Female genital injuries resulting from consensual and non-consensual vaginal intercourse

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ABSTRACT

Objectives: The purpose of this study was to compare the incidence of genital injury following penile–vaginal penetration with and without consent.
Design: This study compared observations of genital injuries from two cohorts.
Setting: Participants were drawn from St. Mary's Sexual Assault Referral Centre and a general practice surgery in Manchester, and a general practice surgery in Buckinghamshire.
Participants: Two cohorts were recruited: a retrospective cohort of 500 complainants referred to a specialist Sexual Assault Referral Centre (the Cases) and 68 women recruited at the time of their routine cervical smear test who had recently had sexual intercourse (the Comparison group).
Main outcome measures: Presence of genital injuries.
Results: 22.8% ($n = 500$, 95% CI 19.2–26.7) of adult complainants of penile–vaginal rape by a single assailant sustained an injury to the genitalia that was visible within 48 h of the incident. This was approximately three times more than the 5.9% ($n = 68$, 95% CI 1.6–14.4) of women who sustained a genital injury during consensual sex. This was a statistically significant difference ($a < 0.05$, $p = 0.0007$). Factors such as hormonal status, position during intercourse, criminal justice outcome, relationship to assailant, and the locations, sizes and types of injuries were also considered but the only factor associated with injury was the relationship with the complainant, with an increased risk of injury if the assailant was known to the complainant ($p = 0.019$).
Conclusions: Most complainants of rape ($n = 500$, 77%, 95% CI 73–81%) will not sustain any genital injury, although women are three times more likely to sustain a genital injury from an assault than consensual intercourse.

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1. Introduction

Lincoln [1] asserts in her review of the literature that sexual taboos have restricted the accumulation of knowledge concerning sexuality and genitalia, particularly regarding the female. This restriction, she contends, persists and past misconceptions are still being corrected regarding the normal anatomy of the genitalia. Bowyer and Dalton [2], for example, claimed that the paucity of research informing medical evidence on injuries from rape exacerbates the under-reporting of rape, the low numbers of cases that reach court, and those that then end in a conviction: 5.6% of cases reported to the police in England and Wales [3]. The literature also suffers from the variety of examination/visualisation techniques, participant inclusion/exclusion criteria and even definitions of injury practiced in the different studies. This makes it difficult to reliably compare findings between studies and in particular, the lack of studies that have attempted to compare injury rates resulting from consensual with non-consensual intercourse further emphasises that difficulty.

Much of the driving force of current research around genital injury does not come from a medical-treatment interest but from a medico-legal need to provide corroborating evidence in prosecutions for sexual assault. The presence of injuries may be seen as proof of no consent and their absence as the proof of consent given,

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but the evidence to support or refute such reasoning has been scant. This study sought to find if penile–vaginal rape causes more objective genital injury than consensual intercourse.

1.1. Genital injuries due to consensual sexual intercourse

Consensual intercourse may result in injury, indeed some sexual practices may incorporate it, but injury during consensual intercourse is very uncommon. Geist [4] proposed that vaginal lacerations during consensual intercourse are more likely in post-menopausal women, as well as those who have borne children vaginally, had surgery, or radiation therapy because of the weakening to tissue such events cause. Geist notes that severe injuries are generally found high in the vault, whereas lesser lacerations are generally found at the posterior fourchette.

Lauber and Souma [5] also reported a marked difference in the injuries sustained by consensual and non-consensual sex. They conducted a comparison of 22 recently assaulted women with 22 others who had had consenting penile–vaginal intercourse. Nine (41%) of the assaulted women had injuries, whereas only one (5%) of the women that had consented to sex sustained an injury. Jones et al. [6] reviewed photographs taken during colposcopy, often using toludine dye, and included subjective injuries such as swelling. They found a statistically non-significant higher rate of anogenital injury in adolescents (13–17 years) following non-consensual intercourse than in those following consensual intercourse (85% compared to 73%), with the exception of posterior fourchette lacerations from consensual intercourse with an older partner.

The study most cited on this issue is from Slaughter et al. [7], who found that genital injury occurred significantly more frequently as a result of non-consensual vaginal intercourse (rape) than it did from consensual intercourse. Notably 48 of the 75 in the 'consensual' group had originally been examined following an allegation of assault, later withdrawing the allegation and admitting to consensual intercourse. A further six were minors examined by the suspected abuse response team (SART) following consensual but illegal intercourse (the age of consent in California being 18 years), and two were SART clients re-examined in routine post-assault follow-ups. The remaining 19 had responded to an advert inviting participation. The issue of consent for 54 of the 'consensual' participants (72% of the control group) is therefore debatable.

1.2. Female genital injuries due to non-consensual sexual intercourse

The incidence of genital injury following rape varies greatly between different studies using a variety of methodologies. For example, results from using visualisation only, those using a staining dye, and those using colposcopy vary. In her 2007 review, Sommers [8] found that injuries seen in such studies were typically within the ranges of up to 40%, between 40 and 58%, and up to 87% respectively. Sugar et al. [9], reported 20% of 759 women aged 15–87 years examined following a complaint of sexual assault had at least one injury in the anogenital area. This study identified genital injury by gross visualisation only and recorded only objective injuries, as is the case in the present study. They also found that fewer injuries were noted in participants examined after 24 h since the assault rather than before 24 h. Palmer et al. [10], similarly found 22% of 153 women in their Australian study sustained an injury to the genitalia, although 14% of that sample also included assaults other than penile–vaginal penetration.

Yet others found less than 10% [11], 15% [4], and more than 20% [12], whilst the Slaughter et al. [7] study reported nearly 70% of assaulted participants acquiring genital injuries. It should be noted that as well as using colposcopy, Slaughter et al. [7] also included subjective injuries such as swelling and redness, rather than restricting to objective injuries such as laceration and bruising. The variability within the literature on the number of participants, their age and other demographic characteristics, and the different sets of circumstances around each incident highlights the lack of a single 'type' of rape complainant or a single set of consequent injuries. Bowyer and Dalton [2] found that a minority of vaginal rape survivors in their study had a genital injury (22/83; 26%) leading them to conclude, despite the absence of a consensual Comparison group, that "absence of genital injury does not exclude [vaginal] rape" (p. 617 [2]).

1.2.1. Hormonal status

Ramin et al. [13], explored genital injury and the hormonal status of the sexual assault complainant in their well conducted study of 129 post-menopausal and 129 pre-menopausal women who had been assaulted, then examined, each at the same venue and using the same procedure. They found that post-menopausal women were more likely than their pre-menopausal counterparts to receive genital injuries following sexual assault. Post-menopausal women received significantly more abrasions, oedema and lacerations to the genitalia than the pre-menopausal participants. This was attributed to "atrophy of connective tissue, loss of soft-tissue elasticity, and atrophy of vaginal epithelium" (p. 863 [13]). Conversely, the younger group of participants received more extra-genital injuries. Ramin et al. [13], see their results as repeating those of Cartwright and Moore [14], and concur with Geist [4] that genital injuries occur most to the very young and older females. There were circumstantial differences that could not be addressed, such as the extent to which participants had resisted. Also, the younger participants were more often black, whilst the older were more often white, and the younger participants had also consumed more alcohol. Ramin et al. [13], also suggest that the motives for raping younger and older women differ. Sugar et al. [8], also found that participants under 20 years of age or over 49 sustained more anogenital injuries than those between those ages. However, Sommers et al. [15], found no relationship between menopausal status and increased risk of injury.

1.2.2. Relationship to assailant

Slaughter et al. [7], found that those assaulted by a partner or ex-partner received significantly fewer injuries than those without such a relationship with the assailant, although such findings may reflect considerable cultural factors that may vary greatly between and within countries, ethnic groups, and degrees of sexual experience. Jones et al. [16], found a statistically significant higher rate of anogenital injuries in complainants of stranger rapes than in those assaulted by a person known to them (77% compared to 71%). However, Field and Bienen [17] argue that the opposite pertains, and that injuries can be greater in an assault within a sexual relationship.

2. Methods

2.1. Aims, endpoints and hypothesis

The overall objective of this study was to obtain reliable normative data concerning the prevalence of genital injuries resulting from consenting and non-consenting vaginal intercourse. Two cohorts were recruited: a retrospective cohort of complainants referred to a specialist Sexual Assault Referral Centre (the Cases) and women recruited at the time of their routine cervical smear test (the Comparison group).

2.2. Participants

2.2.1. The assault (Case) group

This group consisted of a consecutive series of 500 cases drawn retrospectively from the records at St. Mary's Sexual Assault Referral Centre in Manchester, UK. A

cohort was selected in December 2002 working back from 1/1/2001 to 14/1/1997 so that the eventual legal outcomes would be more likely to be known for most complainants.

The inclusion criteria were:

- Female aged 18 years or over (due to stipulations of the research ethics committee).
- Allegation of penile–vaginal rape by one assailant.
- Full forensic medical examination within 48 h of assault.

Routinely collected data were extracted and completely anonymised with no linkage to the original data being retained.

2.2.2. The non-assault (Comparison) group

Control participants were recruited prospectively from women due for routine cervical smear test (unrelated to any specific suspected pathology) at one general practice surgery in South Manchester and one in South Buckinghamshire, UK, areas with contrasting socioeconomic profiles. The examining general practitioners were qualified and experienced in forensic medicine and in the examination of sexual assault complainants. Patients were invited to participate by a letter accompanying their cervical smear test reminder. Only those who had intercourse in the 48 h prior to the test were recruited. The voluntary nature of participation was made clear and test uptake monitored to ensure that these invitations did not dissuade women from attending for their cervical smear tests. Full written consent was obtained from all participants. Examinations took place between 5/2/03 and 29/3/05.

2.2.3. Sample size considerations

The numbers of participants in the study were guided by the need to obtain reasonably accurate estimates of the prevalence of injuries in these two groups, to attain sufficient statistical power to test the hypothesis of a difference between the two main groups and investigate subgroup differences within the Case group. The primary endpoint was the presence or absence of injury. 250 women per group would have given estimates of the prevalence in cases (based on 20% prevalence) with 95% confidence interval width of $\pm 5\%$ and of $\pm 4\%$ (based on 10% prevalence) in the control group. A sample size of twice this number was specified for the Cases to give greater potential for subgroup analysis. However, it was only possible to recruit 68 participants to the Comparison group within the time allowed by the ethics committee, which included an extension.

2.3. Data collection and analysis

For Cases data was extracted from the client notes made by the examining Forensic Physician. Those notes are compiled for use as evidence in criminal proceedings. This included: circumstantial information relating to the assault, such as relationship to assailant and demographic details; the nature and location of genital injuries; the source of the referral, and the progress of the case through the criminal justice system. The circumstantial information included the demographic details of age, ethnic origin, menopausal status, and number of children delivered vaginally. Comparison group data included the nature and location of genital injuries, age and ethnicity. For the Comparison group, an examination of a similar standard was conducted by a doctor with general and forensic practitioner experience.

The genital sites concerned were the labia, hymen, posterior fourchette, vagina and cervix. The categories of injuries were bruises (contusions), abrasions and lacerations. Subjective injury types such as redness, swelling, and tenderness were not included in this study. Participants were examined in the modified lithotomy position, with magnification light source (wall mounted circular magnifying glass with incorporated lamp surround). Neither colposcopy, dye nor photography were used. Measurements of more easily accessible injuries were made with a rule designed for injury measurement placed against the injury. Internal injuries were measured against a known dimension, for example, little finger nail width.

Population frequencies and their associated 'exact' 95% confidence intervals were estimated for the data as a whole and for subgroups of interest. Comparisons between the groups and between pairs of subgroups of Cases were performed using Fisher's Exact Tests. Binomial regression models were used to make global tests of heterogeneity between multiple subgroups, and similar models with linear covariates to test for trends in ordered categories. The analyses were repeated excluding post-menopausal participants but as the results did not differ substantively in general from those on the whole sample these are not presented here.

3. Results

3.1. Composition of the participant groups

A total of 500 cases and 68 Comparison participants were recruited. In both groups the 30–45 years age band was the largest, and White was the ethnic origin of most participants. Details of the characteristics of the participant groups are shown in Table 1. The Comparison groups are older and more likely to have had children. Assault complainants were generally examined earlier after assault than the Comparison group after intercourse.

Table 2 summarises the nature of the assaults: 25% of assailants were strangers to the complainant; 34% acquaintances, and 35% partners, former partners or friends. Table 3 lists the outcomes (where known) of the UK criminal justice system for these cases, with unknowns removed. The missing information was due to the police not returning or being unable to identify outcomes of cases. Only 22% of the 335 cases for which outcomes were known reached a criminal trial. A conviction was secured in only 10% of the 335 cases for which outcomes were known.

3.2. Presence and number of injuries

Nearly a quarter (114/500, 23%) of all cases alleging penile–vaginal rape received at least one genital injury, whereas only four of the 68 Comparison participants (6%) presented with an injury. The Cases showed a high rate of injuries elsewhere with 361 (72%) presenting with injuries to the rest of the body (i.e., elsewhere than

Table 1
Composition of the Case and Comparison groups.

Feature	Category	Cases (N = 500)		Comparisons (N = 68)	
		N	%	N	%
Age	18–21	148	30	5	7
	22–29	142	28	8	12
	30–45	172	34	36	53
	>45	38	8	19	28
Menopausal status	Pre	471	94	55	81
	Post	29	6	13	19
Births by vaginal delivery	0	210	42	20	29
	1	89	18	9	13
	>1	201	40	39	57
Ethnicity	White	465	93	62	91
	Black	16	3	1	2
	Asian	10	2	3	4
	Other/unknown	9	2	2	3
Time from assault or intercourse to examination (h)	0–11	311	62	14	21
	12–23	116	23	26	38
	24–35	36	7	11	16
	36–48	37	7	17	25

Table 2
Nature of the assault for Case participants ($N = 500$).

	N	%
Relationship to alleged assailant		
Stranger	126	25
Acquaintance known > 24 h	78	16
Acquaintance known < 24 h	75	15
Former partner	72	14
Current partner	68	14
Friend	33	7
Client (prostitution)	19	4
Family member	16	3
Acquaintance, time unknown	13	3
Referral source		
Police	493	99
Self	7	1
Position		
Lying down/assailant on top/facing	444	89
Stood up/facing	21	4
Lying down/assailant on top/behind	14	3
Stood up/assailant behind	12	2
Other[a]	9	2

[a] Lying down/victim on top, sat down-on lap, on side, kneeling.

the anogenital region). Table 4 shows the number of participants with no, one or more injuries. Overall, there was a statistically significant difference between the two groups in the numbers of participants presenting with genital injuries (22.8% of Cases, 5.9% of Comparisons, $p < 0.01$), and remained significant when post-menopausal participants were excluded (22.3% of Cases, 3.6% of Comparisons, $p < 0.01$).

3.3. Locations of genital injuries sustained

Table 5 shows the numbers of participants presenting with injuries at each of the anatomical sites assessed. The posterior fourchette was by far the most likely area to be injured, in 14% of Cases. The labia were about half as likely as the posterior fourchette to be injured, at 8% of Cases. The other areas were much less likely to be injured (<2% of Cases). The posterior fourchette was also the site most likely to be injured in the Comparison group, although there were insufficient data to make any meaningful comparison of the sites distribution between groups. The difference in the rate of posterior fourchette injury between the two groups reached statistical significance at the 0.05 level, and remained significant when post-menopausal participants were excluded, but the numbers of the other injury types were too small to demonstrate differences at the other specific sites.

Table 3
Criminal justice outcomes for Case participants ($N = 335$).

Reached court	Outcome	N	%	Valid %[a]
No	Allegation withdrawn before trial	123	25	37
No	Client uncooperative, no action	51	10	15
No	Charges not brought, lack of evidence	48	10	14
No	Undetected[b]	39	8	8
No	Offender died/fled abroad	2	1	1
Yes	Conviction	32	6	10
Yes	Acquittal	23	5	7
Yes	Trial collapsed/dismissed	9	2	3
Yes	Allegation withdrawn during trial	8	2	2

See also Fig. 1 for relationship between outcome and injuries.
[a] Excludes the seven self-referrals and 158 Cases for whom outcomes could not be found.
[b] 'Undetected' is a police term that can mean either no suspect was identified or a suspect was identified but not charged.

Table 4
Numbers of injuries to genitalia.

Number of injuries to genitalia	Cases ($n = 500$)		Comparisons ($n = 68$)	
	N	%	N	%
0	386	77.2	64	94.1
1	73	14.6	1	1.5
2–8	41	8.2	3	4.4

3.4. Types and sizes of injury

The most frequently appearing injury was laceration, with 52 of the 500 (10%) Case participants sustaining at least one laceration. Most of these lacerations occurred to the posterior fourchette. There were 48 (10%) Case participants with abrasions. This injury type was more common in the labia, the second most injured genital site. Bruises were the most common injury type in the few Comparison participants who presented with injuries (3/5, 67%). The greater incidence of lacerations in the Cases than Comparisons was statistically significant ($p = 0.013$). This was also true for abrasions ($p = 0.02$). There was no such difference for bruises ($p > 0.05$), see Table 6. These injuries were small, the range of sizes is presented in Table 7.

3.5. Presence of injuries by characteristics of participant and assault

Within this study's 48-h time limit between reported rape and examination, there was no association between the presence of injury and the time from assault/intercourse in either the Cases (trend test, $p = 0.89$) or Comparisons ($p = 0.15$). Amongst the Cases there was no association found between client age and the presence of injuries (trend test, $p = 0.24$). Although there were relatively few post-menopausal women in this study, no association was seen with menopausal status ($p = 0.29$), numbers of children delivered vaginally ($p = 0.61$) or ethnicity ($p = 0.83$). Three of the four injuries found in the Comparison group were in women over the age of 45 years, although a formal trend test did not reach statistical significance ($p = 0.065$).

Overall there were no significant differences in the proportions with injuries between those with different criminal justice outcomes ($p = 0.59$, see Fig. 1). Injuries were more common in cases which resulted in a conviction of the defendant (11/32, 34%) than in all other cases for which criminal justice outcome was known (62/303, 21%). However, this difference did not reach statistical significance ($p = 0.075$). Of the complainants who withdrew or did not pursue the allegation 36/182 (20%) had injuries, a proportion which significantly exceeded that of the Comparison group ($p = 0.0064$). There are more injuries where the case was pursued (23/72, 32%) than where the case was dropped (10/48, 21%), but this difference was not statistically significant ($p = 0.21$ in Fisher's Exact Test).

More clients presented with injuries where the alleged assailant was known to the client (91/355, 26%) than where the assailant was unknown to the complainant (23/145, 16%), a difference which was statistically significant ($p = 0.019$, see Fig. 2). There was no association between position at time of assault and presence of injuries ($p = 0.58$). Specifically there was no difference whether the assailant was facing or behind the complainant either for all injuries ($p = 0.90$) or for injury to the posterior fourchette in facing positions (63/468, 13% with one or more injuries) or behind (6/32, 19%; $p = 0.42$).

4. Discussion

4.1. Types and locations of injuries

The posterior fourchette was the genital area most likely to be injured in both groups: in the Case group of participants reporting

Table 5
Presence and location of Injuries in Case and Comparison groups.

Site	Comparisons (n = 68)		Cases (n = 500)		Case vs Comparison Fisher's Exact p
	N^a	% positive (95% CI)	N^a	% positive (95% CI)	
All sites	4	5.9 (1.6–14.4)	114	22.8 (19.2–26.7)	<0.01
P. Fourchette	3	4.4 (0.9–12.4)	69	13.8 (10.9–17.1)	0.03
Labia	1	1.5 (0.0–7.9)	38	7.6 (5.4–10.3)	0.07
Vagina	0	0.0 (0.0–5.3)	11	2.2 (1.1–3.9)	0.38
Urethra	0	0.0 (0.0–5.3)	10	2.0 (1.0–3.6)	0.62
Hymen	1	1.5 (0.0–7.9)	9	1.8 (0.8–3.4)	1.00
Cervix	1	1.5 (0.0–7.9)	4	0.8 (0.2–2.0)	0.47

[a] Number of participants with at least one injury to a given genital site.

Table 6
Incidence of different injury types in Case (n = 500) and Comparison (n = 68) groups.

Injury type	Number of participants with this injury type				Case vs Comparison Fisher's Exact p
	Case		Comparison		
	N	%	N	%	
Laceration	52	10	1	2	0.013
Abrasion	48	10	1	2	0.020
Bruise	34	7	3	4	0.60

Table 7
Sizes (mm), were recorded, of injuries to Case participants (and Comparisons in brackets).

Injury	Dimension	Min.	Max.	Mean	St. dev.
Abrasion	Length	3 (2)	30	11.3	7.8
	Width	1 (1)	30	6.9	6.7
Bruise	Length	3 (3)	21 (10)	10.7 (5.3)	7.1 (4.0)
	Width	3 (3)	20 (10)	8.9 (5.3)	5.5 (4.0)
Laceration	Length	1 (3)	30	8	6.5
	Width	1 (1)	5	1.6	1.3

vaginal rape, posterior fourchette injury was sustained in 13.8% of cases, compared to only 4.4% (3/68) of Comparison participants. The second most injured genital area for Cases were the labia, but at almost half the rate of incidence observed at the posterior fourchette (7.8%). The lower rate and the small Comparison group sample size may account for the lack of a statistically significant difference between the two groups for labia injury. These findings partly match Geist's [4] findings that less severe lacerations are found here, but did not find severe injuries higher in the vault (or indeed anywhere) as Geist [4] found. The following is a discussion of the injuries as observed in the Cases at the different genital sites in descending order of frequency of occurrence:

- *Posterior fourchette:* This was the most injured site, most commonly with lacerations. They were typically half a centimetre by a millimetre in size.
- *Labia:* The labia were the second most injured site, and with a fair proportion of all injury types. As with the overall distribution of genital injuries, the posterior aspect had more injuries.
- *Vagina:* Unlike the pattern elsewhere, the large majority of injuries to the vagina are in the anterior part.
- *Urethra:* This site includes the area immediately surrounding the urethral opening. There are few injuries here, mostly bruises, and perhaps again due to the forced penetration.
- *Hymen:* All hymenal injuries were in the posterior aspect, and most of them were lacerations.
- *Cervix:* Three lacerations (two in one individual) and two bruises were observed. Since the cervix was visualised in all Cases the lack of injuries recorded here was not due to lack of visualisation.

4.2. Incidence of injuries and relationships with assault circumstances

This study demonstrates that only a relatively small proportion (23%, 95% CI 19–27%) of women alleging penile rape have demonstrable genital injuries. This number is however substantially higher than that seen in women who have had consensual intercourse (6%, 95% CI 2–14%). Whilst the finding for the consensual participants is similar to that in Lauber and Souma [5] of 5%, the finding for those alleging rape is nearly half of what they observed (41%) and so is closer to that found by Bowyer and Dalton [2], Palmer et al. [10], Solola, et al. [12], and Sugar et al. [9]. Note that the latter study also used only visualisation of objective injuries, such as the present study. With the relatively small numbers of Comparison participants and the low injury rate it is
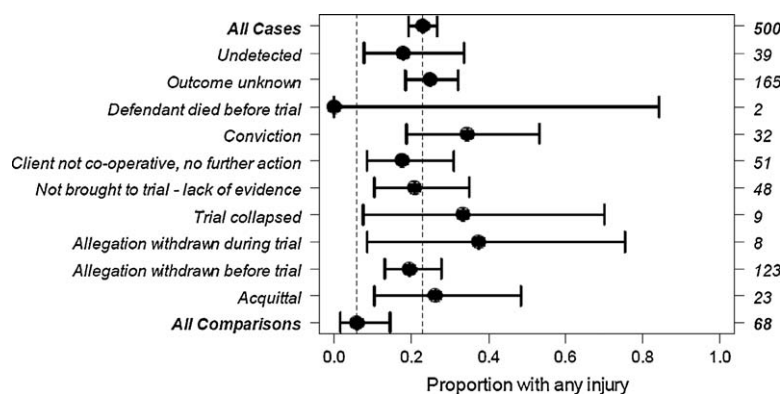

Fig. 1. Injuries and outcome in criminal justice system of Case participants. Injuries and outcome of Criminal justice system. Proportions with injuries and 95% CI for Cases and Comparison group by outcome. Numbers of individuals with each outcome are shown down right hand axis. Dotted lines show proportions for cases and comparisons.
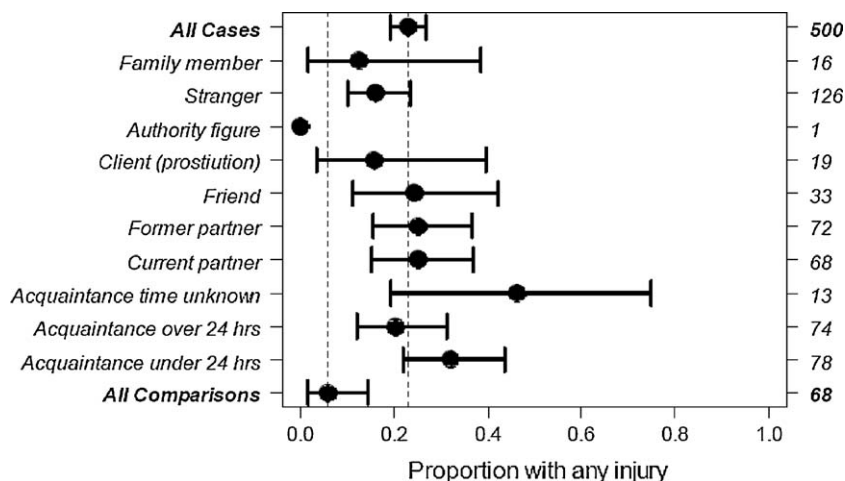
Fig. 2. Injuries and relationship of victim to alleged assailant of Case participants. Injuries and relationship to victim. Proportions with injuries and 95% CI for Cases and Comparison group by relationship. Numbers of individuals with each outcome are shown down right hand axis. Dotted lines show proportions for cases and comparisons.

not possible to draw conclusions as to whether specific injury sites or types are more prevalent following non-consensual intercourse. It is clear that neither the presence nor absence of injury can be used to establish the veracity of a rape allegation. However, at the population level, non-consensual intercourse is more likely to cause genital injuries than consensual intercourse.

The analysis of criminal justice outcomes was restricted by the large amount of missing data. Many of the unknowns were untraceable due to a crime number not having been allocated to the report. This suggests that those investigations did not proceed far through the legal system. Where the alleged assailant was know to the complainant, the probability of injury was higher than when the assault was committed by a stranger (26% cf 16%), repeating the findings of Field and Bienen [17]. This could suggest more resistance during rape by a person known to the complainant and/ or "freezing" in stranger rape due to fear. It could mean that the women raped by their partners tend to report only when they realise that they have corroborating evidence and so feel there is more chance of being believed. There were no significant associations between the presence of injury and demographic factors, or the details of the assault (age, parity, ethnicity, time elapsed between assault and examination, and sexual position), although there was limited statistical power for some of these comparisons. Others [13] have reported higher rates of genital injury associated with greater chronological age and/or post-menopausal status. This study had little statistical power to detect such an effect, but the absence of evidence for an association is supportive of the negative findings of Sommers et al. [15].

4.3. Study limitations

The age distributions in the Cases and Comparisons differed substantially, however neither group had a large proportion of post-menopausal women and no association between age and injury was found in this study. Menopausal had no effect other than in two specific areas (injuries to labia and abrasions). There was a difference in presentation time between the groups, but no decrease in the injury rate over the 48-h time window was observed in this study. Despite significant efforts the authors were unable to recruit the planned number of women in the Comparison group, which inevitably reduced how representative the Compari-son group was of the general population and the precision of the prevalence estimates (by approximately a factor of two compared to the study design). The large number of unknown data for criminal justice outcomes was also unfortunate and may have

masked what could have been significant findings. Since the start of this study a system has been put in place to routinely inform the Centre's records of the progress of cases through the criminal justice system. Despite these limitations, the data do provide useful and, crucially, reliable comparisons.

5. Conclusion

This study has found that less than a quarter of adult complainants of penile–vaginal rape by a single assailant sustain an injury to the genitalia that is visible within 48 h of the incident. Whilst this is approximately three times more than women who sustain a genital injury during consensual sex, it is most important to recognise that over three quarters of all complainants do not sustain any genital injury.

Acknowledgments

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