The University of Notre Dame Australia

Medical Papers and Journal Articles

School of Medicine

2014

# Domestic violence is a leading risk factor in default from colposcopy services

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**This is the peer reviewed version of the following article:**

Title

Domestic violence is a leading risk factor in default from colposcopy services.

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Running title

Domestic violence a risk for default

**Abstract**

Aim: Domestic violence is common in women and is associated with poorer healthcare outcomes. However, no causal pathway has been identified to explain this observation. We have followed a cohort of women to determine whether poorer outcomes can be explained by high rates of default and lost to follow up.

Methods: A prospective cohort study was performed. Institutional ethics approval was obtained. Participants were consecutive patients attending colposcopy clinics at a major metropolitan hospital in Australia.  Following ascertainment of domestic violence status, appointment outcomes for colposcopy services were tracked for a three-year period. Multivariate analysis was undertaken to determine demographic factors associated with default from care and loss to follow up.

Results: Of 581 women approached, consent was obtained from 574 women (99%). Domestic violence status was obtained from 566 women, of whom 187 (33%) had a recent history of exposure. Women exposed to violence were more likely to default from colposcopy once (26.2% vs 7.4%; p<0.0001), twice (11.2% vs 3.2%, p=0.0001), or thrice (10.7% vs 2.4%, p<0.0001). They were more likely to be lost to follow up (8.0% vs 1.1%, P<0.0001). In multivariate analysis exposure to domestic violence remained significantly associated with default and loss to follow up.

Conclusion: Domestic violence is a risk factor for default from attendance and lost to follow up at colposcopy services. This may explain the mechanism behind adverse healthcare outcomes seen. Screening and targeted appointment intervention programs may improve clinical compliance.

**Keywords: domestic violence, colposcopy, default, noncompliance, loss to follow up**

**Word count 238**

**Introduction**

Domestic violence is common. Statistics vary, but surveys place the lifetime prevalence of intimate partner violence against women at between 25% to 30% and the annual prevalence between 2% to 12% (1-7).

Domestic violence is associated with adverse healthcare outcomes in women (1-7). It is a common comorbidity in women presenting to healthcare services. Much, but not all, of the adverse healthcare outcomes can be explained by direct acts of violence causing physical damage and psychological symptomatology. However, violence alone does not completely explain the picture of poor health outcomes that impact upon disease manifestation in many organ systems and particularly in suboptimal responses to standard treatment and management programmes.

In prevalence studies, women exposed to domestic violence have higher rates of both presentation for care and for retreatment, suggesting that they also have poorer rates of cure which cannot be directly explained by exposure to violence (1,2,5). These poor outcomes contribute towards the high cost of care in patients exposed to domestic violence (1,2).

We have previously documented high rates of domestic violence in colposcopy patients (8). One key observation in the study was that women exposed to domestic violence had higher rates of default from their initial attendance for care and high rates of housing instability (8). We hypothesized that default from care could be a causal pathway by which domestic violence impacts upon clinical management and leads to adverse outcomes beyond the direct impact of the violent action.

In the present study, our hypothesis was that women exposed to domestic violence would demonstrate high rates of default from colposcopy services and eventual loss to care despite optimal hospital practices to encourage attendance.

We planned to follow a cohort of women over a three-year period to determine the rate of default and loss to follow up. No previous prospective study has sought to follow women exposed to violence to determine whether adverse outcomes may be explained by care default.

**Materials and Methods**

Institutional ethics committee and informed patient consent were obtained. A prospective cohort study was performed. This cohort has been previously described (8). The patient population consisted of all women booked to attend a colposcopy service at the Sunshine Hospital over a 12-month period. The Sunshine hospital services a population of 500,000 in the western region of Melbourne, Australia. The area has high index of socioeconomic disadvantage (9,10). The hospital is the main provider of women's health services in the region.

Of note, the study specifically included all women, regardless of their primary language. Non-English speaking women and women in whom English was a second language were included by the use of medical interpreters and appropriate information sheets. This was to ensure that the data reflected as far as possible, an 'all comers' approach to the prevalence of domestic violence in the attending population.

All women were provided with an information sheet by a research assistant and following informed consent, were invited to complete a short screening questionnaire.

A short validated screening tool was utilised (11,12). The tool comprises four questions and an additional two questions if the screen is positive. The four screening questions were:

1. Are you ever afraid of your partner?

2. In the last year, has your partner hit, kicked, punched or otherwise hurt you?

3. In the last year, has your partner put you down, humiliated you or tried to control what you can do?

4. In the last year, has your partner threatened to hurt you?

(If domestic violence has been identified in any of the above questions)

5. Would you like help with any of this now?

6. This could be important information for your health care. Would you like us to send a copy of this form to your doctor?

Of note, the process of obtaining informed consent and completion of the questionnaire were only obtained when the woman could be spoken to privately without a partner being present. The interviews were conducted in a room attached to the clinical service room to ensure privacy. All women who made a disclosure of domestic violence were offered referral to ongoing counselling and social support services. The clinic had a safe back exit in case of a threatening disclosure of violence.

The completion of the questionnaire was undertaken by questions being read to the patient in her primary language by the research assistant or via a qualified medical interrupter if required. If the patient gave consent, information in relation to the domestic violence was also disclosed to the woman's attending doctor. However if the women wished this information to remain confidential, this information was not

disclosed. Likewise all women were offered the opportunity to have the information disclosed to the hospital social support services. Of note, in only two cases did the patient decline to have the information transmitted to her doctor and the hospital social support services.

Demographic questionnaires were also read to the patient and addressed age, race, parity, smoking status, housing stability and the Beck Depression Inventory (13). Socioeconomic status was assessed using the postcode methodology validated by the Australian Bureau of Statistics (9,10).

Women were then followed through matching of their hospital unit code through the hospital computerised appointment system (Homer, iSOFT, UK, 2004). A research assistant accessed the appointment system and extracted information on all appointments to colposcopy clinics over the 36 month period of follow-up.

Outcomes of every clinics booking were determined and coded as follows:

1) Patient attended;

2) patient default – first, second and third occasion;

3) hospital default (this occurred if the hospital could not provide the service on the day the patient attended);

4) rebooked at patient request;

5) rebooked at hospital request; and

6) lost to follow up.

Lost to follow up occurred when a patient failed to attend despite receiving three letters and three appointment times as well as a final registered letter, which required a signature at point of delivery to ascertain that it had been delivered and received, along with a final letter being sent to the patient's referring general practitioner.

A power calculation was performed that assumed that 20% of women might screen positive to domestic violence based on previous prevalence studies in other clinical settings (1,2,3,5). Our background rate of default at the institution was 18%. We predicted that rates in women not exposed to domestic violence would fall to 10% and in those exposed, rise to 20%. Applying an alpha error of 5% and power of 80% this generated a required sample of 500 women, of whom 100 would be exposed and 400 not. In order to adjust for recruitment loss, we planned to enrol the initial full calendar year's intake of clinic patients, which was predicted to be approximately 550 women.

Data were presented as number and percentage for discreet variables and as mean and standard deviation for continuous variables that had a normal distribution. Skew data were described as median and interquartile range. Chi square tests with Yates Correction were undertaken to compare discreet data except where the cell size was less than 5 when Fisher Exact test was utilised. Student t-test was used for continuous data. Multivariate linear regression models were performed that included variables associated with default or loss to follow up at p-value of 0.1 or less on univariate analysis. Analyses were undertaken using Minitab 16 (Melbourne University, Victoria, Australia 2011; 10), on a computerised database. A p-value of 0.05 was considered significant.

**Results**

In the three-year study period, a total of 1820 new patients were referred to the clinical service. Of these, 581 presented in the initial year of the study and were approached to participate in the trial. Consent was obtained from 574 of these women (99%). One woman subsequently withdrew whilst completing the questionnaire. In six cases a partner came into the room during the process of completing the questionnaire. In this scenario the research assistant had been advised to stop and change to another

activity as issues of female safety were paramount. In these cases ascertainment of domestic violence was not able to be determined. One other woman gave ambiguous responses to domestic violence questions and her data were also excluded. Thus final outcome data were available on 566 women.

The demographics of the study cohort are summarised in Table 1. The average age of the study population was 33.7 years and the majority were Caucasian. A quarter had never been pregnant and one third were nulliparous. Half were current or ex smokers but only 5% used illicit drugs. A majority of women reported having a current partner. Almost one third of women had co-existing gynaecological symptoms and a third presented with pap smears demonstrating a high-grade abnormality. 17% reported housing instability and one third had a positive Beck depression screen.

Overall 33% of the study cohort reported intimate partner violence within 12 months of the survey. Whilst in 14.5% of the cohort the female reported being the sole recipient of violence, in a further 16.6% of the cohort, the women reported that they had both received and been the perpetrator of violence. In these cases, the majority of women reported that they had responded to verbal, emotional or physical intimidation with violence. In only 1.9% of the cohort did the woman report being the sole perpetrator of violence.

Table 2 summarises the demographic differences between women who defaulted and those who did not. Women who defaulted were significantly more likely to live in unstable housing, have a positive Beck depression screen and report exposure to domestic violence (all $p<0.05$).

Table 3 summarises detailed default rates at the colposcopy clinic during the 36-month period following screening. Women exposed to violence were more likely to default from colposcopy once (26.2% vs 7.4%; $p<0.0001$), twice (11.2% vs 3.2%,

p=0.0001), or thrice (10.7% vs 2.4%, p<0.0001). They were more likely to be lost to follow up (8.0% vs 1.1%, P<0.0001).

In multivariate analysis, variables found to have an association with default from colposcopy on univariate analysis with a p-value of 0.1 or less were included in the model. These variables were: exposure to domestic violence, housing instability and a positive Depression screen. The only variable to retain a significant association with default was exposure to domestic violence (p=0.002).

**Discussion**

The present study indicates that exposure to domestic violence is a significant independent association of recurrent default from colposcopy services. It is also associated with significantly higher rates of loss to follow up. This association persisted in multivariate analysis.

High rates of default from care and loss to follow up are reported widely in the literature in relation to colposcopy and antenatal clinical services (3,4,14-16). Default from care adds considerable cost to the public health system and can result in longer waiting periods for access to care. Despite various interventions that have been trialled in the research literature such as reminder letters, text messages, partial and full booking of lists, default remains a clinical problem (14,17).

Many organisations have developed strategies to reduce default from colposcopy services (14,16,18). However, a large postal survey in the UK found that default was hard to predict using standard demographic variables, although an intention to attend the clinical service three weeks before the appointment date was associated with a higher rate of attendance.

One study reported that smoking and distance to the hospital were associated with higher default rates (14). Of note, this study did not identify domestic violence status or undertake multivariate analysis. In our study, smoking was not a significant association of persistent default in multivariate analysis.

Other organisations have used evidence-based guidelines to develop service protocols designed to improve care outcomes and minimise default (18). These processes have not relied upon close examination of the individual features and social circumstances of the attending patients. Their long term efficacy remains unclear.

The problem may be a general one with default in attending for care, rather than a specific type of care. In a qualitative study in HIV positive patients who were exposed to domestic violence, women reported how domestic violence diminished their ability to obtain regular care (19). The study reported that "Abused women were reluctant to keep appointments if they were afraid of their partners, if they were depressed, feeling ill or 'too worn down', or if they were ashamed of being abused (19)." In a Brazilian study, exposure to domestic violence was associated with self reported difficulty in attending for antenatal care (15).

The strengths of this study are the large sample size, use of a validated screening tool, inclusion of all women including those in whom English was not their first language, and the complete nature of follow up able to be ascertained through linkage with hospital records. The limitations of the study are that it is a single institution study and reflects the high levels of patient acceptability for screening for domestic violence within a western society.

We conclude that exposure to domestic violence may be a barrier to women's access to colposcopy and completion of programs of care. This failure may result in suboptimal healthcare outcomes and further aggravate the damage done to women. It

may be necessary for clinical services to screen for domestic violence and to provide flexibility for these vulnerable women to access care beyond rigid appointment systems. Strategies that direct default strategies in a targeted manner are more likely to be effective than non-directed strategies.

**Acknowledgement**

**Disclosure**

There are no conflicts of interest to disclose.

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Table 1 Demographics of the study cohort

| Variable | N=566 |
|---|---|
| Age in years mean (std deviation) | 33.7 (10.5) |
| Socioeconomic index for disadvantage score mean (std deviation) | 990 (45) |
| Race N (%) | |
| Caucasian | 479 (84.5%) |
| Aboriginal or Torres Strait Islander | 4 (0.7%) |
| Asian | 48 (8.6%) |
| Other | 35 (6.2%) |
| Gravidity N (%) | |
| 0 | 129 (22.7%) |
| 1 | 99 (17.7%) |
| 2 | 131 (23.0%) |
| 3 or more | 207 (36.6%) |
| Parity N (%) | |
| 0 | 199 (35.0%) |
| 1 | 90 (16.1%) |
| 2 | 160 (28.4%) |
| 3 or more | 117 (20.5%) |
| Smoking status N (%) | |
| I have never smoked cigarettes | 266 (47.1%) |
| I used to smoke cigarettes but stopped over a year ago | 44 (7.7%) |
| I used to smoke cigarettes but stopped in the past year | 15 (2.7%) |
| I still smoke cigarettes | 241 (42.5%) |
| Illicit drug use N (%) | |
| Yes | 29 (5.1%) |
| No | 537(94.9%) |
| Other current gynaecological symptoms N (%) | |
| Yes | 189 (33.6%) |
| No | 377 (66.4%) |
| Current partner N(%) | |
| Yes | 436 (77.0%) |
| No | 130 (23.0%) |
| Presenting Pap smear report N (%) | |
| Low grade abnormality | 306 (54.2%) |
| High grade abnormality | 173 (30.5%) |
| Other | 87 (15.3%) |
| Housing stability N (%) | |
| Very stable or semistable | 442 (78.1%) |
| Unstable | 96 (17.0%) |
| Did not answer | 28 (4.9%) |
| Beck Depression Inventory positive screen | |
| Yes | 184 (32.5%) |
| No | 360 (67.5%) |
| Domestic violence | |
| Yes | 187 (33.0%) |
| No | 379 (67.0%) |

Table 2. Demographic differences in women who defaulted compared to those who did not default.

| Variable | Default N=77 | No default N=489 | P-value |
|---|---|---|---|
| Age mean (std dev) | 33.1 (9.9) | 33.9 (10.6) | 0.28 |
| Socioeconomic index for disadvantage score Mean (std dev) | 985 (41) | 992 (46) | 0.46 |
| Race N (%) Caucasian Other | 67 (87.0%) 10 (13.0%) | 412 (84.3%) 77 (15.7%) | 0.53 1.25 (0.60-2.50) |
| Gravidity N (%) 0 1 or more | 19 (24.7%) 58 (75.3%) | 110 (22.5%) 379 (77.5%) | 0.67 1.13 (0.64-1.97) |
| Parity N (%) 0 1 or more | 30 (39.0%) 47 (61.0%) | 169 (34.6%) 320 (65.4%) | 0.45 1.20 (0.73-1.98) |
| Smoker N (%) Never smoked Ex-smoker Current smoker | 35 (45.5%) 5 (6.5%) 37 (48.0%) | 231 (47.2%) 54 (11.0%) 204 (41.7%) | 0.30 0.77 (0.48-1.25) |
| Illicit drug use N (%) Yes No | 7 (9.1%) 70 (90.9%) | 22 (4.5%) 467 (95.5%) | 0.09 2.12 (0.87-5.15) |
| Other gynaecological symptoms N (%) Yes No | 21 (27.3%) 56 (72.7%) | 168 (34.4%) 321 (65.6%) | 0.22 0.72 (0.42-1.22) |
| Have a current partner N (%) Yes No | 54 (70.1%) 23 (29.9%) | 382 (78.1%) 107 (21.9%) | 0.12 0.66 (0.39-1.12) |

| Presenting Pap smear report N (%) | | | |
|---|---|---|---|
| Low grade abnormality | 42 (54.5%) | 263 (53.8%) | 0.11 |
| High grade abnormality | 33 (42.9%) | 140 (27.2%) | 0.66 (0.40-1.09) |
| Other | 2 (2.6%) | 85 (17.4%) | |
| Housing stability (current) N (%) | | | |
| Very stable or semistable | 52 (67.3%) | 390 (79.8%) | 0.0003 |
| Unstable | 25 (32.5%) | 71 (14.5%) | 0.38 (022-0.65) |
| Did not answer (N=28) | 0 (0.0%) | 28 (5.7%) | |
| Positive Beck Depression screen N (%) | | | |
| Yes | 34 (44.2%) | 150 (30.7%) | 0.01 |
| No | 38 (49.4%) | 322 (65.8%) | 1.9 (1.16-3.17) |
| Did not complete | 5 (6.4%) | 17 (3.5%) | |
| Domestic violence N (%) | | | |
| Yes | 49 (63.6%) | 138 (28.2%) | <0.0001 |
| No | 28 (36.4%) | 351 (71.8%) | 4.45 (2.69-7.37) |

Table 3. Default rates from colposcopy clinics.

| Variable | Domestic violence N=187 | No domestic violence N=379 | P-value |
|---|---|---|---|
| Single episode of default Yes No | 49 (26.2%) 138 (73.8%) | 28 (7.4%) 351 (92.6%) | P<0.0001 RR 2.25 (1.81-2.81) |
| Two episodes of default Yes No | 21 (11.2%) 166 (88.8%) | 12 (3.2%) 367 (96.8%) | P=0.0001 RR 2.04 (1.53-2.72) |
| Three or more episodes of default Yes No | 20 (10.7%) 167 (89.3%) | 9 (2.4%) 370 (97.6%) | P<0.0001 RR 2.22 (1.68-2.92) |
| Lost to follow up care Yes No | 15 (8.0%) 172 (92.0%) | 4 (1.1%) 375 (98.9%) | P<0.0001 RR 2.51 (1.93-3.27) |
| Appointments rebooked by hospital Yes No | 9 (4.8%) 178 (95.2%) | 21 (5.5%) 358 (94.5%) | P=0.716 RR 0.90 (0.52-1.58) |
| Appointments rebooked by patient Yes No | 19 (10.2%) 168 (89.8%) | 25 (6.6%) 354 (93.4%) | P=0.136 RR 1.34 (0.94-1.93) |