

Physical Abuse of Women Before, During, and After Pregnancy

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MANY WOMEN, INCLUDING pregnant women and those soon to become pregnant, have been physically abused by intimate partners or others.¹⁻¹² Studies of abuse during the year preceding pregnancy report prevalence estimates ranging from 4% to 26%,^{5,8-11} while investigations of abuse during pregnancy have generally found prevalences of 4% to 8%.⁹ Differences in these prevalence figures are probably due to variations in violence across populations, as well as use of differing study methods.

Although research on abuse before and during pregnancy is increasing, a dearth of information exists concerning abuse that occurs after infant delivery, a stressful time for many families.^{13,14} Only 3 clinically based investigations were identified that followed up patients after delivery to examine various types of postpartum abuse. Two of these studies found postpartum abuse prevalences of 19% to 24%, while the third study (which focused on women who were abused during pregnancy) found a postpartum abuse prevalence of 90%.^{10,15,16}

The American Academy of Pediatrics¹⁷ has recently joined other organizations, including the American Medical Association¹⁸ and the American College of Obstetricians and Gynecologists,¹⁹ in endorsing screening for violence among female patients. Thus, cli-

Context Clinicians who care for new mothers and infants need information concerning postpartum physical abuse of women as a foundation on which to develop appropriate clinical screening and intervention procedures. However, no previous population-based studies have been conducted of postpartum physical abuse.

Objectives To examine patterns of physical abuse before, during, and after pregnancy in a representative statewide sample of North Carolina women.

Design, Setting, and Participants Survey of participants in the North Carolina Pregnancy Risk Assessment Monitoring System (NC PRAMS). Of the 3542 women invited to participate in NC PRAMS between July 1, 1997, and December 31, 1998, 75% (n=2648) responded.

Main Outcome Measures Prevalence of physical abuse during the 12 months before pregnancy, during pregnancy, and after infant delivery; injuries and medical interventions resulting from postpartum abuse; and patterns of abuse over time in relation to sociodemographic characteristics and use of well-baby care.

Results The prevalence of abuse before pregnancy was 6.9% (95% confidence interval [CI], 5.6%-8.2%) compared with 6.1% (95% CI, 4.8%-7.4%) during pregnancy and 3.2% (95% CI, 2.3%-4.1%) during a mean postpartum period of 3.6 months. Abuse during a previous period was strongly predictive of later abuse. Most women who were abused after pregnancy (77%) were injured, but only 23% received medical treatment for their injuries. Virtually all abused and nonabused women used well-baby care; private physicians were the most common source of care. The mean number of well-baby care visits did not differ significantly by maternal patterns of abuse.

Conclusion Since well-baby care use is similar for abused and nonabused mothers, pediatric practices may be important settings for screening women for violence.

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nicians who care for new mothers and infants need additional empirical information concerning postpartum abuse to provide a foundation on which to develop and implement appropriate abuse screening, referral, and intervention procedures. This article examines (1) the prevalence and patterns of physical abuse before, during, and after pregnancy; (2) injuries and medical interventions resulting from postpartum abuse; and (3) patterns of abuse over time in relation to women's sociodemographic characteristics and use of well-baby care.

METHODS

Data are from the North Carolina Center for Health Statistics/Centers for Disease Control and Prevention North Caro-

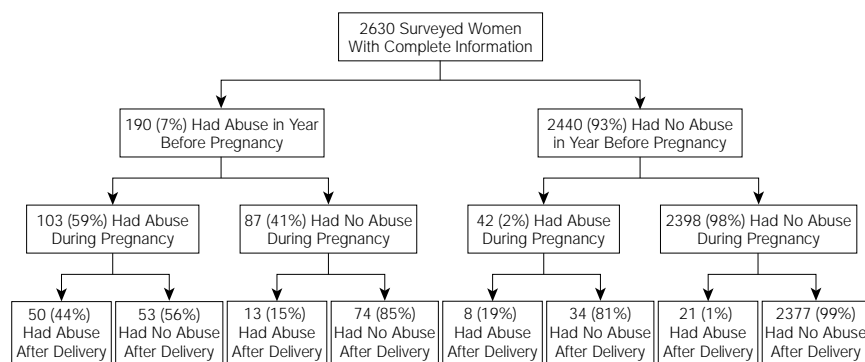
lina Pregnancy Risk Assessment Monitoring System (NC PRAMS). This ongoing project (described elsewhere)²⁰ is a population-based mailed and telephone survey of a representative group of North Carolina women who recently delivered live-born infants. The North Carolina birth certificate file serves as the sampling frame source for NC

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For editorial comment see p 1628.

Figure. Patterns of Physical Abuse Before, During, and After Pregnancy in North Carolina Women, 1997-1998



Of the 2648 survey respondents, 2630 (99%) had information available on abuse. The percentages presented have been adjusted for the sampling procedures to provide statewide estimates; however, the numbers presented have not been adjusted accordingly (they are the actual numbers of survey respondents).

PRAMS, with oversampling of women with low-birth-weight infants. Seventy-five percent of the 3542 women invited to participate in NC PRAMS between July 1, 1997, and December 31, 1998, responded to the survey (n=2648); the mean postpartum period (ie, the time between infant delivery and survey completion) was 3.6 months. Comparison of birth certificate information for respondents vs nonrespondents showed that nonrespondents were significantly more likely to be young, unmarried, and black and have less than a high school education.

The survey assessed physical abuse by asking women if they had been pushed, hit, slapped, kicked, or physically hurt in some other way during each of 3 periods: the 12 months before becoming pregnant, during pregnancy, and after infant delivery. Women abused during each period were asked about their social relationship with the perpetrator of the abuse (eg, husband/partner), and women who experienced postpartum abuse were asked a series of questions about particular types of violence-related injuries (eg, pain experienced the day after the abuse, weapon wounds) and medical care for these injuries. The survey also documented women's sociodemographic characteristics and well-baby care use (defined as taking the infant to a physician or nurse for routine care, excluding visits due to illness).

Abuse prevalences before, during, and after pregnancy were computed. Odds ratios (ORs) and 95% confidence intervals (CIs) quantified associations between abuse that occurred during a previous period and that which occurred at a subsequent time. Descriptive and bivariate analyses examined relationships between patterns of abuse and women's sociodemographic characteristics, as well as use of well-baby care. SUDAAN software²¹ was used to take the survey sampling methods into account.

RESULTS

The statewide abuse prevalence during the 12 months before pregnancy was 6.9% (95% CI, 5.6%-8.2%); 68% of perpetrators were current or former husbands/partners, 14% were family members, 8% were multiple persons, 5% were friends, and 5% were someone else. Similarly, abuse prevalence during pregnancy was 6.1% (95% CI, 4.8%-7.4%); 67% of perpetrators were current or former husbands/partners, 14% were family members, 4% were multiple persons, 3% were friends, and 12% were someone else. Postpartum abuse prevalence was 3.2% (95% CI, 2.3%-4.1%); 76% of perpetrators were current or former husbands/partners, 10% were multiple persons, 9% were family members, 5% were friends, and less than 1% were someone else. Sev-

enty-seven percent of women who were abused after delivery were injured, experiencing pain the day after the abuse (73%), sprains/bruises/small cuts (57%), head/internal/permanent injuries (9%), weapon wounds (8%), and broken bones/severe cuts/burns (6%). Although three quarters of these women had multiple types of injuries, only 23% received medical care for them.

Abuse during a previous period was a strong risk factor for subsequent abuse (FIGURE). A strong, significant association was found between abuse before and during pregnancy (OR, 67.6; 95% CI, 27.3-167.2). There also was a strong, significant association between abuse during pregnancy and postpartum abuse among women who were abused before pregnancy (OR, 38.0; 95% CI, 5.8-247.3). Among women who were not abused before pregnancy, the positive association between abuse during pregnancy and postpartum abuse also was strong; however, this association did not reach statistical significance (OR, 4.4; 95% CI, 0.9-22.0). Less than 1% of all women experienced abuse for the first time after infant delivery (ie, they were abused after delivery but not before or during pregnancy). Furthermore, only 29% of women who were abused after delivery had not been abused during the year before pregnancy, so absence of abuse before pregnancy was strongly protective against postpartum abuse (OR, 0.02; 95% CI, 0.01-0.06). Similarly, only 18% of women who were abused after delivery had not been abused before or during pregnancy, so absence of any previous abuse was strongly protective against postpartum abuse (OR, 0.01; 95% CI, 0.001-0.05).

Respondents' sociodemographic characteristics did not vary significantly among the 8 patterns of abuse (TABLE 1). However, comparison of women with a history of abuse during any period with never-abused women found that abused women were significantly more likely to be unmarried ($\chi^2_1=43.5; P=.01$), poor ($\chi^2_1=21.7; P=.02$), and younger ($\chi^2_1=21.6; P=.02$), with less than a high school education ($\chi^2_1=20.2; P=.02$).

Virtually all respondents took their infants to health care practitioners for well-baby care (TABLE 2). Both abused and nonabused women used a variety of well-baby care sources, with private physicians being the predominant care source in 7 of the 8 abuse pattern groups. There was no statistically significant association between abuse patterns and primary source of well-baby care, nor did the mean number of well-baby care visits differ significantly between infants of never-abused women and any of the other 7 pattern groups of abused women.

COMMENT

This is the first statewide study, to our knowledge, to examine women's postpartum physical abuse experiences in addition to abuse before and during pregnancy. Abuse prevalence was relatively low (3.2%) during the mean 3.6-month postpartum period studied compared with prevalence of abuse during the 12 months before pregnancy (6.9%) and the approximate 9 months of pregnancy (6.1%). It is noteworthy that the highest prevalence estimate resulted from ex-

amination of the longest period, whereas the lowest prevalence estimate resulted from examination of the shortest period. It is important to note that even this relatively low prevalence translates into the abuse of more than 3000 new mothers annually in North Carolina. Previous abuse was a strong risk factor for subsequent abuse (including postpartum), a finding consistent with other research documenting the often long-term nature of violence.² Although women abused after pregnancy often were injured (with few receiving medical care for their injuries), these women managed to bring their infants to well-baby care visits as frequently as nonabused women, and this care was provided most often by private physicians.

These findings should be interpreted in light of the study's methodological constraints. For example, 25% of women invited to participate in NC PRAMS did not complete the survey, with nonrespondents more likely than respondents to be young, unmarried, black, and of low education levels. Furthermore, survey responses concerning sensitive topics such as abuse are prone to re-

sponse bias, which may lead to underestimation of the true extent of abuse. Moreover, women's ability to recall abusive events may vary as a function of the period asked about, with less recall of events that occurred in the more distant past. In addition, the survey did not ask about the composition of women's households or whether they changed intimate partners during the 3 periods examined; thus, we are unsure of whether the initiation or discontinuation of violence as time progressed was associated with these types of alterations. Similarly, information was not available concerning types of abuse other than physical abuse (eg, psychological). Finally, since NC PRAMS includes only women whose pregnancies resulted in live births, these findings may not be generalizable to women with other types of pregnancy outcomes.

Despite these study limitations, these findings should alert health care practitioners that women who are physically abused before and/or during pregnancy often continue to experience abuse after infant delivery, placing the health of both mother and child in jeopardy. Fur-

Table 1. Sociodemographic Characteristics by Physical Abuse Before, During, and After Pregnancy in North Carolina Women, 1997-1998*

	All Women	Abuse in All 3 Periods	Abuse Before and During Pregnancy; No Abuse After	Abuse Before and After Pregnancy; No Abuse During	Abuse Before Pregnancy; No Abuse During or After	No Abuse Before Pregnancy; Abuse During and After	No Abuse Before or After Pregnancy; Abuse During	No Abuse Before or During Pregnancy; Abuse After	No Abuse in Any of the 3 Periods	P Value†
Previous children										
Yes	57 (1385)	58 (31)	65 (33)	43 (7)	62 (41)	81 (6)	48 (14)	66 (11)	56 (1242)	.72
No	43 (1245)	42 (19)	35 (20)	57 (6)	38 (33)	19 (2)	52 (20)	34 (10)	44 (1135)	
Race/ethnicity										
Black	25 (792)	41 (20)	26 (20)	37 (4)	37 (29)	41 (3)	58 (19)	33 (8)	24 (689)	.32
Other	75 (1838)	59 (30)	74 (33)	63 (9)	63 (45)	59 (5)	42 (15)	67 (13)	76 (1688)	
Education level										
Not a high school graduate	22 (545)	55 (23)	31 (17)	39 (4)	37 (29)	39 (2)	35 (13)	79 (10)	20 (447)	.19
High school graduate	78 (2085)	45 (27)	69 (36)	61 (9)	63 (45)	61 (6)	65 (21)	21 (11)	80 (1930)	
Age, y										
≤19	15 (403)	28 (11)	34 (15)	53 (4)	36 (18)	18 (1)	43 (14)	32 (7)	13 (333)	.19
≥20	85 (2227)	72 (39)	66 (38)	47 (9)	64 (56)	82 (7)	57 (20)	68 (14)	87 (2044)	
Poverty status										
Yes	12 (357)	44 (19)	45 (19)	18 (1)	26 (18)	2 (1)	11 (7)	56 (7)	10 (285)	.15
No	88 (2273)	56 (31)	56 (34)	82 (12)	74 (56)	98 (7)	89 (27)	44 (14)	90 (2092)	
Marital status										
Unmarried	33 (904)	57 (34)	61 (29)	75 (7)	66 (39)	62 (4)	78 (25)	36 (8)	30 (758)	.08
Married	67 (1726)	43 (16)	39 (24)	25 (6)	34 (35)	38 (4)	22 (9)	64 (13)	70 (1619)	

*All data except P values are % (No.). Of the 2648 survey respondents, 2630 (99%) had information available on abuse and sociodemographics. Percentages have been adjusted for the sampling procedures to provide statewide estimates; however, the numbers have not been adjusted accordingly (they are the actual numbers of respondents). †P values were calculated using χ^2 analyses.

Table 2. Infants' Primary Source of Well-Baby Care and Number of Well-Baby Care Visits by Maternal Physical Abuse Before, During, and After Pregnancy in North Carolina Women, 1997-1998*

	All Women	Abuse in All 3 Periods	Abuse Before and During Pregnancy; No Abuse After	Abuse Before and After Pregnancy; No Abuse During	Abuse Before Pregnancy; No Abuse During or After	No Abuse Before Pregnancy; Abuse During and After	No Abuse Before or After Pregnancy; Abuse During	No Abuse Before or During Pregnancy; Abuse After	No Abuse in Any of the 3 Periods
Used well-baby care									
Yes	99 (2352)	100 (40)	100 (48)	100 (12)	99 (66)	100 (8)	100 (31)	82 (17)	99 (2130)
No	1 (32)	0 (2)	0 (0)	0 (0)	1 (2)	0 (0)	0 (2)	18 (1)	1 (25)
Primary source of well-baby care†									
Private physician office	71 (1670)	47 (22)	69 (30)	70 (7)	62 (38)	43 (4)	47 (18)	18 (9)	73 (1542)
Health department	7 (140)	13 (3)	2 (5)	2 (1)	15 (7)	21 (1)	20 (3)	19 (2)	7 (118)
Community health center	4 (86)	18 (4)	11 (3)	22 (1)	5 (5)	0 (0)	12 (3)	2 (1)	3 (69)
Hospital	9 (214)	11 (5)	15 (6)	4 (2)	10 (8)	0 (0)	10 (2)	38 (3)	9 (188)
Other or multiple sources	9 (226)	11 (4)	3 (3)	2 (1)	8 (8)	36 (3)	11 (5)	23 (2)	8 (200)
Mean No. of well-baby care visits‡	3.0	3.3	3.1	4.7	2.9	2.3	3.2	3.1	2.9

*All data except mean No. of well-baby care visits are % (No.). Of the 2648 survey respondents, 2384 (90%) had information available on abuse and ever use of well-baby care; among the 2352 reporting well-baby care use, 2336 (99%) had information available on primary source of and No. of well-baby care visits. Percentages have been adjusted for the sampling procedures to provide statewide estimates; however, the numbers have not been adjusted accordingly (they are the actual numbers of respondents).

†Analyses were restricted to those who used well-baby care. There was no statistically significant association between women's abuse experiences and primary source of well-baby care ($\chi^2 = 35.11$; $P = .49$), and no statistically significant differences were found when the mean number of well-baby care visits was compared between never-abused women and women in each of the other 7 groups.

thermore, these abused mothers do take their infants to well-baby care visits. Thus, repeated clinical screening of women for violence within various health care settings, including pediatric practices, appears warranted. Given the current relatively low rate of violence screening by pediatric practitioners,²²⁻²⁵ enhanced education and training of pediatricians concerning the often long-term nature of violence as well as appropriate abuse screening protocols and referral/intervention procedures are needed. These are important steps toward ensuring that women who experience physical abuse are provided with optimal care for this important health concern.

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Acquisition of data: Buescher.
Analysis and interpretation of data: Martin, Mackie, Kupper, Buescher, Moracco.
Drafting of the manuscript: Martin, Kupper, Buescher, Moracco.
Critical revision of the manuscript for important intellectual content: Martin, Mackie, Kupper, Buescher, Moracco.
Statistical expertise: Martin, Mackie, Kupper.
Obtaining funding: Buescher.
Study supervision: Martin.
Literature review: Moracco.
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REFERENCES

1. Tjaden P, Thoennes N. *Prevalence, Incidence and Consequences of Violence Against Women*. Washington, DC: National Institute of Justice; 1998. Publication NCJ 172837.
2. Tjaden P, Thoennes N. *Extent, Nature, and Consequences of Intimate Partner Violence*. Washington, DC: National Institute of Justice; 2000. Publication NCJ 181867.
3. Bureau of Justice Statistics. *Criminal Victimization in United States, 1998 Statistical Tables*. Available at: <http://www.ojp.usdoj.gov/bjs/pub/pdf/cvus98.pdf>. Accessed January 31, 2001.
4. Rennison CM, Welchans S. *Intimate Partner Violence*. Washington, DC: US Dept of Justice; 2000. Publication NCJ 178247.
5. Helton AS, McFarlane J, Anderson ET. Battered and pregnant: a prevalence study. *Am J Public Health*. 1987;77:1337-1339.
6. Martin SL, English KT, Clark KA, et al. Violence and substance use among North Carolina pregnant women. *Am J Public Health*. 1996;86:991-998.
7. McFarlane J, Parker B, Soeken K, Bullock L. Assessing for abuse during pregnancy. *JAMA*. 1992; 267:3176-3178.
8. Stewart DE, Cecutti A. Physical abuse in pregnancy. *CMAJ*. 1993;149:1257-1263.
9. Gazmararian JA, Lazorick S, Spitz AM, Ballard TJ, Saltzman LE, Marks JS. Prevalence of violence against pregnant women. *JAMA*. 1996;275:1915-1920.
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;39:781-787.
11. Gazmararian JA, Adams MM, Saltzman JE, et al, for the PRAMS Working Group. The relationship between pregnancy intendedness and physical vio-

12. Gelles RJ. Violence and pregnancy. *J Marriage Fam*. 1988;50:841-847.
13. Belsky J, Spanier G, Rovine M. Stability and change in marriage across the transition to parenthood. *J Marriage Fam*. 1983;8:567-577.
14. Miller BC, Sollie DL. Normal stresses during the transition to parenthood. *Fam Relationships*. 1980; 29:459-465.
15. Stewart DE. Incidence of postpartum abuse in women with a history of abuse during pregnancy. *CMAJ*. 1994;151:1601-1604.
16. Hedin LW. Postpartum, also a risk period for domestic violence. *Eur J Obstet Gynecol Reprod Biol*. 2000;89:41-45.
17. American Academy of Pediatrics Task Force on Violence. The role of the pediatrician in youth violence prevention in clinical practice and at the community level. *Pediatrics*. 1999;103:173-181.
18. American Medical Association Council on Scientific Affairs. Violence against women: relevance for medical practitioners. *JAMA*. 1992;267:3184-3189.
19. *The Battered Woman*. Washington, DC: American College of Obstetricians and Gynecologists; 1989. ACOG technical bulletin 124.
20. Clark KA, Martin SL, Petersen R, et al. Who gets screened during pregnancy for intimate partner violence? *Arch Fam Med*. 2001;9:1093-1099.
21. Shah BV, Barnwell BG, Bieler GS. *SUDAAN User's Manual: Release 7.0*. Research Triangle Park, NC: Research Triangle Institute; 1996.
22. American Academy of Pediatrics. The role of the pediatrician in recognizing and intervening on behalf of abused women. *Pediatrics*. 1998;101:1091-1092.
23. Wright RJ, Wright RO, Isaac NE. Response to battered mothers in the pediatric emergency department. *Pediatrics*. 1997;99:186-192.
24. Kerker BD, Horwitz SM, Leventhal JM, Plichta S, Leaf P. Identification of violence in the home. *Arch Pediatr Adolesc Med*. 2000;154:457-462.
25. Wright RJ. Identification of domestic violence in the community pediatric setting. *Arch Pediatr Adolesc Med*. 2000;154:431-433.