

Research Article

Prediction of Repeat Visits by Victims of Intimate Partner Violence to a Level III Trauma Centre

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Received 30 August 2012; Accepted 30 September 2012

Academic Editors: A. Banerjee, L. V. Downey, and F. Folke

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Background. The purpose of this study was to describe and contrast the population of persons presenting to a Vancouver hospital emergency department two or more times with those presenting once. **Methods.** Subjects for this study had disclosed intimate partner violence on at least one visit to Vancouver General Hospital Emergency Department during the study period 1997–2009. We compared sociodemographic characteristics, presenting complaints and disposition on discharge among single versus repeat visitors. **Results.** We identified 2246 single visitors and 257 repeat visitors. In a multivariate model, repeat visitors to the ER were more likely to be of First Nations (aboriginal) status, odds ratio (OR) 2.29, 95% confidence intervals (1.30–4.01); to have had a history of previous abuse 3.38 (1.88–6.08); to have received threats of homicide 2.98 (1.74–5.08); and to present with mental illness 3.03 (1.59–5.77). Police involvement was protective against repeat visits 0.54 (0.36–0.98). **Conclusion.** Persons with potential for multiple visits to the emergency room can be characterized by a number of factors, the presence of which should trigger targeted assessment for violence exposure in settings where assessment is not routine.

1. Background

Services highly utilized by victims of intimate partner violence include hospital emergency departments, which serve as major “points of entry” into the health care system [1]. Prompt identification of intimate partner violence victims in the emergency room (ER) has been demonstrated to permit interventions to be initiated with subsequent impact on health problems as well as health care utilization and costs [2]. Aside from needed attention for injuries, qualitative studies have indicated that acknowledgment of abuse and confirmation of the victims’ worth by health care providers is a powerful intervention that enables the victim to move toward safety [3].

The most obvious clinical presentation of intimate partner violence is injury. Studies in Australia and the United States have shown that the emergency department is a common point of entry to the health care system by victims of intimate partner violence [4–6]. In the only Canadian incidence study of intimate partner violence in the ER, 6%

of female victims presenting to the ER did so because of sequelae of intimate partner violence [7]. These patients experienced repetitive injuries, with about half having more than one injury at presentation [8].

American studies suggest that 10%–35% of all women presenting to ERs are there because of injury or illness related to chronic abuse [9–17]. One of the few studies looking at male victims presenting to emergency departments reported that 12.6% had been victims of intimate partner violence committed by a female partner within the preceding year [18]. An ER-based study from Sydney, Australia surveying 1169 men and women reported a history of intimate partner violence among 19% of patients [19]. The risk of exposure among females was more than twice that among males, relative risk (RR) 2.29 (95% confidence intervals, 1.62–3.23). Canadian national surveys have indicated that both men and women are perpetrators and victims of domestic violence but women are more than twice as likely to experience severe violence, including use of a weapon, and five times more

likely to receive medical attention [20]. Among 401 women interviewed in the ER by Bates et al. in an Australian teaching hospital, 26% reported a history of domestic violence [21]. Among these, injuries included bruising, fractures, and cuts. Eighteen percent suffered a fracture in the most recent episode of violence and 55% a hematoma. Among 29% of the women disclosing domestic violence, sexual assault was attempted or achieved, and among 20% disclosing violence, weapons were used in the attack.

Studies across the continents have also shown the frequent failure of health professionals to diagnose abuse [4, 6]. The detection rates of victims of intimate partner violence by nurses and doctors in the emergency departments have ranged from 5.0% to 16.0% [4, 10, 11, 16, 22]. Women arriving at trauma centres for intimate partner violence-related problems have been shown to be more likely to present during the night when staffing levels are lower and social workers are often not available to undertake detailed social histories [23, 24]. In our preliminary study, persons visiting the ER more than 20 times had, on average, not disclosed violence until the 13th visit [25].

To cloud the picture even further, intimate partner violence victims suffer from a myriad of health problems that bring them to emergency rooms, including medical, gynecological, or mental health problems [4, 24, 26–28]. In a population-based study undertaken in Australia, women experiencing intimate partner violence were found to have higher levels of stress, anxiety, depression, and other psychiatric disorders [29]. They experienced higher rates of alcoholism, were almost 5 times more likely to attempt suicide, and were 9 times more likely to abuse drugs. Thus, an approach to assessment targeting only injured patients fails to identify a significant number of persons who are victims of intimate partner violence. Among women coming to the emergency room specifically because of intimate partner violence in Bates' Australian study, only 23% presented with an injury [21].

Very little is known about predictors of injurious intimate partner violence. In the Australian studies, there were no significant differences between victims and nonvictims in education, religion, or employment, although victims were more likely to be under 30 years of age, divorced, or separated [21]. An American study reporting on emergency rooms in Denver, CO, USA, reported similarly that while women with a history of intimate partner violence were younger than nonabused women, no association was found between exposure and ethnicity, education, income, or pregnancy status.

1.1. Purpose. The overall purpose of this study was to describe and contrast the population of persons presenting to Vancouver hospital emergency departments two or more times in a twelve year period with those who have presented only once.

1.2. Objectives

- (1) To compare persons presenting at the emergency room with a history of intimate partner violence

exposure who are repeat presenters (\geq two times) in 12 years versus infrequent (once only) presenters:

- (a) sociodemographic characteristics;
- (b) injury profiles and presenting complaints;
- (c) use of hospital services (admission, length of stay, triage acuity, consultations);
- (d) referrals given to repeat versus infrequent presenters on discharge.

- (2) To develop a prediction model characterizing repeat visitors.

2. Methods

2.1. Design. This is a retrospective case control study utilizing data previously collected for routine care at Vancouver General Hospital.

2.2. Sample. Subjects for this study have been identified as being exposed to intimate partner violence on at least one visit to Vancouver General Hospital Emergency Department in Vancouver, BC, Canada during the study period 1997–2009. Vancouver General Hospital Emergency is the major trauma centre for the Province of BC and receives about 80% of emergency room admissions in the city of Vancouver. At Vancouver General Hospital, documentation by nursing and/or medical staff includes assessment for intimate partner violence. Staff receive training in assessing for intimate partner violence as part of their orientation to the emergency room. In-services are provided on a regular basis by the Domestic Violence Program Director. Patients are assessed in private and documentation takes place on standardized forms. These forms are part of the patient record and a carbon copy is forwarded by health records clerks to the Domestic Violence Program. There, the data administrator enters the data into a relational database.

2.3. Outcome Ascertainment. Our outcome of interest was repeat versus single visits to the ER among persons with a history of domestic violence exposure, identified from the Domestic Violence Program database. Frequent visitors are defined as individuals who had presented to the ER on two or more occasions. Controls are individuals who have presented to the ER only once during the study period. Our choice of a "cutoff" of two or more visits is based on the initial observation in our pilot study that 2.5% of all persons attending the emergency room with at least one disclosure had visited more than two times during a 10-year period. Each person in the Domestic Violence Database has a unique identifier; the medical record number (MRN). Repeat visits are identified through the presence of more than one entry for the MRN. With linkage to the VGH emergency room database using the MRN number, we identified all of the visits by an individual during the study period, regardless of whether or not intimate partner violence was disclosed.

2.4. Exposure Ascertainment. The sequence of visits is identified through dates attached to each visit. We assessed the

TABLE 1: Sociodemographics of domestic violence clients who visited the emergency room.

	Multiple visits <i>n</i> (%)	Single visits <i>n</i> (%)	Odds ratio 95% confidence intervals
	<i>n</i> = 257	<i>n</i> = 2246	
Gender of victim			
Female	245 (95.3)	2029 (90.3)	2.18 (1.20–3.96)
Male	12 (4.7)	217 (9.7)	
Gender of perpetrator			
Female	15 (5.8)	201 (8.9)	1.58 (0.92–2.73)
Male	242 (94.2)	2045 (91.1)	
Previous abuse by a different perpetrator	<i>n</i> = 165	<i>n</i> = 1357	
Yes	127 (77.0)	677 (49.9)	3.35 (2.30–4.90)
No	38 (23.0)	680 (50.1)	
Abused in childhood	<i>n</i> = 122	<i>n</i> = 1057	
Yes	78 (63.9)	488 (46.2)	2.07 (1.40–3.05)
No	44 (36.1)	569 (53.8)	
Victim relationship to perpetrator	<i>n</i> = 231	<i>n</i> = 1933	
Married/live in	144 (62.3)	1288 (66.6)	1
Dating	57 (24.7)	359 (18.6)	0.94 (0.62–1.42)
Separated/divorced	30 (13.0)	286 (14.8)	1.42 (1.02–1.97)
Ethnicity	<i>n</i> = 256	<i>n</i> = 2209	
European	127 (49.8)	1136 (51.8)	1.00
Chinese or other East Asia	14 (5.5)	470 (21.4)	0.27 (0.15–0.47)
India/Pakistan	6 (2.4)	121 (5.5)	0.44 (0.19–1.03)
Central/South America	5 (2.0)	64 (2.9)	0.70 (0.27–1.77)
Middle East	5 (2.0)	32 (1.5)	1.40 (0.53–3.65)
First Nations	98 (32.4)	371 (16.4)	2.36 (1.78–3.15)
Other	1 (0.4)	14 (0.6)	
Language spoken at home	<i>n</i> = 251	<i>n</i> = 2122	
English	223 (88.8)	1555 (73.3)	1.00
Chinese/Mandarin/Cantonese	6 (2.4)	201 (9.5)	0.21 (0.09–0.48)
Punjabi	4 (1.6)	82 (3.9)	0.34 (0.12–0.94)
Other	18 (7.2)	284 (13.4)	0.44 (0.27–0.73)
Age	<i>n</i> = 257	<i>n</i> = 2220	
10–19	9 (3.5)	136 (6.1)	0.93 (0.45–1.94)
20–29	48 (18.7)	676 (30.5)	1.00
30–39	86 (33.5)	678 (30.5)	1.79 (1.24–2.58)
40–49	73 (28.4)	420 (18.9)	2.45 (1.67–3.59)
50–59	25 (9.7)	168 (7.6)	2.10 (1.26–3.50)
60 and over	6 (2.3)	80 (3.6)	1.59 (0.88–2.88)

characteristics of women, the nature of the abuse and use of hospital services in relation to the most recent visit, and compared these variables among single versus repeat visitors. The Domestic Violence Record documents sociodemographic variables, nature of abuse including severity, onset, and frequency, use of weapons, ethnicity, psycho-social assessment, police involvement, and discharge teaching, destination, and referrals. Age, length of stay, arrival mode, chief complaint, triage acuity, procedures and services, and status at discharge are present on the emergency room database.

2.5. Linkage and Analysis. Data was extracted from the ER database to a Microsoft Access datafile and merged with the Domestic Violence Program database using a common unique identifier, the MRN or medical record number. Outcomes among our comparison groups were compared using *t*-tests for continuous variables and chi-square tests for discrete variables. A prediction model of repeat versus infrequent visits was developed using logistic regression. Variables were entered into the model one at a time, retaining the one with the smallest *P* value, then testing remaining

TABLE 2: Nature of Abuse.

	Multiple visits <i>n</i> (%)	Single visits <i>n</i> (%)	Odds ratio 95% confidence intervals
	<i>n</i> = 257	<i>n</i> = 2246	
Threat to kill victim	<i>n</i> = 191	<i>n</i> = 1530	
Yes	126 (66.0)	742 (48.5)	2.06 (1.50–2.82)
No	65 (34.0)	788 (51.5)	
Threat to kill victim family or friends	<i>n</i> = 60	<i>n</i> = 556	
Yes	16 (26.7)	87 (15.6)	1.96 (1.05–3.63)
No	44 (73.3)	469 (84.4)	
Police involved	<i>n</i> = 247	<i>n</i> = 2146	
Yes	120 (48.6)	1205 (56.2)	0.74 (0.57–0.96)
No	127 (51.4)	941 (43.8)	
Police involved in previous abuse	<i>n</i> = 164	<i>n</i> = 1154	
Yes	121 (73.8)	604 (52.3)	2.56 (1.78–3.69)
No	43 (26.2)	550 (47.7)	
Onset of abuse	<i>n</i> = 200	<i>n</i> = 1715	
First month	44 (23.4)	337 (20.8)	1.73 (0.87–3.45)
First year	88 (46.8)	647 (40.0)	1.81 (0.99–3.46)
1–5 years	39 (20.7)	425 (26.3)	1.22 (0.61–2.44)
5–10 years	6 (3.2)	64 (4.0)	1.24 (0.44–3.51)
>10 years	11 (5.9)	146 (9.0)	1.00
Frequency of physical abuse	<i>n</i> = 198	<i>n</i> = 1717	
None	1 (0.5)	21 (1.2)	0.46 (.06–3.47)
First time	22 (11.1)	355 (20.7)	0.60 (0.39–0.98)
Constant	16 (8.1)	95 (5.5)	1.62 (0.91–2.9)
Frequent (weekly, monthly)	87 (43.9)	550 (32.0)	1.53 (1.10–2.13)
Unpredictable	72 (36.4)	696 (40.5)	1.00
Weapon used	<i>n</i> = 193	<i>n</i> = 1843	
Yes	27 (14.0)	404 (21.9)	0.58 (0.38–0.88)
No	166 (86.0)	1439 (78.1)	1.00
Threatened with a weapon	<i>n</i> = 189	<i>n</i> = 1764	
Yes	17 (9.0)	134 (7.6)	1.20 (0.71–2.04)
No	172 (91.0)	1630 (92.4)	1.00

variables in an iterative process until addition of variables did not improve goodness of fit statistics as measured by the model chi square statistic. We did not compute odds ratios when counts in either comparison group were as low as one or zero. We did not undertake sample size calculations prior to the study as we did not have pilot data on which to conduct these analyses and were not able to find similar studies in the literature from which we could draw baselined data.

Prior to commencing our study, we obtained a certificate of ethical approval from the University of British Columbia Clinical Research Ethics Board and from the Vancouver Coastal Research Institute.

3. Results

3.1. Sociodemographic Characteristics. Among visitors to the VGH emergency department who were exposed to domestic

violence (Table 1), repeat visitors were more likely to be female, odds ratio (OR) 2.18, 95% confidence intervals (1.20–3.96), to be separated or divorced compared to married 1.42 (1.02–1.97), to be First Nations (aboriginal) 2.36 (1.78–3.15), and be of middle age 2.45 (1.67–3.59), (40–49 versus 20–29). Repeat visitors were less likely to be of Chinese or of East Asian descent 0.27 (0.15–0.47). They were more likely to have been abused as children 2.07 (1.40–3.05) and more likely to have had multiple abusers as adults 3.35 (2.30–4.90).

3.2. Nature of Abuse. Repeat visitors were more likely to have received threats to kill 2.06 (1.50–2.82) and to have their family threatened 1.96 (1.05–3.63) (Table 2). They were more likely to have had police involvement in previous incidents 2.56 (1.78–3.69) but not the most recent incident. They were more likely to describe the abuse as frequent

TABLE 3: Children in the home ($n = 818$).

	Multiple visits n (%)	Single visits n (%)	P value
	$n = 47$	$n = 771$	
Children are witness			0.66
Yes	30 (63.8)	467 (60.6)	1.15 (0.62–2.12)
No	17 (36.2)	304 (39.4)	1.00
Children are victims			0.03
Yes	2 (4.3)	121 (15.7)	0.24 (0.06–0.98)
No	45 (95.7)	650 (84.3)	1.00
Ministry of Children and Family Development involved			0.08
Yes	15 (31.9)	162 (21.0)	1.76 (0.93–3.33)
No	32 (68.1)	609 (79.0)	1.00
Ministry of Children and Family Development notified			0.70
Yes	6 (12.8)	114 (14.8)	0.84 (0.35–2.03)
No	41 (87.2)	657 (85.2)	1.00

TABLE 4: Use of hospital services.

	Multiple visits n (%)	Single visits n (%)	P value	Odds ratio 95% confidence intervals
	$n = 257$	$n = 2246$		
Admitted to ER				
Yes	123 (49.7)	888 (39.5)	0.94	1.40 (1.08–1.82)
No	226 (80.4)	778 (80.6)		
Length of stay (min) mean (SD)	408.9 (394.3)	343.6 (394.6)	0.03	(diff) 65.3 (4.8–125.9)
Acuity	$n = 186$	$n = 1351$.002	
Emergency	23 (12.4)	127 (9.4)		2.38 (1.18–4.80)
Urgent	73 (39.2)	558 (41.3)		1.72 (0.94–3.11)
Semiurgent	76 (40.9)	482 (35.7)		2.07 (1.14–3.76)
Nonurgent	14 (7.5)	184 (13.6)		1.00
Arrival Mode	$n = 185$	$n = 1347$	<.001	
Ambulance	98 (53.0)	512 (38.0)		1.88 (1.38–2.57)
Police	3 (1.6)	6 (0.7)		3.27 (0.87–12.34)
Walk-in or private vehicle	84 (45.4)	826 (61.3)		1.00
Presenting complaint	$n = 179$	$n = 1300$		
Physical	124 (69.3)	946 (72.8)	.04	1.00
Mental	31 (17.3)	176 (13.5)		1.34 (0.88–2.06)
Addiction	10 (5.6)	30 (2.3)		2.54 (1.21–5.33)
Assault	8 (4.5)	87 (6.7)		0.70 (0.33–1.48)
Domestic violence named	6 (3.4)	81 (4.7)		0.78 (0.32–1.77)

1.53 (1.10–2.13) compared to unpredictable. They were less likely to report use of a weapon 0.58 (0.38–0.88). In homes where children were present, Ministry of Children and Family Development involvement was more frequent 1.76 (0.93–3.33), and victimization of the children less frequent 0.24 (0.06–0.98) (Table 3).

3.3. Use of Hospital Services. Repeat visitors were admitted to the ER at the same rate as single visit victims of domestic violence (Table 4); however, they had statistically significantly longer stays in the ER 408.9 (394.3) minutes versus

343.6 (394.6), $P = .03$. In terms of triage acuity, they were significantly more likely to be classified as emergency versus nonurgent 2.38 (1.18–4.80). They were more likely to arrive by ambulance compared to walk-in or private vehicle 1.88 (1.38–2.57). Repeat visitors were more likely to present with problems related to addiction 2.54 (1.21–5.33). There were no differences in presenting complaints stated as domestic violence.

3.4. Referrals and Treatment. While in emergency, repeat visitors were more likely to receive consultation from the

TABLE 5: Disposition of clients from ER.

	Multiple visits <i>n</i> (%)	Single visits <i>n</i> (%)	<i>P</i> value
Disposition on Discharge	<i>n</i> = 185	<i>n</i> = 1349	
Home	132 (71.0)	1039 (77.0)	
Nursing care facility	0	4 (0.3)	
Community care facility	2 (1.1)	5 (0.4)	3.52 (0.68–18.21)
Transferred to another hospital	3 (1.6)	5 (0.4)	5.29 (1.26–22.28)
Discharge against medical advice	3 (1.6)	17 (0.8)	1.55 (0.45–5.32)
Admitted to a nursing unit	34 (18.3)	211 (15.6)	1.47 (1.00–2.17)
To doctor's office	0	3 (0.2)	
To police/corrections	1 (0.5)	2 (0.1)	
Expired	0	2 (0.1)	
Left without being seen	9 (4.8)	53 (3.9)	1.50 (0.73–3.08)
Left before treatment complete	2 (1.1)	8 (0.6)	1.82 (0.38–8.65)
Discharge diagnosis	<i>n</i> = 104	<i>n</i> = 804	
Physical illness or injury	70 (67.3)	624 (78.2)	0.57 (0.37–0.89)
Mental health	19 (18.3)	108 (13.5)	1.42 (0.84–2.44)
Addiction	9 (8.7)	28 (3.5)	2.61 (1.19–5.69)
Assault	6 (5.8)	38 (4.8)	1.22 (0.51–2.97)

following patient services: internal medicine 4.79 (1.86–12.12) and psychiatry 1.37 (0.47–3.95) but not more likely to receive consultations from cardiac care, dentistry, family practice, gastroenterology, general surgery, gynecology, intensive care, neurology, ophthalmology, orthopedics, otorhinolaryngology, plastic surgery, respirology, or urology (data not shown). They were significantly more likely to receive care from patient care services, specifically emergency medicine 1.68 (1.25–2.26) or internal medicine 5.10 (2.94–9.16) but not from any of the aforementioned services or vascular surgery, burns, cardiology, neurosurgery, or trauma services. They were significantly more likely to be admitted to a hospital nursing unit 1.47 (1.00–2.17) and to be transferred to a different hospital 5.29 (1.26–22.28) (Table 5). Discharge diagnoses were consolidated into 25 different categories, and these were further collapsed into four categories to allow sufficient numbers in each category for comparison: physical illness, mental health, addiction, and assault. The odds of repeat visitation were elevated in association with addiction as a discharge diagnosis 2.61 (0.51–2.97). Interestingly, domestic violence was not named as a discharge diagnosis for any patient.

3.5. Prediction of Repeat Visits. Among all of the variables significant in a univariate analysis, only five remained statistically significantly associated with multiple visits in a multivariate analysis. These were ethnicity; aboriginal 2.29 (1.30–4.01); previous abuse by a different perpetrator 3.38 (1.88–6.08); threat to kill the victim 2.98 (1.74–5.08); chief presenting complaint; mental illness 3.03 (1.59–5.77). Police involvement was protective against repeat visits 0.54 (0.36–0.98).

4. Discussion

Our study highlights the potential of health professionals in the emergency room to identify those at risk of repeated violence severe enough to require visits to the ER. In a level III trauma centre servicing 80% of a major urban Canadian city, we report sociodemographic and abuse-related factors that are different in patients presenting for multiple visits than in single presenters. Addiction and mental illness, not trauma, were the 2 most common presenting complaints to the emergency room. Our data would suggest that women of aboriginal descent, who have experienced previous abuse with a different perpetrator, who have been threatened with murder, and who have had previous police involvement as well as those with mental health problems, are most likely to be repeat visitors to the ER and thus to have greater utilization of hospital resources and services.

To the best of the authors' knowledge there has been no other work investigating the risk factors for repeat visits to the ER among victims of intimate partner violence. One study, conducted by Kramer et al. in 2004 examines the prevalence of intimate partner abuse amongst women presenting to an emergency room or primary healthcare facility without distinguishing whether the women were a first or repeat visitor [30]. Contrary to our findings in which repeat victims tended to be of middle age, the authors report the highest rate of physical abuse among younger women, with reports of recent physical abuse decreasing with increasing age. Similar to our findings, the study notes that abused women presenting to the ER reported a variety of health complications, many not directly related to violence.

In Washington State, Kernic et al. investigated hospital admissions of women who later filed for protection orders

due to partner violence in the home [31]. This study, however, did not differentiate between repeat and single visitors. Similar to our study, the authors report women known to be victims of intimate partner violence to have an increased risk of admission to hospital with psychiatric disorders compared to nonabused women and to have increased risk of admissions for all diagnoses in general. This finding and the results of the current study support the notion that victims of intimate partner violence may be presenting to the healthcare system with symptoms and diagnoses seemingly unrelated to the violent acts they have been exposed to.

If ER caregivers can be persuaded at a *minimum* to assess and document individuals at highest risk of ongoing violence exposure, they create otherwise missed opportunities to undertake safety planning and referral. Any risk factor for repeated visits should be incorporated into follow-up questions for women who have disclosed violence at any time in their health history. These include aboriginal ethnicity, previous abuse by a different perpetrator, threat of homicide, onset of violence in the first year of relationship, frequent (weekly or monthly) abuse, arrival by ambulance, and having addiction or mental illness as a presenting complaint. The utility of safety planning in preventing violence has been supported by randomized controlled trials in maternity care settings [32, 33] and shelters [34]. Accurate identification in the emergency room of those at highest risk of repeated violence provides health care providers with the opportunity to not only diminish morbidities, but to reduce ER admissions for repeat visits as a whole.

Acknowledgments

The authors would like to acknowledge the Vancouver Coastal Research Institute for funding this project.

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