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Risk factors for injury to married women from domestic violence in Hong Kong

香港已婚女性因家庭暴力而受傷的風險因素

Objective. To examine risk factors for injury to married women from domestic violence in Hong Kong.
Design. Case control study.
Setting. Regional public hospital, Hong Kong.
Patients. All married women aged 18 to 60 years who attended an accident and emergency department for treatment of a domestic violence injury from January 2004 to June 2005.
Main outcome measures. Social and health characteristics of abused women and their husbands.
Results. A total of 293 cases were compared to 313 controls. Eight predictive variables were found to be significant by univariate analysis: woman who is a new immigrant (P=0.003), woman with no job (P=0.019), husband with low educational level (P<0.001), presence of extramarital affairs (P<0.001), husband's unemployment (P<0.001), husband's alcohol abuse (P<0.001), husband's illicit drug abuse (P=0.032), husband's mental illness (P<0.001). Five factors were found to be significant in a logistic regression analysis: husband with a low educational level (nil to primary) [adjusted odds ratio=2.78; 95% confidence interval, 1.149-6.727], husband unemployed (adjusted odds ratio=9.031; 95% confidence interval, 5.163-15.796), presence of extramarital affairs (adjusted odds ratio=5.218; 95% confidence interval, 2.899-9.395), husband's alcohol abuse (adjusted odds ratio=6.089; 95% confidence interval, 3.460-10.716), husband's mental illness (adjusted odds ratio=9.443; 95% confidence interval, 2.351-37.926).
Conclusions. Several significant risk factors have been identified for injury incurred during domestic violence to married women in Hong Kong. It provides information useful for developing local preventive strategies.

目的：研究香港已婚女性因家庭暴力而受傷的風險因素。
設計：病例對照研究。
安排：地區公立醫院，香港。
患者：2004 年 1 月至 2005 年 6 月期間，所有因家庭暴力受傷而進入急症室接受治療的 18 至 60 歲已婚女性。
主要結果測量：受虐女性及其丈夫的社會和健康特徵。
結果：是次研究的病人有 293 人，對照組有 313 人。單一變數分析發現了八個明顯的預測因素：女性為新移民（P=0.003）、女性沒有工作（P=0.019）、丈夫教育水平低（P<0.001）、有婚外情（P<0.001）、丈夫失業（P<0.001）、丈夫酗酒（P<0.001）、丈夫濫用違禁藥物（P=0.032）和丈夫有精神病（P<0.001）。邏輯回歸分析則發現五個明顯的因素：丈夫教育水平低（沒受教育或小學程度）[經調整風險比率 =2.78；95% 置信區間，1.149-6.727]、丈夫失業（經調整風險比率 =9.031；95% 置信區間，5.163-15.796）、婚外情出現（經調整風險比率 =5.218；95% 置信區間，2.899-9.395）、丈夫酗酒（經調整風險比率 =6.089；95% 置信區間，3.460-10.716）和丈夫有精神病（經調整風險比率=9.443；95% 置信區間，2.351-37.926）。
結論：是次研究發現數個香港已婚女性發生家庭暴力受傷的風險因素，對制定本港的預防策略提供有用資料。

Key words:
Battered women;
Domestic violence;
Risk factors

關鍵詞：
受虐女性；
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Introduction

The rapid demographic, social, and economic changes in Hong Kong have

weakened family solidarity and resulted in an increasing number of socially pathological incidents, especially domestic violence. The number of newly reported battered spouse cases increased from 1009 in 1998 to 2433 in 2001, and rose further to 3298 in 2003. From January 2005 to June 2005, 1620 new battered spouse cases have been reported, with 90% of victims being female.[1,2] A number of family tragedies that have happened in recent years have hit not only newspaper headlines but also the hearts of Hong Kong people. The Social Welfare Department (SWD) started to take a lead by providing support to families in need as well as coordinating the efforts of various government departments, non-governmental organisations, professionals, and the community to prevent and combat domestic violence. The former Chief Executive also expressed deep concern about domestic violence incidents and decided to add resources to the relevant services during his 2005 policy address.[3]

Although extensive research has been done on battered spouses in developed and underdeveloped countries, the prevalence and risk factors for being a battered spouse are poorly understood in China.[4] Few studies in Hong Kong have uncovered the prevalence, risk factors, and protective factors for this important socio-medical issue. Leung et al[5] reported that 17.9% of pregnant women attending an antenatal clinic in 1998 had a history of being abused, mostly in the form of verbal threats. Wong et al[6] conducted a study on a population in eastern Hong Kong Island, describing the pattern of domestic violence presenting to an accident and emergency department (AED). The pattern of injuries and demographic and social profiles of 72 identified victims were reported. However, the significance of different social factors on the risk of domestic violence could not be examined because of the study design. An incidence rate of 7 per 10 000 AED attendances was reported; this low incidence rate may be due to under-reporting.[6] The first study commissioned by the SWD in 2005 reported a lifetime prevalence rate of spouse battering as 13.9% to 15.1% and analysed the demographic, social, psychological, and family profiles of perpetrators and victims.[7] The data were collected using a household survey involving face-to-face interviews. However, the study only examined the significance of some socio-economic and personality factors but did not assess other risk factors, especially health characteristics such as alcohol abuse, drug abuse, mental illness, and chronic illness among the abusers. In this study, we examined the significance of risk factors for domestic violence in Hong Kong with respect to the social and health characteristics of married women and their husbands.

Methods

This case-control study was conducted on all married women aged 18 to 60 years who attended the AED of a regional hospital in Hong Kong for an injury caused by domestic violence from January 2004 to June 2005. The regional hospital serves a population of more than one million in the western New Territories, with a daily attendance of around 600 patients. This hospital is the only referral hospital for medical treatment of domestic violence injuries identified by the police or social workers in the region. According to SWD statistics on battered spouses, 31% of newly reported cases from January 2005 to June 2005 came from the population served by this regional hospital.[1] Women who were not Hong Kong residents at the time of presentation were excluded. Trained triage nurses screened and identified women whose injuries were suggestive of domestic violence. Emergency physicians who treated the victims performed the interview. A set of standard questions was used to collect the socio-economic and health characteristics of the abused woman and her husband. The answers were documented on a standard record sheet (which became part of the hospital record history notes) for later compilation and analysis. Socio-economic and health characteristics of the abusers were based on the victims' responses.

A control group representing the study variables in the source population was recruited from June 2005 to August 2005, with a control ratio of nearly one to one (293 cases to 313 controls). The control group was composed of women who were seen in the AED for medical reasons other than domestic violence and who self-reported that they had not suffered from domestic violence in the past 3 years. Two research assistants identified, selected, and interviewed consecutive female patients presenting to the AED during different periods. Emergency department–based controls were considered more appropriate than population-based controls because the same selection criteria for medical intervention were used.[8,9]

The Chi squared test was used to evaluate the significance of each categorical and ordinal variable. Student's *t* test (two-tailed) was used to compare the equality of means for continuous variables. A multiple logistic regression analysis was used to examine the independent significance of predictive variables. Variables with a P value of 0.05 or less were included in the logistic regression analysis. Odds ratios (ORs) were used to estimate relative risks. The Hosmer and Lemeshow test was used to test the goodness of fit of the model.

The Cluster Clinical Research and Ethics Committee of the Hospital Authority approved the study and exempted us from getting informed consent from each battered woman, as in other retrospective studies or audits reporting pooled data retrieved from medical records. Informed consent was required for the control group.

Results

Of the 293 married women injured during domestic violence, the missing values ranged from 0.7% to 5.4%. A total of 439 contusions and abrasions, 13 lacerations and cut wounds

Table 1. Univariate analysis of all predictive variables for domestic violence

Predictive variables	Battered women, n=293	Controls, n=313	P value (asymmetric, two-tailed)
Married women			
Age (mean±SD) [years]	37.0±8.7	37.6±8.3	0.406
Time living in Hong Kong (mean±SD) [years]	20.2±16.5	25.0±16.6	<0.001
New immigrant, No. (%)			0.003
Yes	177 (60.4%)	151 (48.2%)	
No	116 (39.6%)	162 (51.8%)	
Education level, No. (%)			0.149
Nil to primary	83 (28.3%)	70 (22.4%)	
Secondary	193 (65.9%)	223 (71.2%)	
Above secondary	13 (4.4%)	20 (6.4%)	
Unknown	4 (1.4%)		
Employment status, No. (%)			0.019
With job	93 (31.7%)	128 (40.9%)	
No job	200 (68.3%)	185 (59.1%)	
Husbands			
Education level, No. (%)			<0.001
Nil to primary	110 (37.5%)	70 (22.4%)	
Secondary	150 (51.2%)	212 (67.7%)	
Above secondary	14 (4.8%)	31 (9.9%)	
Unknown	19 (6.5%)		
Employment status, No. (%)			<0.001
With job	169 (57.7%)	292 (93.3%)	
No job	122 (41.6%)	21 (6.7%)	
Unknown	2 (0.7%)		
Extramarital affairs, No. (%)			<0.001
Yes	72 (24.6%)	24 (7.7%)	
No	205 (70.0%)	289 (92.3%)	
Unknown	16 (5.5%)		
Alcohol abuse, No. (%)			<0.001
Yes	105 (35.8%)	23 (7.3%)	
No	186 (63.5%)	290 (92.7%)	
Unknown	2 (0.7%)		
Illicit drug abuse, No. (%)			0.032*
Yes	7 (2.4%)	1 (0.3%)	
No	283 (96.6%)	312 (99.7%)	
Unknown	3 (1.0%)		
Mental illness, No. (%)			<0.001
Yes	21 (7.2%)	3 (1.0%)	
No	268 (91.5%)	310 (99.0%)	
Unknown	4 (1.4%)		
Chronic illness, No. (%)			0.753
Yes	26 (8.9%)	26 (8.3%)	
No	262 (89.4%)	287 (91.7%)	
Unknown	5 (1.7%)		

* Fisher's exact test

requiring suturing procedures, and five bone fractures were found in the 293 women. A weapon was used on 57 (19%) women. Verbal threats were used against 100 (34%) women. Sixty-seven (23%) of cases were a first episode of violent attack, 43 (15%) a second episode, and 183 (62%) multiple episodes (ie 3 or above).

As shown in Table 1, the mean number of years the battered women had lived in Hong Kong was significantly lower than that for the controls (mean difference, -4.8; 95% confidence interval [CI], -7.5 to -2.2; P=0.001, two-tailed). The age distribution in both groups was not significantly different (mean difference, -0.6; 95% CI, -7.8 to 1.9; P=0.406, two-tailed). Eight predictor variables with significant P values were analysed using a Chi squared test, including wife as new immigrant (P=0.003), wife's unemployment (P=0.019), husband's low education level (P<0.001), presence of extramarital affairs (P<0.001), husband's unemployment (P<0.001), husband's alcohol abuse (P<0.001), husband's illicit drug abuse (P=0.032), and husband's mental illness (P<0.001).

For the multivariate analysis, nine selected predictor variables (P<0.05 in the univariate analysis) were included in a logistic model for initial analysis. Four factors, namely wife's number of years living in Hong Kong, wife as a new immigrant, wife's unemployment, husband's illicit drug abuse, were excluded from the final logistic regression analysis because they became insignificant during the initial multivariate analysis. The remaining five factors (P≤0.05) were included in the final logistic regression analysis, namely, husband's education level of nil to primary, husband's unemployment, the presence of extramarital affairs, husband's alcohol abuse, and husband's mental illness. Their adjusted ORs with 95% CI are shown in Table 2.

Table 2. Multivariate logistic regression analysis of significant predictive variables for domestic violence

Predictive variables of husbands	%	No.	Odds ratio	95% CI	P value
Education level					
Nil to primary	61.1	110/180	2.78	1.149-6.727	0.023
Secondary	41.4	150/362	1		
Above secondary	31.1	14/45	1.215	0.521-2.829	0.652
Employment status					
With job	36.7	169/461	1		
No job	85.3	122/143	9.031	5.163-15.796	<0.001
Extramarital affairs					
Yes	75.0	72/96	5.218	2.899-9.395	<0.001
No	41.5	205/494	1		
Alcohol abuse					
Yes	82.0	105/128	6.089	3.460-10.716	<0.001
No	39.1	186/476	1		
Mental illness					
Yes	87.5	21/24	9.443	2.351-37.926	0.002
No	46.4	268/578	1		

Discussion

To examine risk factors for injury to married women as a result of domestic violence, we focused on the social factors for both the victim and her abuser, as well as the health characteristics of the abuser including alcohol abuse, drug abuse, mental illness, and chronic illness. A case-control study design was used because it is better than a cross-sectional study for establishing a clear cause-effect relationship.

'Woman with no job' was a significant factor in the univariate analysis, similar to other studies which reported that a significantly higher proportion of domestic violence victims in Hong Kong were homemakers without paid employment.[7,10] The woman's education level was not a significant risk factor in the univariate analysis done in our study, contrary to findings in other studies.[7,10] Wong et al[6] reported that a high proportion of domestic violence victims had lived in Hong Kong for less than 7 years. Our results suggested that women who have recently migrated to Hong Kong may be at a higher risk for domestic violence injury, but this was not found to be a significant risk factor independent from other factors during the multivariate analysis. Most of the husband's predictive variables examined in this study were significant risk factors except chronic illness and illicit drug abuse. Illicit drug abuse was a significant risk factor in the univariate analysis but became insignificant during the multivariate analysis. This was probably due to the low frequency of drug abuse in both the victim and control groups. Mental illness in the husband was found to have the highest adjusted OR (9.443; 95% CI, 2.351-37.926), however the result should be interpreted with caution because of its wide CI. Other strong predictors included husband's unemployment (adjusted OR=9.031; 95% CI, 5.163-15.796) and husband's alcohol abuse (adjusted OR=6.089; 95% CI, 3.460-10.716) were similar to reports from other regions.[4,11]

This study has a number of limitations. First, the definition was not clear for some variables, especially chronic illness and mental illness. Second, we did not use a validated screening tool to define the status of alcohol abuse or drug abuse. Third, we interviewed only women and the classification of their husbands' variables depended on the response of the women, therefore subjecting these to substantial recall and misclassification errors with or without intention. Misclassification may have biased the result away from the null hypothesis, as the victims were more likely to over-report abusers' pathological behaviours such as alcohol abuse to shift the blame to the husbands.

We evaluated the association of health characteristics with domestic violence on husbands only; the significance of victims' health characteristics was not examined. With alcohol abuse, a high degree of concordance between spouses with respect to heavy drinking was demonstrated.[12] The effect of alcohol abuse in the victim may confound the effect of alcohol abuse in the abuser and vice versa.[13] Both the drinking pair effect and dose-response effect were not evaluated. In fact, the precise effect of alcohol on the abuser's act of inflicting injury to the wife is very complicated. It could be a direct causal factor, an indirect factor, or an effect modifier. Our result could only be interpreted as husband's alcohol abuse being a significant risk factor for domestic violence injury. Further information on the precise effect of alcohol on the act was not provided.

Another limitation is the possibility of selection bias. Although the control group was selected from the same AED populations as the victim group, we could not exclude the presence of uncovered factors related to domestic violence that may lead the victims to visit AED more frequently than the general population and may therefore influence the selection. We tried to limit this possibility by recruiting controls with a wide variety of reasons for visiting the AED, ensuring no single reason dominated.

Young age has been identified as a risk factor for domestic violence injuries in other studies.[14] Chan et al[10] also reported that a higher proportion of victims were in the

age-group of 35 to 45 years. To limit the effect of age as a confounder, a control group of similar age distribution to that of the case group was recruited using a block sampling technique. We first divided the age range of 18 to 60 years old into six age blocks, and then we determined the relative frequency of our cases belonging to different age blocks. Based on this relative frequency, we were able to plan the numbers of controls we needed to recruit in each age block. In fact, the mean age of the case group was only 0.6 year younger than the mean age of the control group; the difference was not statistically significant (95% CI, -7.8 to 1.9; P=0.406, two-tailed).

This study is the first hospital-based case-control study in Hong Kong examining the significance of different socio-economic and health characteristics of married women and their husbands on domestic violence injuries. Despite the study limitations, we were able to demonstrate that husband's unemployment, husband's alcohol abuse, husband's low educational level (nil to primary), the presence of extramarital affairs, and husband's mental illness were significant risk factors for domestic violence injuries in Hong Kong women. Our study provides a better understanding of this socio-medical issue and forms a basis for development of future preventive strategies. Attention should be focused on identification of at-risk husbands and on preventing them from becoming abusers.

In this small-scale, single-centre study, the significance of social factors for female victims of domestic violence was not established due to the study limitations. The small sample size may have inadequate statistical power to demonstrate their effects. Some possible risk factors were not addressed including violence across generations, a history of child abuse, and the abuser's personality factors. Therefore, structural multi-centre studies with larger sample sizes should be performed to tackle the problem and to examine more potential risk factors. Further studies to evaluate the effect of alcohol should also be conducted to provide information on this complex issue.

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