

Genital injuries following sexual assault of women with and without prior sexual intercourse experience

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Abstract

Background: The literature on sexual assault has not directly addressed the question of genital injuries in women without prior sexual intercourse experience. Given the paucity of research and the current importance of physical evidence in the criminal justice system, this study was designed to document the type and site of genital injuries from sexual assault in women without and with prior sexual intercourse experience.

Methods: The charts were reviewed of 132 women who had been sexually assaulted and had sought medical treatment at the Sexual Assault Care Centre (SACC), Women's College Hospital, Toronto, within 10 days after the assault. Half (66) of the women reported that, at the time of the assault, they had no prior sexual intercourse experience. The Sexual Assault Evidence Kit in each patient's file was reviewed to ascertain the type and location of genital injuries. Types of injuries were classified into 3 categories (nonperforating soft-tissue injuries, lacerations or current bleeding) and locations into 6 categories (labia majora and minora, posterior fourchette and introitus, hymen, vagina, cervix, and anus).

Results: Significantly more women without than with prior sexual intercourse experience had visible genital injuries (65.2% v. 25.8%, $p < 0.01$). However, of the women without prior experience, only 9.1% had hymenal perforation. Analyses of the data for only women with genital injuries indicated no difference between those without and those with prior sexual intercourse experience in the overall mean number of injured sites (1.65 and 1.47 respectively) or in the mean number of sites with nonperforating soft-tissue injuries (0.349 and 0.706), lacerations (0.953 and 0.471) and bleeding (0.279 and 0.294).

Interpretation: The results suggest that genital injuries are more common in women without prior sexual intercourse experience but that substantial proportions of all women, regardless of their prior sexual experience at the time of assault, will not have visible genital injuries. Emergency department staff and members of the criminal justice system need to be aware of the variable presentation of genital trauma related to sexual assault in women with and without prior sexual intercourse experience.

Résumé

Contexte : Les articles de recherche sur les agressions sexuelles n'ont pas traité directement de la question des lésions aux organes génitaux subies par les femmes qui n'avaient jamais eu de relations sexuelles avant l'agression. Étant donné la rareté des recherches et l'importance actuelle des preuves physiques dans le système de justice criminelle, cette étude visait à documenter le type et le site des lésions aux organes génitaux causées par une agression sexuelle chez les femmes qui n'avaient jamais eu de relations sexuelles avant l'agression et chez celles qui en avaient eu.

Méthodes : On a étudié les dossiers de 132 femmes qui avaient été victimes d'une agression sexuelle et avaient demandé des traitements médicaux au Centre de traitement des agressions sexuelles du Women's College Hospital de Toronto dans les dix jours suivant l'agression. La moitié (66) des victimes ont déclaré qu'elles n'avaient jamais eu de relations sexuelles avant l'agression. On a exa-



Evidence

Études

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miné la trousse de preuve d'agression sexuelle dans le dossier de chaque patiente pour déterminer le type et le lieu des lésions subies aux organes génitaux. Les lésions ont été classées en trois catégories (lésions des tissus mous sans perforation, lacérations ou saignement continu) et les endroits, en six catégories (grandes lèvres et petites lèvres, fourchette postérieure et ostium vaginae, hymen, vagin, col et anus).

Résultats : On a constaté la présence de lésions visibles aux organes génitaux chez beaucoup plus de femmes qui n'avaient jamais eu de relations sexuelles avant l'agression que chez celles qui en avaient eu (65,2 % c. 25,8 %, $p < 0,01$). Cependant, parmi les femmes qui n'avaient jamais eu de relations sexuelles avant l'agression, 9,1 % seulement avaient subi une perforation de l'hymen. Les analyses des données seulement sur les femmes victimes de lésions aux organes génitaux n'ont révélé aucune différence entre celles qui n'avaient jamais eu de relations sexuelles avant l'agression et celles qui en avaient eu quant au nombre moyen global d'endroits blessés (1,65 et 1,47 respectivement) ou au nombre moyen d'endroits où elles avaient subi des lésions des tissus mous sans perforation (0,349 et 0,706), des lacérations (0,953 et 0,471) et saigné (0,279 et 0,294).

Interprétation : Les résultats indiquent que les lésions aux organes génitaux sont plus fréquentes chez les femmes qui n'avaient jamais eu de relations sexuelles avant l'agression mais que beaucoup de femmes, peu importe leur vécu sexuel antérieur au moment de l'agression, n'auront pas de lésions visibles aux organes génitaux. Les membres du personnel des services d'urgence et du système de justice criminelle doivent connaître les aspects variables des traumatismes génitaux découlant d'une agression sexuelle subie par les femmes qui avaient eu des relations sexuelles et celles qui n'en avaient jamais eu avant l'agression.

Despite reports confirming that a lack of physical evidence (including genital injuries) in sexual assault cases does not necessarily indicate consent to sexual activity or the absence of such, police and prosecutors continue to emphasize the importance of physical evidence in investigations and prosecutions.¹⁻⁵ Researchers and clinicians have thus shown interest in understanding potential objective indicators of consenting sexual activity⁶⁻¹⁰ and sexual assault.^{3-4,9,11-16}

Studies of genital injuries arising from sexual activity have produced mixed findings.^{7,17-21} Genital injuries from both consenting and nonconsenting sexual intercourse have been found to range from rapidly healing micro lacérations to major vault and mucosal tears.^{7-10,22} Some researchers have reported rates of genital trauma of only 5% to 28% among sexual assault cases;^{7,14,19,21-26} others have suggested that rates are higher because micro injuries can be detected using staining and magnification procedures.^{6,12,27} Clinicians have noted that various characteristics of the victim (e.g., menopausal status) may also affect the rate of genital trauma.^{8,19} Whether a person having consensual or nonconsensual sex will suffer genital injuries, and under what conditions, remains difficult to predict.

The literature to date has not addressed genital injuries in sexually assaulted women who had no prior sexual intercourse experience at the time of the assault. Common knowledge and findings from studies of first consensual intercourse predict that this population would suffer more se-

rious genital injuries during assaults involving penetration than would women who had prior sexual intercourse experience.^{6,7,10,22} However, clinical evidence and the literature on indicate that not all cases of penetration result in perforation of the hymen or subsequent visible genital injuries.^{3,21}

Because of the paucity of data in this area, we designed this retrospective chart review to determine the types and location of genital injuries in women who survived sexual assault involving penetration. Those without prior sexual intercourse experience and those with prior experience were compared in order to determine whether prior intercourse status differentially determines genital injury.

Methods

This study was approved by an institutional review board at the Women's College Hospital, Toronto.

Chart review

A subset of charts for women who presented for medical treatment after sexual assault to the Sexual Assault Care Centre (SACC) at Women's College Hospital between 1984 and 1995 was randomly selected and reviewed chronologically for potential inclusion. The subset of charts was selected from among 250 recorded on average in each study year so that we could include the greatest variety of medical examiners. Charts were excluded if



documentation indicated no completed vaginal or anal penetration by a penis or foreign body; the type of injuries, injury location or the woman's sexual history was unknown; the woman declined to undergo a physical examination or to allow the physician to complete the Sexual Assault Evidence Kit (the main source of our data); or the assault occurred more than 10 days before presentation to the centre. Of the 132 charts selected, 66 were for women who reported no prior history of sexual intercourse and 66 were for those who did report sexual intercourse experience before the assault.

The sexual history and physical injury information documented in the charts are gathered by SACC physicians specially trained to assess sexual assault cases, to collect forensic evidence and to provide care for assault victims. The physicians follow standard documentation procedures. The Sexual Assault Evidence Kit is a standardized evidence collection procedure in which the examining physician systematically records the victim's account of the assault, sexual activity the week before the assault and activities after the assault (e.g., whether the victim showered, bathed, defecated, voided or used spermicide). Physical evidence as well as clothing and foreign materials are collected. A complete physical and genital examination is performed, and injuries are documented in both standardized diagrams and in writing. This data collection and examination takes about an hour; however, the time varies depending on the case complexity, the extent of injuries and the number of procedures to which the victim consents.

Data analysis

The physical injury information recorded in the evidence kits was compiled from the charts and coded according to investigator-defined categories. Types of injuries were classified into 3 mutually exclusive categories: nonperforating soft-tissue injuries (bruises, bites, redness, swelling); lacerations (tears, cuts, abrasions); and current bleeding (determined from history taking or evident on examination; healed hymenal perforations were noted in this category). Locations of injuries were coded for 6 examined genital areas: labia majora and minora; posterior fourchette and introitus; hymen; vagina; cervix; and anus. If more than one injury was noted at a given site, the most serious injury was coded. None of the injuries in the sample was ascertained with staining methods or colposcopy. Colposcopic examination was not conducted during the study period.

Data analysis was conducted using SPSS software (version 5.00, for Unix-based systems; SPSS Inc., Chicago). The χ^2 test was used to determine significant differences in the number of women with genital injuries between the 2 study groups (those without and those with prior sexual

intercourse experience). Separate between-group analyses of variance (ANOVAs) were then conducted to determine differences between the groups in age, number of injured genital sites, number of sites with nonperforating soft-tissue injuries, number of sites with lacerations and number of sites with bleeding. Finally, separate between-group ANOVAs were conducted using only data for women with genital trauma, to determine whether the 2 groups differed significantly in the same continuous variables.

Results

The 2 groups did not differ significantly in age: those without prior sexual intercourse experience were 15 to 64 years old (mean 21.58) and those with prior intercourse experience were 15 to 56 years old (mean 20.77).

The characteristics of the assaults and injuries are summarized in Table 1. Most of the women in each group were assaulted vaginally. Over half of those without prior intercourse experience had genital trauma; significantly fewer women with prior experience had genital trauma (25.8% v. 65.2%, $p < 0.01$). However, this meant that as many as 34.8% of the women without and 74.2% of those with prior sexual intercourse experience had no visible genital trauma.

Initial injury analyses were conducted using data for the full sample. The women without prior sexual intercourse experience had significantly more sites of genital injury than those with prior experience (mean number of injured sites 1.08 v. 0.38, $p < 0.001$). The mean numbers (and standard deviations) of genital injuries by type of injury are given in Table 1. The 2 groups of women did not differ significantly in the mean number of sites with nonperforating soft-tissue injuries ($p = 0.607$) or of sites with bleeding ($p = 0.162$). However, the mean number of sites with lacerations was significantly higher in the group without prior sexual intercourse experience ($p < 0.001$). Only 9.1% of the women without prior experience had notable hymenal perforation.

In the analyses of the data for women with genital trauma (43 without and 17 with prior sexual intercourse experience), the 2 groups did not differ significantly in the overall mean number of injured sites (1.65 and 1.47 respectively, $p = 0.439$) or in the mean number of sites with nonperforating soft-tissue injuries (0.349 and 0.706, $p = 0.064$), lacerations (0.953 and 0.471, $p = 0.058$) or bleeding (0.279 and 0.294, $p = 0.933$).

In both groups the most common site of injury was the posterior fourchette and introitus; the next most common site was the labia majora and minora. Lacerations and nonperforating soft-tissue injuries were the most common type in both groups. Among the women without prior intercourse experience, lacerations to the posterior four-



chette and introitus and to the hymen were most common. Equal numbers of women with prior intercourse experience had nonperforating soft-tissue injuries to the posterior fourchette and introitus, the labia and the cervix.

Interpretation

Our study provides data regarding the extent and type of genital injuries from sexual assault in women with and without prior sexual intercourse experience. In the sample studied, significantly more women without than with prior experience had visible genital trauma, a finding that supports conclusions from the literature on trauma injuries related to consensual intercourse.^{6,7,10} Among the women with prior experience, the sites of genital injury corresponded to those noted in earlier reports.^{7,8} Although the women in our study without prior intercourse experience were more likely overall than those with such experience to have genital trauma, when only those with genital injuries were included in the analysis there was no significant difference between the 2 groups in the number of injured sites or in the number of nonperforating soft-tissue injuries, lacerations or bleeding injury.

Overall 45% of the women suffered genital trauma during their assaults, a much higher rate than that reported previously.^{7,15,16,20,23-25,28} Because we included women who not only chose to present for medical treatment after their assault but also agreed to subsequent forensic evidence collection, the higher injury rate in our study may have been one of several factors influencing the women's decision to seek help in this manner. The rate of reporting sexual assaults is low; therefore, a limitation of our

study may be that it reflects more sexual assault-related injuries than actually occur in the general population of female survivors of sexual assault.

Another possible limitation is a reporting bias between women without and those with prior sexual intercourse experience. Given the nature of the crime and the procedures for collecting forensic evidence, it is unknown what effect prior intercourse experience may have on the decision to seek medical help at a sexual assault care centre.

We found that just over 34% of the women without and 74% of those with prior intercourse experience had no visible genital injuries after their assaults. As well, only 9.1% of those without prior experience had noticeable hymenal perforations. These findings support prior research and clinical evidence suggesting that a significant proportion of rape survivors will not have visible genital injuries. These findings may also contribute to research suggesting that observed genital injuries have little bearing on the authenticity of survivors' accounts²⁻⁵ and may raise questions about the usefulness of injury data for investigation and prosecution of sexual assault cases.

Many variables (e.g., hormonal status, lubrication, position and assailant characteristics)³⁰ are not fully understood in how they might influence sexual assault-related physical trauma and therefore need to be investigated in ongoing research. Although in our study the women with genital injuries, regardless of their prior sexual intercourse experience, did not differ in the overall number of injured genital sites, the extent and seriousness of the injuries is unknown and merits further study. As well, because the evidence for our study had been collected without the use of colposcopy, it is unknown whether the incidence of mi-

Table 1: Details of sexual assault cases involving women without and with prior sexual intercourse experience

Assault characteristic	Women without prior intercourse experience <i>n</i> = 66	Women with prior intercourse experience <i>n</i> = 66	Total <i>n</i> = 132
Type of assault, no. (and %) of women			
Vaginal	58 (87.9)	60 (90.9)	118 (89.4)
Anal	1 (1.5)	0 (0.0)	1 (0.1)
Vaginal and anal	7 (10.6)	6 (9.1)	13 (9.8)
Visible genital trauma,* no. (and %) of women			
Yes	43 (65.2)	17 (25.8)	60 (45.5)
No	23 (34.8)	49 (74.2)	72 (54.5)
Mean no. of injured sites	1.08	0.38	0.73
Type of genital injury, mean no. (and SD)			
Nonperforating soft-tissue injury	0.23 (0.46)	0.18 (0.55)	0.20 (0.51)
Laceration†	0.62 (0.86)	0.12 (0.45)	0.37 (0.72)
Bleeding	0.18 (0.52)	0.08 (0.32)	0.13 (0.44)

Note: Injury type was coded only by site. SD = standard deviation.

**p* < 0.01.

†*p* < 0.001.



cro injuries differed between the 2 groups. Further research on micro trauma in women who have been sexually assaulted has important implications for the legal system and for standardized forensic collection procedures.

Overall, our results challenge some assumptions regarding prior sexual experience and genital trauma from sexual assault. These assumptions need to be reconsidered by both hospital emergency department staff and members of the criminal justice system.

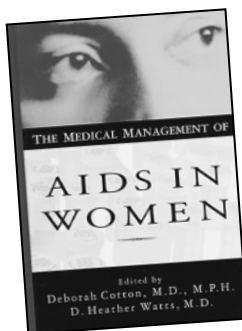
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