ORIGINAL INVESTIGATION

Intimate Partner Violence and Physical Health Consequences

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Background: Domestic violence results in long-term and immediate health problems. This study compared selected physical health problems of abused and never abused women with similar access to health care.

Methods: A case-control study of enrollees in a multisite metropolitan health maintenance organization sampled 2535 women enrollees aged 21 to 55 years who responded to an invitation to participate; 447 (18%) could not be contacted, 7 (0.3%) were ineligible, and 76 (3%) refused, yielding a sample of 2005. The Abuse Assessment Screen identified women physically and/or sexually abused between January 1, 1989, and December 31, 1997, resulting in 201 cases. The 240 controls were a random sample of never abused women. The general health perceptions subscale of the Medical Outcomes Study 36-Item Short-Form Health Survey measured general health. The Miller Abuse Physical Symptom and Injury Scale measured abuse-specific health problems.

Results: Cases and controls differed in ethnicity, marital status, educational level, and income. Direct weights were used to standardize for comparisons. Significance was tested using logistic and negative binomial regressions. Abused women had more ($P<.05$) headaches, back pain, sexually transmitted diseases, vaginal bleeding, vaginal infections, pelvic pain, painful intercourse, urinary tract infections, appetite loss, abdominal pain, and digestive problems. Abused women also had more ($P\leq.001$) gynecological, chronic stress–related, central nervous system, and total health problems.

Conclusions: Abused women have a 50% to 70% increase in gynecological, central nervous system, and stress-related problems, with women sexually and physically abused most likely to report problems. Routine universal screening and sensitive in-depth assessment of women presenting with frequent gynecological, chronic stress–related, or central nervous system complaints are needed to support disclosure of domestic violence.

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THERE IS mounting evidence that domestic violence (DV) has long-term negative health consequences for survivors, even after the abuse has ended. This can translate into lower health status, lower quality of life, and higher utilization of health services.[1-4] There is no agreement on the constellation of signs, symptoms, and illnesses that a primary care physician should recognize as associated with a current or prior history of DV.[5-9] Agreement on such a compilation could alert practitioners about when to probe for DV in the patient's history. In addition, this constellation could serve as a basis for a standard targeted physical examination to be used with all female patients who have been abused. As one step toward informing the development of such a standard, this study elicits and describes information about signs, symptoms, and illnesses from subjects whose history of physical abuse is known. It also investigates differences in the effects of physical vs sexual intimate partner abuse. Last, it uses a sample of predominantly middle-class working women to investigate whether the health effects of DV in this group differ from those reported by other researchers from samples that consist of primarily lower-income women.

Domestic violence is a significant risk factor for various physical health problems frequently encountered in primary care settings. The most common locations for injuries among battered women are the face, neck, upper torso, breast, or abdomen.[5] These are the short-term consequences of battering that most health care professionals associate with DV. Yet, studies of battered women have found that the long-term aftermath of these injuries and the fear and stress associated with having an abusive intimate partner can re-

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PARTICIPANTS AND METHODS

SAMPLE

The sample is drawn from female health maintenance organization enrollees in the metropolitan Washington, DC, area. It represents a racially balanced and primarily highly educated group of middle-class working women. After Institutional Review Board approval from the participating Washington-area health maintenance organization at the national and regional levels, letters of invitation were sent to 21 426 women between the ages of 21 and 55 years who were continuously enrolled from January 1, 1995, through December 31, 1997. For safety reasons, letters (mailed in the fall of 1997 and the fall of 1998) did not mention abuse. They asked women to participate in a women's health survey. Twelve percent (n=2535) responded, indicating a time and telephone number where they could be reached for a private interview.

A professional survey company, whose interviewers were trained by the investigators (J.C., J.D., J.K., J.S., and A.C.G.), was used to conduct all interviews. At telephone contact, the interviewer described the nature of the study and obtained verbal consent. Of the 2535 women, 447 (18%) could not be located, 7 (0.3%) were ineligible because they were no longer enrolled, and 76 (3%) refused to participate, yielding a sample of 2005 women (79% of those eligible) who completed abuse screening interviews. Demographic information about eligible women who did not participate in the study was not available from the health maintenance organization. Consequently, no comparisons between the sample and the larger population can be made.

CASES AND CONTROLS

A modified version of the Abuse Assessment Screen[28] was administered to all 2005 women. Intimate partner violence (IPV) was defined as physical and/or sexual assault by a husband, partner, ex-husband, or ex-partner.[29] Three questions were used to identify women who had experienced IPV: Have you ever as an adult been physically abused by a husband, boyfriend, or female partner? Have you ever been hit, slapped, kicked, pushed or shoved, or otherwise physically hurt by a current or previous husband, boyfriend, or female partner? Have you ever been forced into sexual activities by a husband, boyfriend, or female partner? Two hundred one women (cases) responded yes to 1 or more of these questions and indicated that the abuse occurred between January 1, 1989, and December 31, 1997. The restriction on period for abuse was chosen to allow for development of health consequences without substantially interfering with the woman's ability to recall severity or other descriptive characteristics. Cases participated in an in-depth interview. A random sample of 240 women (controls) was drawn from those who reported never having experienced abuse and having been in an intimate relationship. These women were administered the same in-depth interview. Respondents to this interview received $15 sent by check to an address of their choice. A protocol derived from the Canadian DV telephone survey safety protocol of Johnson and Sacco[30] was used.

The sociodemographic characteristics of the sample are displayed in **Table 1**. Cases and controls differed significantly on all indicators except age. Cases were less likely to be college graduates, white, and married and to have an annual household income of $50 000 or more. (Abused women may be more likely to be single or divorced because of decisions to leave abusive relationships. This would tend to lower their household incomes relative to never abused women, who are more likely to be married and in a household with 2 incomes. Jones et al[31] provide further information on race and income differences as risk factors.) In our original analysis,[31] we found race and less than college education to be risk factors for DV. Because of these differences, weights were constructed as described later to standardize the 2 groups on these factors.

sult in several less obvious, and often long-term, health problems. These include pain or discomfort from recurring central nervous system (CNS) symptoms, such as headaches, back pain, fainting, or seizures.[6-15] Battered women also exhibit more signs, symptoms, and illnesses associated with chronic fear and stress, such as functional gastrointestinal disorders and appetite loss,[6,8,9,16] viral infections, such as colds and flu,[6,17,18] and cardiac problems, such as hypertension and chest pain.[8,18,19] Researchers have found battered women more likely to have gynecological (GYN) symptoms, such as sexually transmitted diseases, vaginal bleeding or infection, fibroids, pelvic pain, and urinary tract infections, all of which are also associated with sexual abuse.[6-9,18,20-23] Of the women who are physically abused by their intimate partners, 40% to 45% are forced into sexual activities by the partner. Another smaller percentage are sexually abused by their intimate partner, but not physically abused.[4,24,25] Sexual assault could explain the high prevalence of GYN problems reported by battered women. However, none of the studies measured forced sex separately.

Researchers[6-9] studied the health consequences of DV in 4 roughly comparable samples of women, but there was not always agreement about the types of health problems to investigate. For example, 2 studies[8,9] investigated digestive problems and 2[6,7] did not. These differences may reflect the variety of possible somatic responses to trauma and the different types of injuries abused women can experience. Despite the observed variability in patterns of health problems reported in these studies, there is agreement that battering has long-term emotional and physical health effects.[26,27]

RESULTS

GENERAL HEALTH

When asked to assess their general health, similar proportions of cases and controls estimated their health as good. However, when extremes of health status were examined, statistically significant differences between the 2 groups were observed (Table 2). At the lower ex-

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HEALTH MEASURES

Overall general health was measured using the general health perceptions subscale of the Medical Outcomes Study 36-Item Short-Form Health Survey, which has established reliability for diverse populations.[32] Physical health problems were measured by a modification of the Miller Abuse Physical Symptom and Injury Scale. This self-report scale lists 25 injuries, conditions, symptoms, and illnesses related to DV and asks if the woman visited a physician or nurse for this problem in the past 12 months. The scale was designed specifically for measuring long-term health consequences of battering. Content validity was established by an expert panel, and its test-retest reliability during a 2-year period on the history of violent injury portion was 0.63.[33] The Cronbach α test for reliability of the Miller Abuse Physical Symptom and Injury Scale in this study was 0.67.

In addition to specific health problems, 8 GYN symptoms or conditions, 5 chronic stress–related (ChS) symptoms or conditions, and 4 CNS problems were clustered, as indicated in **Table 2**. Internal relatedness was moderate among the items in the groups, as shown by Spearman ρ correlations between all possible pairs in each grouping (GYN problems, 14 of 21 pairs; ChS problems, 6 of 10 pairs; and CNS problems, 4 of 6 pairs; $P \leq .05$).

WEIGHTING AND STATISTICAL ANALYSIS

In calculating the differences in proportions between cases and controls, methods of direct adjustment were used to control for differences between the 2 groups in educational level, race, income, and marital status.[34] The standard population was the group of women who were screened for eligibility for this study (N=2005). This group was viewed as most representative of the population of interest, ie, a group of active female health maintenance organization enrollees. The weights were obtained by stratifying cases, controls, and the standard population separately on the 4 unbalanced variables. Contrasts were as follows: educational level (graduate degree, any college or 4-year college degree, and high school degree or less), race (white and all other), annual household income (<$50 000 and ≥$50 000), and marital status (married and all others). For each group, the cell frequency for each stratum was identified. Then, stratum-specific ratios of the cell frequency for the standard population were obtained. Weights were created for cases and controls by applying the stratum-specific ratio to each person within each stratum.

All proportions presented are based on the weighted data. However, because the weighted sample is much larger than the actual number of cases and controls, standard hypothesis tests based on comparisons of means or proportions would produce incorrect significance levels (ie, smaller SEs). To circumvent this problem and obtain correct estimates of statistical significance, analyses of the presence or absence of a single health problem were conducted using logistic regressions that included regressors to control for the factors that were unbalanced in the 2 groups. For counts of health problems, a negative binomial regression was used because it is a maximum likelihood method that is appropriate for overdispersed count data. (Count data are frequently modeled using Poisson maximum-likelihood regression. However, this distributional assumption requires that the mean of the distribution is equal to the variance. As is often the case with survey data, the variance of the study data was larger than the mean. Use of the negative binomial distribution relaxes the strict mean-variance relationship of the Poisson distribution, allowing the variance to exceed the mean.) Negative binomial regression, like Poisson regression, has the added advantage that coefficient estimates can be easily transformed to give the incidence rate ratio. (The transformation is like that for logistic regression coefficients when one wants to express them as odds ratios.) This yields a result that can be interpreted as the percentage increase in total number of symptoms for cases relative to controls.

treme, 12% of abused women rated their health as fair to poor compared with 6% of never abused women. At the other extreme, 35% of never abused women rated their health as excellent in contrast to only 26% of abused women.

SPECIFIC PHYSICAL HEALTH PROBLEMS

Headache, back pain, vaginal infection, and digestive problems are the most frequently reported problems in both groups, and each was significantly ($P<.05$) more frequently reported by abused women (Table 2). Other, less frequently occurring problems, were also reported significantly ($P<.05$) more frequently by abused women: sexually transmitted diseases, vaginal bleeding, painful intercourse, pelvic pain, urinary tract infection, loss of appetite, and abdominal pain. A significantly higher total number of health problems was reported by abused women ($P<.05$). When health problems were analyzed in clusters (GYN, ChS, and CNS problems), abused women reported 1, 2, or 3 or more problems more frequently.

NUMBER OF PHYSICAL HEALTH PROBLEMS

Comparisons of total health problems overall and within health problem clusters indicate that abused women had a roughly 60% higher rate of all problems relative to never abused women (incidence rate ratio, 1.58; 95% confidence interval, 1.34-1.86; $P \leq .001$). Negative binomial regression results indicate that incidence rate ratios range between 1.5 and 1.7 for the 3 health problem groups ($P \leq .001$).

SEXUAL ABUSE AND HEALTH PROBLEMS

Women who were sexually abused (with or without physical abuse) were more likely to have had 1 or more ChS or CNS health problems compared with physically abused women who did not report sexual abuse and never abused women. Interestingly, women who report only physical abuse are as likely to report at least 1 GYN problem as those who report sexual abuse (59% for both). Both groups were more likely to report at least 1 GYN problem than

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Table 1. Sociodemographic Characteristics of Abused and Never Abused Women (Unweighted)*

Characteristic	Abused Women (n = 201)	Never Abused Women (n = 240)	*P* Value
Age, y			
21-29	28 (14)	23 (10)	.47
30-39	61 (30)	81 (34)	
40-49	90 (45)	106 (44)	
50-56	22 (11)	30 (12)	
Ethnicity			
African American	109 (54)	97 (41)	<.05
White European	83 (41)	131 (55)	
Other†	9 (4)	10 (4)	
Marital status			
Married	73 (36)	115 (48)	<.01
Divorced or separated	50 (25)	36 (15)	
Widowed	33 (16)	7 (3)	
Single	45 (22)	82 (34)	
Education			
<High school	2 (1)	5 (2)	<.01
High school diploma	31 (18)	39 (17)	
Some college‡	69 (40)	61 (26)	
4-y degree	43 (25)	73 (31)	
Postgraduate school	26 (15)	57 (24)	
Household income, $			
<30 000	46 (24)	36 (15)	<.01
30 000-<50 000	71 (36)	65 (28)	
50 000-<80 000	48 (25)	72 (31)	
≥80 000	30 (15)	62 (26)	
Abuse type			
Physical only	123 (61)	. . .	. . .
Sexual only	12 (6)	. . .	
Physical and sexual	66 (33)	. . .	

*Data are given as number (percentage) of women unless otherwise indicated. Percentages are based on totals for each category, and may not total 100 because of rounding. Ellipses indicate data not applicable.

†The respective number of women in the abused and never abused groups is as follows: Asian, 4 and 2; Hispanic, 1 and 5; Middle Eastern, 1 and 1; and Native American, 2 and 2. In addition, 1 woman in the abused group was multicultural and 2 women in the never abused group refused to provide their ethnicity.

‡Including associate degree.

Table 2. Perceptions of General Health and Health Problems Reported by Abused and Never Abused Women in the Past Year (Weighted)*

Variable	Abused Women (n = 980)†	Never Abused Women (n = 1000)
General health		
Excellent‡	250 (26)	349 (35)
Poor‡	122 (12)	58 (6)
CNS problems		
Headaches‡	473 (48)	349 (35)
Fainting	66 (7)	26 (3)
Back pain§	389 (40)	252 (25)
Seizures	4 (<1)	0
GYN symptoms or conditions		
STDs§	63 (6)	23 (2)
HIV	5 (<1)	22 (2)
Vaginal bleeding§	165 (17)	65 (6)
Vaginal infection§	297 (30)	212 (21)
Pelvic pain‡	169 (17)	86 (9)
Painful intercourse§	126 (13)	69 (7)
Fibroids	111 (11)	143 (14)
Urinary tract infection‡	216 (22)	125 (12)
ChS symptoms or conditions		
High blood pressure	137 (14)	111 (11)
Loss of appetite‡	89 (9)	31 (3)
Abdominal pain‡	211 (22)	112 (11)
Digestive problem‡	345 (35)	192 (19)
Bad cold or flu	292 (30)	217 (22)

*Data are given as number (percentage) of women. Levels of statistical significance are based on an unweighted logistic regression controlled for marital status, race, educational level, and income. CNS indicates central nervous system; GYN, gynecological; STD, sexually transmitted disease; HIV, human immunodeficiency virus; ChS, chronic stress related.

†The abuse occurred between January 1, 1989, and December 31, 1997.

‡The difference between the 2 groups is significant ($P \leq .05$).

§The difference between the 2 groups is significant ($P \leq .01$).

controls (42%, $P<.005$). However, when the number of GYN problems was examined, a significant difference was apparent. Among women who experienced sexual abuse with or without physical abuse, 30% reported 3 or more GYN health problems compared with only 8% of those who experienced physical abuse alone ($P<.001$) and 6% of those never abused ($P<.001$).

Another large difference was seen with ChS problems; 78% of sexually abused women reported at least 1 ChS problem compared with 54% of women who reported only physical abuse ($P<.001$) and 45% of never abused women ($P<.001$). The differences in CNS symptoms among the 3 groups demonstrate the same patterns and similar magnitudes (69%, sexual abuse; 59%, physical abuse only [$P<.10$]; and 47%, never abused [$P<.001$]).

TIMING OF ABUSE

Only health problems that occurred in the 12 months preceding the interview were reported, but abuse could have occurred as long ago as 1989. Reports of 1 or more health problems in the 3 symptom clusters were examined relative to the timing of any reported abuse (abuse before last year, within the last year, or never). Although not significant, GYN and ChS problems seemed to be slightly more sensitive to the temporal proximity of the abuse than did CNS health problems. When the number of symptoms was examined, negative binomial regressions indicated that more health problems were reported when the lag between abuse and report was shorter (GYN problems, 1.47 [95% confidence interval, 1.24-1.74]; ChS problems, 1.40 [95% confidence interval, 1.21-1.62]; and CNS problems, 1.29 [95% confidence interval, 1.12-1.49]).

INJURIES

Few women reported injuries. The highest proportion of injuries ranged from 10% to 11% for sprains, with never abused women reporting the highest percentage. The relationship between the temporal proximity of abuse and injuries in the past year was investigated. Facial injuries were the only injury with statistically significantly different rates between women abused in the past 12 months and women abused before that (8% vs 1%; $P \leq .001$). Women who had never been abused had the lowest rate of facial injuries (0.4%). Other types of injury differed

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between women abused in the past 12 months and women abused before that, but the differences were not statistically significant. However, these differences may well be clinically important because they are 2 to 3 times larger among currently abused women: injuries requiring surgery (9% vs 4%; $P=.49$), bad burns (3% vs 2%; $P=.83$), and concussions (4% vs 0.6%; $P=.18$). They did not achieve statistical significance, probably because of the low frequency of occurrence. For these same injuries, the differences in rates between women abused more than 12 months before the interview and never abused women were within 0.5 percentage point.

COMMENT

LIMITATIONS

Two limitations of this study provide direction for future work. One is the absence of information about the women's physical or sexual abuse during childhood. Childhood abuse represents a potential confounding factor for later health problems. Silva and associates[35] found that 53% of battered women studied reported a history of physical and/or sexual child abuse, and Hulme[36] found that 82% of women with a history of severe child abuse were battered as adults. McCauley and associates[37] found that battered women in their primary care sample who were abused as children had long-term health consequences over and above what could be attributed to IPV. Another limitation of the present study is the lack of IPV and trauma history over the life course. Like IPV, all trauma a woman experiences will affect her physical health. Holman et al[38] found that 10% of 1456 adults interviewed in a low-income primary care clinic had experienced a traumatic event in the last year and that 57% experienced at least 1 event in their lifetime. Studies that examine the relationships among childhood abuse, lifetime trauma, IPV, and physical health problems will provide a better understanding of the relative effects of these factors on patient health.

RELATIONSHIP TO PREVIOUS RESEARCH

The finding of relationships between previous physical abuse and health problem clusters is consistent with others' findings of sexual abuse–related genital injuries (GYN problems),[22,39] physical health problems aggravated by stress (ChS problems),[19,27] and neurological injuries (CNS problems).[10,39] The causative mechanisms behind these findings have not been fully explored in prior research. This study attempted to verify the plausible hypothesis that the higher prevalence of GYN symptoms found herein and in other studies was related to the sexual assault that so often accompanies IPV.[40] (It is interesting that in addition to the usual overlap of physical and sexual abuse, 5% of the women reporting IPV in this sample reported intimate partner sexual assault as the only form of abuse.) Despite this relationship, forced sex has seldom been measured separately. Sexually transmitted diseases, pelvic pain, painful intercourse, fibroids, and urinary tract infections are not surprising, given battered women's descriptions of the forced anal, vaginal, and other abusive sex practices they experience.[40-42] Less overt, but equally abusive, are partners who have sex with other women but refuse to use safe sex practices.[22] Abused women report fearing to negotiate condom use because it might lead to further abuse.[43]

Contrary to expectation, women who reported forced sex in this sample were no more likely to report at least 1 GYN problem than those reporting physical abuse only. However, both abuse groups were more likely to report at least 1 GYN problem compared with controls. It is possible that the finding of no difference between the 2 abuse groups is a consequence of underreporting of forced sex among physically abused women because of its intimate nature. It is also possible that sexually controlling behaviors, such as affairs and unsafe sex, which were not measured in this study, are as problematic for women's GYN health as sexual assault. What is perhaps most interesting from a clinical standpoint is the finding that the number of GYN problems was greater among women who reported forced sex compared with either of the other 2 groups.

Also of interest from a clinical standpoint is the finding that women who were sexually assaulted had a higher probability of at least 1 CNS or ChS symptom than women who experienced physical abuse only. Both abuse groups were more likely than the never abused group to report at least 1 of these types of symptoms. The higher probability of ChS symptoms among women who report sexual assault could reflect deep shame related to any experience of sexual assault.[24] Alternatively, forced sex may serve as a proxy for more severe abuse.

The generally higher rate of ChS physical symptoms (eg, hypertension, chronic irritable bowel disorder, colds, and flu) found in abused women in this and other studies is most likely a consequence of physiological responses activated by abuse-induced stress. Increased or prolonged levels of stress could also potentiate or promote early expression of genetic factors or other lifestyle risks that lead to the development of these health problems.[16] Stress is known to depress the immune system, which could account for the observed higher rates of cold and flu symptoms. Research that leads to a better understanding of the causes of increased stress-related and immune suppression–related symptoms and syndromes in battered women is clearly warranted.

CLINICAL APPLICATIONS

Many of the symptoms found in this study and by others to be related to IPV are difficult to diagnose and/or hard to treat or control. Physicians who do not routinely screen for abuse may waste valuable time searching for other explanations or prescribing treatments that an abused woman will find impossible to follow (such as decreasing stress or using safe sex practices). This is one of the reasons that many health care professionals recommend routine screening for IPV according to a protocol developed by an interdisciplinary team of health care professionals expert in IPV.[44] These guidelines recommend that women be screened in primary care settings at their periodic (especially GYN) examinations and at all visits for a new complaint.

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Findings about partner sexual abuse demonstrate the need to routinely ask specifically about this aspect of IPV, particularly when multiple GYN symptoms are present. The Abuse Assessment Screen is a 4-question screen with established reliability and validity that has a separate forced sex question.[28] Physicians need to develop comfort in asking patients about sexual abuse, especially when seen for GYN, ChS, or CNS health problems.

When past or current IPV is identified, primary care physicians should obtain a focused history and perform a physical examination aimed at assessing the severity and timing of trauma, injuries, and GYN, CNS, and ChS problems. When abuse is ongoing, an intervention that conforms to recommended protocols should be undertaken (as described by Parsons et al[45] or Warshaw et al[46]). A woman may be too embarrassed to volunteer information about GYN problems or may not realize that other problems she is experiencing could be treated. Patients may also be experiencing emotional and psychiatric problems associated with abuse. Knowledge of abuse history will alert physicians to probe for these problems and conditions.

The temporal proximity of abuse was related to higher numbers of health problems, but there was also evidence that abused women remained less healthy over time. Physicians are becoming more aware of the immediate health problems associated with abuse and need to expand this awareness to those that persist or develop over time or that occur after the woman has left the abusive relationship. Many women may not associate these problems with previous abuse and, therefore, may not disclose abuse. This information may be vital in creating an effective treatment plan.

CONCLUSIONS

Screening is a necessary first step toward effective intervention and protection of abused women. However, the results of this study indicate that routine screening for IPV, which includes questions about forced sex, is important for women's long-term health and their immediate safety. Injuries, which have been viewed as the most obvious indicator of physical abuse in clinical settings, may not identify women who have long-term health problems related to abuse. Consequently, primary care providers who only screen for IPV when women present with an injury will miss most women who may be experiencing health problems as a consequence of abuse.

Some physicians may be uncomfortable with routine screening or believe that it is unnecessary among higher-income patients. Physicians whose practices are composed of higher-income working women should be aware that their patients are also at risk for short- and long-term negative health consequences of IPV. This sample of better-educated higher-income women had patterns of symptoms and illness that are similar to those found in lower-income samples. Moreover, research based on the women in this sample indicates that routine screening is an acceptable practice for most, even those who have never been abused (Gielen et al[47] provide a full analysis and discussion).

In the absence of screening or if a woman fails to report abuse to her physician, the results of this and other studies indicate that there are definite patterns of symptoms and illness that should alert physicians to probe sensitively for abuse in the health history. When women present with GYN problems, especially multiple problems, ChS problems, or CNS problems, primary care physicians should consider DV as one possible root cause. A sensitive in-depth assessment of these women can identify this important link. When a woman discloses abuse, the physician should include a targeted examination for these associated signs, symptoms, and illnesses and assess their association with the history of abuse. By doing this, physicians will have a positive effect on the health of women in their practice.

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