Physical abuse during pregnancy: prevalence and risk factors

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Evidence

Études

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See related article page 1022

Abstract

Background: Violence during pregnancy is a health and social problem that poses particular risks to the woman and her fetus. To address the lack of Canadian information on this issue, the authors studied the prevalence and predictors of physical abuse in a sample of pregnant women in Saskatoon.

Methods: Of 728 women receiving prenatal services through the Saskatoon District public health system between Apr. 1, 1993, and Mar. 31, 1994, 605 gave informed consent to participate in the study and were interviewed in the second trimester. Of these, 543 were interviewed again late in the third trimester. During the initial interview, information was collected on the women's sociodemographic characteristics, the current pregnancy, health practices and psychosocial variables. The second interview focused on the women's experience of physical abuse during the pregnancy and during the preceding year, the demographic characteristics and the use of alcohol or illicit drugs by their male partner.

Results: In all, 31 (5.7%) of the women reported experiencing physical abuse during pregnancy; 46 (8.5%) reported experiencing it within the 12 months preceding the second interview. Of the 31 women 20 (63.3%) reported that the perpetrator was her husband, boyfriend or ex-husband. Although all ethnic groups of women suffered abuse, aboriginal women were at greater risk than nonaboriginal women (adjusted odds ratio 2.8, 95% confidence interval [CI] 1.0–7.8). Women whose partner had a drinking problem were 3.4 times (95% CI 1.2–9.9) more likely to have been abused than women whose partner did not have a drinking problem. Perceived stress and number of negative life events in the preceding year were also predictors of abuse. Abused women tended to report having fewer people with whom they could talk about personal issues or get together; however, they reported socializing with a larger number of people in the month before the second interview than did the women who were not abused.

Interpretation: Physical abuse affects a significant minority of pregnant women and is associated with stress, lack of perceived support and a partner with a drinking problem.

In recent years violence against women has received increasing attention in the popular media and the medical literature. Violence against women at any time in their lives represents a serious social, legal and medical problem.[1] Violence during pregnancy may be even more harmful, since it poses a significant additional threat to the fetus. Studies have shown that physical abuse during pregnancy increases the risk of miscarriage, abruptio placentae, preterm labour and delivery, fetal fractures and low birth weight.[2,3] Other adverse consequences for the woman may include rupture of the uterus, liver or spleen, antepartum hemorrhage and pelvic fractures.[4]

Although many recent studies have focused on abuse against women in general,[5–7] relatively little is known about the prevalence and correlates of abuse during pregnancy in Canada. A 1993 Ontario study found that 6.6% of women in a mostly urban sample reported physical abuse during pregnancy.[8] Estimates of abuse from other studies, most conducted outside Canada, have ranged from 3.9% to 19.0%,[8–13] the specific rate appearing to vary with the sample selected, the measures of violence used and the study methods applied.[14] Few studies have examined the psychosocial correlates of abuse during pregnancy,[8,10,11] and even fewer have included characteristics of the male partner in their analysis.[10,11]

In the present report we describe the prevalence of physical abuse during preg-

nancy in a sample of women in Saskatoon. We also identify sociodemographic, psychosocial and partner characteristics that were significant factors related to the abuse.

Methods

Study sample

Our subjects were participants in the Saskatoon Pregnancy and Health Study.[15] They were recruited from among women receiving prenatal services from the publicly funded, community-based health services delivered by the Saskatoon Health District. These prenatal services are of 2 types: education classes open to all pregnant women and an outreach program for women with high-risk pregnancies. In a given year, women participating in these programs constitute almost half of all pregnant women in the Saskatoon area.

Detailed information on recruitment and data collection methods has been reported elsewhere.[15] In brief, between Apr. 1, 1993, and Mar. 31, 1994, English-speaking pregnant women in their second trimester who were residing in the Saskatoon district and receiving prenatal services through the district health services were selected. Of the 728 eligible women 605 gave informed consent and underwent an initial interview. Women were interviewed again late in their third trimester. All interviews were conducted face-to-face by 1 of 4 experienced female interviewers at the woman's home or another mutually convenient place, without her partner present. For comparison, information on several key demographic characteristics was collected (with consent) from those who refused to participate in the initial interview.

For analysis, our sample comprised 543 women who participated in both interviews. Of the 62 women who did not undergo the second interview, 23 (37.1%) refused, 20 (32.3%) were no longer eligible (moved out of study area or had premature termination of pregnancy), and 19 (30.6%) could not be contacted. These 62 women were more likely than the other women to have not been married, to have completed only grade school and to be aboriginal, but they did not differ in parity.

We calculated that a sample of 544 women would be required to estimate the prevalence of abuse with high precision (95% confidence intervals [CIs] extending 3% above or below the point estimate). This calculation assumed that the prevalence of abuse during pregnancy was 15% or less.[16] We used normalized sample weights to generalize prevalence estimates from our sample to that of the target population of all pregnant women in the Saskatoon district.[17]

Measures

In the initial interview we collected information on the women's sociodemographic characteristics (age, education, income, marital status, ethnic background, number of people in household), current pregnancy (parity, prenatal care, injuries, hospital admissions), health practices (alcohol use, illicit drug use) and psychosocial variables (attitude toward pregnancy, perceived stress, negative life events in the 12 months preceding the interview, mastery [a measure of the extent to which people believe they have control of important things that affect their lives], self-esteem, social support and network, anxiety and depression).

Total household income was expressed in relation to the number of people in the household, creating an ordinal variable (income adequacy). For example, for a 4-person household, income adequacy was categorized as "lowest/lower-middle" if the total household income was $19 999 or less, "middle" if the total income was $20 000 to 39 999 and "upper-middle/highest" if the total income was $40 000 or higher.

We constructed a summary measure of the adequacy of prenatal care that classifies the use of care according to length of gestation.[18] Care was defined as inadequate if it was started in the third trimester or, if started earlier, was infrequent (i.e., one or fewer contacts per 8 gestational weeks). Care was defined as adequate if started in the first trimester and involved frequent contact; all other combinations of care were defined as intermediate.

Perceived stress,[19] negative life events,[20] desirability of pregnancy,[21] mastery,[22] self-esteem,[23] social support and network,[24] and anxiety and depression[25] were measured using standardized scales, a higher score for each measure indicating more of that attribute.

In the second interview, questions focused on the woman's experience of abuse, demographic characteristics and use of alcohol or illicit drugs by the child's father or current male partner.

The outcome variable in this analysis — women's experience of physical abuse — was assessed using the Abuse Assessment Screen (AAS).[26] When evaluated against lengthier instruments measuring interpersonal conflict (e.g., the Conflict Tactics Scale[27] or the Index of Spouse Abuse[28]) the AAS has been found to be sensitive and specific to abuse status during pregnancy.[26] Participants were asked whether they had been hit, slapped, kicked or otherwise physically abused since becoming pregnant. If so, they were asked to indicate the perpetrator from a list of 5 alternatives (husband or boyfriend, ex-husband, relative, stranger or other). They were also asked the same 2 questions with reference to the preceding year. All women were offered written information, if requested or indicated, on community resources for law enforcement, safe shelter and legal aid.

Statistical analysis

Comparisons between women who had experienced physical abuse and those who had not were done using the χ^2 test and one-way analysis of variance. Hierarchical multiple logistic regression was used to estimate adjusted odds ratios for factors independently related to abuse.[29] Variables were entered into the model in 3 blocks (sociodemographic and pregnancy-related variables, psychosocial and behavioural risk factors, and partner characteristics); variables that were significant, according to the Wald test, were retained within each block as well as in the overall model. Each variable in the final model was tested against a reduced model without the variable, using the likelihood ratio test statistic.[29] All variables that significantly contributed to the final model were retained. All analyses were done using SPSS software (release 4, SPSS Inc., Chicago, 1990).

Results

Sample characteristics

The mean age of the 543 women was 24.6 years (range 15–40 years); over half (289 [53.2%]) were 24 years of age or less. Nearly one-third (176 [32.4%]) had not completed high school, and almost half (219 [44.9%]) had a household income that placed them in the 2 lowest groups of income adequacy. As for ethnic/cultural background, 91 (16.8%) of the women identified themselves as being aboriginal (First Na-

tions or Métis), 362 (66.6%) as being English or French and 90 (16.6%) as having either a mixed background or immigrant status. Almost three-quarters (395 [72.7%]) were primiparas. Compared with the population of women giving birth in the Saskatoon district in 1993/94, the study sample was younger and more likely to have never married and to be primiparous ($p < 0.001$).

Prevalence of physical abuse

Physical abuse during pregnancy was reported by 31 (5.7%) of the respondents. Within the preceding year, 46 (8.5%) reported having experienced abuse. When we adjusted these proportions for disproportionate sampling, the corresponding population estimates were 4.5% and 6.2%, respectively. Among those who experienced abuse, 20 (63.3%) reported that their husband, boyfriend or ex-husband was the perpetrator; the rest chose to indicate the perpetrator as "other" or not at all.

Table 1 shows the characteristics of the women in the 2 groups and the unadjusted odds ratios and 95% CIs. The age distribution of the women who reported physical abuse during pregnancy showed a negative pattern: 14 (45.2%) were 15–19 years of age, whereas 4 (12.9%) were 30–40 years. Bivariate comparisons showed that women who were 15–19 years of age, multiparous, not married, had not completed high school and had low income adequacy were more likely than other women in the study to report physical abuse during pregnancy. Women who used illicit drugs 3 months before pregnancy, had injuries or accidents during pregnancy, lived with a partner who had a drinking problem and higher scores for perceived stress were also more likely to report physical abuse during pregnancy.

The independent risk factors for physical abuse during pregnancy and the crude and adjusted odds ratios are given in Table 2. Women of aboriginal background were 2.8 times (95% CI 1.0–7.8) more likely than nonaboriginal women to have suffered abuse. Women whose partner had a drinking problem were 3.4 times (95% CI

Table 1: Characteristics of women in Saskatoon reporting no abuse and those reporting physical abuse during pregnancy

Characteristic	Group; no. (and %) of respondents* Not abused *n* = 512	Physically abused *n* = 31	Crude odds ratio (and 95% CI)
Age, yr			
15–19	106 (20.7)	14 (45.2)	3.2 (0.4–25.3)
20–24	160 (31.3)	9 (29.0)	1.4 (0.2–11.1)
25–29	134 (26.2)	4 (12.9)	0.7 (0.1–6.7)
30–34	88 (17.2)	3 (9.7)	0.8 (0.1–8.2)
35–40	24 (4.7)	1 (3.2)	1.0
Parity			
Primiparous	379 (74.0)	16 (51.6)	1.0
Multiparous	133 (26.0)	15 (48.4)	2.7 (1.3–5.6)
Marital status			
Married/common-law	362 (70.7)	15 (48.4)	1.0
Not married	150 (29.3)	16 (51.6)	2.6 (1.2–5.3)
Education level			
High school not completed	155 (30.3)	21 (67.7)	4.8 (2.2–10.5)
High school completed	357 (69.7)	10 (32.3)	1.0
Income adequacy†	*n = 488*	*n = 26*	
Lowest/lower-middle	219 (44.9)	20 (76.9)	7.9 (1.8–34.1)
Middle	97 (19.9)	4 (15.4)	3.6 (0.6–19.7)
Upper-middle/highest	172 (35.2)	2 (7.7)	1.0
Ethnic background			
Nonaboriginal	436 (85.2)	16 (51.6)	1.0
Aboriginal	76 (14.8)	15 (48.4)	5.4 (2.6–11.3)
Prenatal care			
Adequate	448 (87.5)	22 (71.0)	1.0
Intermediate	56 (10.9)	8 (25.8)	2.9 (1.2–6.8)
Inadequate	8 (1.6)	1 (3.2)	2.6 (0.3–21.3)
Illicit drug use 3 mo before pregnancy			
Yes	76 (14.8)	18 (58.1)	7.9 (3.7–16.9)
No	436 (85.2)	13 (41.9)	1.0
Injuries or accidents during pregnancy			
Yes	88 (17.2)	15 (48.4)	4.5 (2.2–9.5)
No	424 (82.8)	16 (51.6)	1.0
Partner has drinking problem			
Yes	38 (7.4)	16 (51.6)	13.3 (6.1–29.0)
No	474 (92.6)	15 (48.4)	1.0
Psychosocial characteristics			
Negative life events, mean score (and SD)‡	3.2 (2.8)	7.7 (3.2)	1.5 (1.3–1.7)
Perceived stress, mean score (and SD)‡	13.7 (6.6)	21.2 (7.2)	1.2 (1.1–1.3)
Mean no. of people with whom woman can talk about personal and private issues (and SD)	3.4 (1.6)	3.1 (2.0)	0.8 (0.6–1.0)
Mean no. of people with whom woman can get together to have fun or to relax (and SD)	5.5 (3.3)	4.2 (5.0)	0.9 (0.8–1.0)
Mean no. of people with whom woman did get together to have fun or to relax in month preceding third-trimester interview (and SD)	4.9 (3.4)	3.6 (3.4)	1.0 (0.9–1.1)

Note: CI = confidence interval, SD = standard deviation.
*Unless stated otherwise. For continuous variables (e.g., negative life events and perceived stress), the mean and SD comparing women not abused with those abused are presented; the crude odds ratio represents the increased (or decreased) risk of abuse corresponding to one-point increase in the independent variable.
†Twenty-nine women did not report their income level.
‡Measured using standardized scales, a higher score indicating more of that attribute.

1.2–9.9) more likely than those whose partner did not have a drinking problem to have been abused.

Women who had higher scores for perceived stress and more negative life events in the last 12 months were at elevated risk of abuse. Three social support variables were also significant predictors of abuse. Women who suffered abuse tended to report having fewer people with whom they could talk about personal issues or get together to have fun or to relax. However, abused women also tended to indicate that in the previous month they had actually got together with a larger number of people to have fun and to relax than did those who had not been abused.

Although unadjusted odds ratios indicated an increased risk for abuse among the women who used illicit drugs during the 3 months before pregnancy and among those who had injuries or accidents during pregnancy, the associations were not significant in the adjusted model. Age, parity, marital status, education, income adequacy and adequacy of prenatal care did not emerge in the logistic regression analysis as significant independent predictors of abuse during pregnancy.

Interpretation

Physical abuse during pregnancy and in the months preceding conception is not rare. The estimated prevalence of physical abuse among pregnant women in Saskatoon was 4.5% during pregnancy and 6.2% within the year preceding the third trimester interview. These proportions fall within the range of prevalence previously reported (3.9% to 19.0%).[14] However, because the nonrespondents in our study were more likely than the respondents to be of aboriginal background, a characteristic associated with an increased risk of abuse, the proportions we reported may be slightly underestimated.

Table 2: Logistic regression analysis of characteristics associated with physical abuse during pregnancy, final model

Characteristic	Crude odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Aboriginal background	5.4 (2.6–11.3)	2.8 (1.0–7.8)
Illicit drug use 3 mo before pregnancy	7.9 (3.7–16.9)	2.1 (0.7–5.9)
Had injuries or accidents during pregnancy	4.5 (2.2–9.5)	2.6 (0.97–6.9)
Negative life events	1.5 (1.3–1.7)	1.3 (1.1–1.6)
Perceived stress*	1.7 (1.4–2.0)	1.6 (1.2–2.0)
No. of people with whom woman can talk about personal and private issues	0.8 (0.6–1.0)	0.7 (0.5–0.99)
No. of people with whom woman can get together to have fun or to relax	0.9 (0.8–1.0)	0.7 (0.6–0.9)
No. of people with whom woman did get together to have fun or to relax	1.0 (0.9–1.1)	1.5 (1.2–1.8)
Partner has drinking problem	13.3 (6.1–29.0)	3.4 (1.2–9.9)

*Odds ratio (and 95% CI) calculated for a change of 3 points in the perceived stress score (mean 15.0 [and SD 7.2]).

The accuracy of our estimates may also be affected by respondents' tendency to underreport sensitive experiences such as physical abuse. However, the method we used to collect data on abuse — a set of questions asked by an interviewer in a private setting — has been found to elicit higher response rates about physical abuse than self-administered questions.[26,30] An added advantage is that, because we collected data on abuse during a follow-up visit late in the third trimester, the respondents had already met the interviewer once before and may have felt safer revealing their abuse history to her.

The association between women's age and physical abuse is not consistent across studies. Some studies reported a higher prevalence of abuse among younger women,[8–10,31] whereas others found no association with age.[11,12] We found an inverse relation between age and physical abuse in our univariate analysis, but this association disappeared after we adjusted for other factors.

Women in our study whose male partner had a drinking problem were 3.4 times more likely than those whose partner did not have a drinking problem to have been physically abused during pregnancy. This risk factor has been identified in other studies as well,[32,33] but the temporal sequence underlying this association is less clear. Use of alcohol or drugs, by the perpetrator or the victim, or both, may be both a cause and an effect of physical abuse.[9,11,13] Studies have shown that, among male perpetrators of abuse against women, alcohol and drug use is often involved;[32,33] at the same time, women who are abused may use alcohol, illicit drugs or prescription drugs, perhaps in some cases to help them cope with the abuse.

The associations we found between physical abuse and perceived stress and negative life events reflect the generally unfavourable conditions in which abused women live. For many women, physical abuse is only one of many problems that endanger their health during pregnancy. The association between stress and physical abuse, where stress was measured both as a generalized global measure and in relation to specific negative events, indicates the profound psychological implications of abuse on women.

Our finding that women who were not abused during pregnancy tended to have a wider network of friends with whom they could talk or get together than those who were abused is consistent with other studies demonstrating a protective role of social support against physical abuse.[10,13] However, we found that not all social relationships provided such protection. Women who socialized with a larger number of friends in the month before the second interview were *more* likely to have been abused than those who socialized with fewer friends. Interpreting these complex findings regarding social support requires further investigation. Women who report socializing with larger numbers of people may have distinctively different patterns of (or

reasons for) interaction with others that are somehow connected to abuse, whereas the perception of fewer social resources reflects abused women's isolation.

To our knowledge, the higher risk of physical abuse during pregnancy we found among the aboriginal women than among the nonaboriginal women has not been reported before. Moreover, this higher risk was independent of the other risk factors (partner's drinking problem, higher perceived stress and lower social support). This finding must be interpreted with caution, however, because ethnic background is a complex variable that captures a wide array of social and cultural factors. We recorded the ethnic background of the abuse victim, not of the perpetrator. Knowing the perpetrator's ethnic background would probably shed more light on the association between this variable and abuse.

In conclusion, a significant minority of women are physically abused during pregnancy. Moreover, many of these women live in conditions that pose multiple risks to their health and that of their unborn children, experiencing high levels of perceived stress, having few people with whom to talk about personal issues and living with a partner who has a drinking problem.

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References

1. Council on Scientific Affairs, American Medical Association. Violence against women. Relevance for medical practitioners. *JAMA* 1992;267:3184-9.
2. Bullock LF, McFarlane J. The birth-weight, battering connection. *Am J Nurs* 1989;89:1153-5.
3. Pearlman MD, Tintinalli JE, Lorenz RP. Blunt trauma during pregnancy. *N Engl J Med* 1990;323:1609-13.
4. Sammons MN. Battered and pregnant. *Am J Matern Child Nurs* 1981;6:246-50.
5. Ferris LE, Tudiver F. Family physician's approach to wife abuse: a study of Ontario, Canada, practices. *Fam Med* 1992;24:276-82.
6. Brown JB, Sas G, Lent B. Identifying and treating wife abuse. *J Fam Pract* 1993;36:186-91.
7. Hotch D, Grunfeld AF, Mackay K, Cowan L. An emergency department-based domestic violence intervention program: findings after one year. *J Emerg Med* 1996;14:111-7.
8. Stewart DE, Cecutti A. Physical abuse in pregnancy. *CMAJ* 1993;149:1257-63.
9. Hillard PJ. Physical abuse in pregnancy. *Obstet Gynecol* 1985;66:185-90.
10. Gielen AC, O'Campo PJ, Faden RR, Kass NE, Xue X. Interpersonal conflict and physical violence during the childbearing year. *Soc Sci Med* 1994;39:781-7.
11. Amaro H, Fried LE, Cabral H, Zuckerman B. Violence during pregnancy and substance use. *Am J Public Health* 1990;80:575-9.
12. Helton AS, McFarlane J, Anderson ET. Battered and pregnant: a prevalence study. *Am J Public Health* 1987;77:1337-9.
13. Campbell JC, Poland ML, Walker JB, Ager J. Correlates of battering during pregnancy. *Res Nurs Health* 1992;15:219-26.
14. Gazmararian JA, Lazorick S, Spitz AM, Ballard TJ, Saltzman LE, Marks JS. Prevalence of violence against pregnant women. *JAMA* 1996;275:1915-20.
15. Muhajarine N, D'Arcy C, Edouard L. Prevalence and predictors of health risk behaviours during pregnancy: Saskatoon Pregnancy and Health Study. *Can J Public Health* 1997;88:375-9.
16. Lwanga SK, Lemeshow S. *Sample size determination in health studies. A practical manual*. Geneva: World Health Organization; 1991. p. 25.
17. Fleiss JL. The standardization of rates. In: *Statistical methods for rates and proportions*. New York: John Wiley & Sons; 1981. p. 237-55.
18. Kessner DM, Singer J, Kalk CE, Schlesinger ER. *Infant death: an analysis of maternal risk and health care*. Washington: Institute of Medicine, National Academy of Sciences; 1973. p. 58-61.
19. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav* 1983;24:385-96.
20. Newton R, Hunt L. Psychosocial stress in pregnancy and its relation to low birthweight. *BMJ* 1984;288:1191-4.
21. Berkowitz G, Kasl S. The role of psychosocial factors in spontaneous preterm delivery. *J Psychosom Res* 1983;27:283-90.
22. Pearlin LI, Schooler C. The structure of coping. *J Health Soc Behav* 1978; 19:2-21.
23. Rosenberg M. *Conceiving the self*. New York: Basic Books; 1979. p. 291-5.
24. Barrera M. Social support in the adjustment of pregnant adolescents: assessment issues. In: Gottlieb B, editor. *Social network and social support*. Beverley Hills (CA): Sage; 1981. p. 69-96.
25. Derogatis L, Meliseratos N. The Brief Symptom Inventory: an introductory report. *Psychol Med* 1983;13:595-605.
26. McFarlane J, Parker B, Soeken K, Bullock L. Assessing for abuse during pregnancy: severity and frequency of injuries and associated entry into prenatal care. *JAMA* 1992;267:3176-8.
27. Straus MA. Measuring intrafamily conflict and violence: the Conflict Tactics (CT) scales. *J Marriage Fam* 1979;41:75-88.
28. Hudson W, McIntosh S. The index of spouse abuse: two quantifiable dimensions. *J Marriage Fam* 1981;43:873-88.
29. Hosmer D, Lemeshow S. *Applied logistic regression*. New York: John Wiley & Sons; 1989. p. 25-58.
30. McFarlane J, Christoffel K, Bateman L, Miller V, Bullock L. Assessing for abuse: self-report versus nurse interview. *Public Health Nurs* 1991;8:245-50.
31. Bullock L, McFarlane J, Bateman L, Miller V. Characteristics of battered women in a primary care setting. *Nurse Pract* 1989;14:47-55.
32. Hotaling GT, Sugarman DB. An analysis of risk markers in husband to wife violence: the current state of knowledge. *Violence Vict* 1986;1:101-24.
33. Tolman RM, Bennett LW. A review of quantitative research on men who batter. *J Interpersonal Violence* 1990;5:87-118.

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