum C, Piedmont E, Hellhammer DH. Postpartum blues: salivary cortisol and psychological factors. *J Psychosom Res* 1990;**34**:319-25. [2342000] [doi:10.1016/0022-3999(90)90088-L]

34 Pedersen CA, Stern RA, Pate J, Senger MA, Bowes WA, Mason GA. Thyroid and adrenal measures during late pregnancy and the puerperium in women who have been major depressed or who become dysphoric postpartum. *J Affect Disord* 1993;**29**:201-11. [8300979] [doi:10.1016/0165-0327(93)90034-H]

35 Pico-Alfonso MA, Garcia-Linares MI, Celda-Navarro N, Herbert J, Martinez M. Changes in cortisol and dehydroepiandrosterone in women victims of physical and psychological intimate partner violence. *Biol Psychiatry* 2004;**56**:233-40. [15312810] [doi:10.1016/j.biopsych.2004.06.001]