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Sexual assault and general body injuries: A detailed cross-sectional Australian study of 1163 women

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ABSTRACT

Objectives: To describe the frequency and severity of general body injury in women alleging recent sexual assault and then identify demographic and assault characteristics associated with injury severity.
Design: Cross-sectional study.
Setting: Sexual Assault Resource Centre (SARC), Western Australia.
Participants: Total of 1163 women attending SARC from Jan-2009 to Mar-2015.
Methods: Women underwent a standardised medical examination and data collection by forensically trained doctors. Multivariate ordinal logistic regression analyses were performed. An algorithm was used to classify general body injuries as mild, moderate or severe.
Results: General body injury was observed in 71% of women; 52%, 17% and 2% were classified as having respectively, mild, moderate and severe injuries. Moderate or severe injury was observed in 30.4% of women assaulted by intimate partners, 16.4% of women assaulted by strangers and 14.9% of women assaulted by friends/acquaintances. In regression analysis, an interaction between mental illness and assailant type existed after adjusting for age, intellectual disability, time-to-examination, number of assailants and location. Mental illness was an independent predictor for lower injury severity (adjusted odds ratio = 0.5, 95% CI 0.3, 0.9) in women assaulted by strangers and higher injury severity in women assaulted by a friend/acquaintance (adjusted odds ratio = 2.4, 95% CI 1.6, 3.6). While women assaulted by intimate partners had more frequent moderate-to-severe injuries than other women their current mental illness status was not associated with risk of injury severity.
Conclusion: This study highlights the increased injury severity in women assaulted by intimate partners. The risk of moderate/severe injury for women with mental illness assaulted by their acquaintances was unexpected and requires further investigation.

1. Introduction

Prevalence data for sexual assault in Australia in 2012 [1] estimated that 17% of all women aged 18 years and over and 4% of all men aged 18 years and over, had experienced sexual assault since the age of 15. There are no large cohort Australian studies which have examined either general body injury prevalence or general body injury severity following allegations of recent sexual assault.

Earlier studies conducted in Australia [2], United States [3], Sweden [4], United Kingdom [5,6], Ireland [7], France [8], Serbia [9] and New Zealand [10] describe the frequency of general body injury and associated factors in females with a history of recent sexual assault. The frequency of non-genital injury reported in the literature ranges from 39% [8] to 82% [5]. The presence of general body injuries has been associated with higher rates of laying charges and prosecution of sexual assault [11–16]. In a large South African study [17] both general body and genital injury were strongly associated with conviction.

Only two studies address the severity of injuries sustained by women reporting sexual assault [9,18]. How injury severity varies according to the patient-assailant relationship or other potential risk factors is unknown. Women who are sexually assaulted by

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their intimate partner are at greater risk of non-fatal strangulation [19]. Whether women sexually assaulted by their intimate partner are also at greater risk of more severe injuries than women assaulted by other types of assailants, such as strangers or friends, remains to be investigated. In recognition of this, the Sexual Assault Resource Centre (SARC) designed a Medical Services Clinical Information System (SARC-MSCIS) [20]. SARC is the sole sexual assault referral centre for police and other emergency providers in Perth, the capital of Western Australia.

The aim of the study was to describe the frequency and severity of general body injury in a large cohort of female sexual assault presentations and to identify both demographic and assault characteristics associated with increased risk of injury severity.

2. Methods

2.1. Definitions

Any physical assault included a history of blunt force assault, non-fatal strangulation, being bitten and reported weapon use.

Assailant types were categorized as stranger, intimate partner, friend/acquaintance, accidental acquaintance (known <24 h), unknown (no memory), and others (e.g. employer/colleague, carers, relatives, taxi-driver). Intimate partner included current and ex-partners (including husbands, de factos and boyfriends).

Blunt force assault included a history of being punched, kicked, slapped, dragged, stomped, hit, pushed, knocked, beaten, and pulled hair.

Current mental illness was based on the patient's self-reported history and included psychotic (e.g. schizophrenia, bipolar disorder) and non-psychotic (e.g. anxiety, depression) disorders.

General body (non-genitoanal) *injury* included injuries found on the head (scalp/hair, eyes, ears, facial), mouth (lips, teeth and oral cavity), neck, torso (chest, breasts, upper back, abdomen, lower back and buttocks), arms (inner upper arms, remainder of arms, hands, and fingernails), and legs (inner thighs, remainder of thighs, lower legs, feet, knees).

Indecent assault was a non-consensual sexual act in the absence of completed or attempted penetration.

Injury types included bruises, abrasions, lacerations, incised wounds, penetrating (stab) wounds and burns. Yellow bruises detected within 18 h of the assault time were considered to predate the assault and excluded. Redness and/or tenderness were not included due to their non-specific nature. Injuries considered by the forensic clinician to be self-inflicted were excluded. Injuries due to firearms were absent in this cohort.

2.2. Injury severity

A SARC derived algorithm was used to allocate the women according to injury severity: (i) no injury, (ii) mild injury which had no impact on physical function and did not require any medical treatment (e.g. bruises/abrasions ≤3 cm, laceration <2 cm), (iii) moderate injury which impacted on function and/or required treatment/hospital referral (e.g. incisions, burns, laceration >2 cm, signs of non-fatal strangulation, 10 or more bruises >3 cm), or (iv) severe injury (e.g. admitted to intensive care or high dependency unit, stab wounds, fracture, required treatment for non-fatal strangulation). Details on the algorithm use to classify injury severity are given in Table 3.

Non-fatal strangulation included manual, ligature and choke-hold methods of neck pressure.

Sexual assault included non-consensual completed or attempted penetration of the patient's vagina or anus by a penis, mouth, finger or other objects or penetration of the patient's mouth by a penis. The nature of the penetration was classified as unknown if the patient suspected sexual assault but had no or incomplete recollection of the incident.

2.3. Selection of study participants

Study participants included females aged 13 years and older referred to the Sexual Assault Resource Centre (SARC) in Perth, Western Australia for an emergency consultation between 1 January 2009 and 31 March 2015 following alleged recent sexual assault. Excluded from the study were patients who (i) did not give consent for research, (ii) were indecently assaulted, (iii) did not know either the date of the sexual assault or could not estimate time since assault, (iv) referred to SARC for emergency consultation more than 10 days after the sexual assault, (v) did not consent for general body physical examination, (vi) admitted that the report was fallacious and/or the alleged assault was considered to be a false report by the police or the forensic clinician.

Children who allege sexual abuse from a family member, pre-pubertal children, children with late disclosure of the abuse and those for whom child protection agencies are involved, are examined by paediatricians from the children's hospital and not referred to SARC. As a result, these cases did not form part of the study population.

2.4. Forensic examination and data collection

Forensically trained doctors from SARC conducted physical examinations using a standard sexual assault examination protocol, as outlined in the SARC Medical and Forensic Manual, Western Australia. This includes physical examination of the entire body (head to toe, front and back), with measurement and documentation of any injuries and findings on standardized body diagrams in the SARC Forensic Record. Patient and/or guardian informed consent was obtained for use of de-identified data for research. The attending clinician entered history and examination data into the SARC-MSCIS. Missing or inconsistent database data was queried and amended where possible following clinician chart review.

2.5. Statistical analysis

Descriptive statistics were used to describe characteristics of the women and the sexual assault and summarized as means ± standard deviations for continuous data and as percentages for categorical data. Contingency tables and chi-square tests were used to test associations between each patient/assault characteristic and injury severity. Purposeful selection of covariates was used to assess predictive factors for injury severity in patients to construct multivariate ordinal logistic regression models. All initial models included covariates that had a p-value <0.25 in bivariate analyses along with factors of known clinical importance; model covariates with p-values of 0.15 or less were retained in the model. The purposeful selection model for the covariates and the modelling processes were described by Hosmer et al. [21]. Adjusted odds ratios and 95% confidence intervals were estimated. Plausible interactions significant at $p < 0.01$ were retained. The Brant test was used to test that the parallel regression assumption was not violated (p-value level 0.01). Two multivariate models, one without (Model 1) and one with (Model 2) adjustment for types of physical assault (e.g. blunt force, weapon) were used to identify factors independently associated with injury severity. Adjusted predictions at representative values were estimated to show how injury risk varied by varying the predictor characteristics of the women. All statistical analyses were performed using Stata version 14.1 (College Station, TX, USA).