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Body's Testimony: Injury Patterns in Sexual Assault Survivors of South-Central Mumbai

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ABSTRACT

According to UNICEF, globally, an estimated 650 million girls and women, or approximately 1 in 5, have been subjected to sexual violence during their childhood[1]. Both the physical healing and the legal pursuit of justice for survivors of sexual violence depend on the timely treatment and comprehensive documenting of extra-genital and genital injuries.This prospective observational study was conducted at a tertiary care facility in central-southern Mumbai from January 2016 to June 2017. A total of 160 survivors of alleged sexual assault, fulfilling inclusion criteria, were included in the study. The main aim of the study was toobserve the Injury patterns on survivors of alleged sexual assault presenting to the tertiary care facility, with a specific focus onextra-genital and genital trauma. In the study, we observed, majority of sexual assaults involved peno-vaginal penetration (84.37%), with genital injuries being the most common (69.38%). Hymenal tears at the 7 o'clock position was frequently observed (7.5%), often in conjunction with older tears (60.40%). Anal injuries were rare (6.25%). A significant proportion of survivors presented late for examination (25.62%).

Keywords: Sexual assault, Genital Injury, Forensic examination, Injury patterns

Introduction

According to the World Health Organization (WHO), nearly 1 in 3 women worldwide, about 35%, have experienced either extra-genital or sexual violence at some point in their lives[2]. These numbers demonstrate the global and appalling prevalence of violence against women and girls.India reported 31,000 rapes in 2022, and the number unchanged since 2012. Mumbai ranks 5th in crime against women in metropolitan cities[3]. India's Health ministry, recognizes the health sector's role in preventing and eliminating sexual assault. Laws like the Criminal Law Amendment Act and the POCSO Act of India 2013,aim to protect survivors and ensure justice.

Sexual assaults often occur without witnesses, making the survivor's account the primary source of evidence.This reality underscores the critical role of documentation and injury identification.In questionable situations proper documentation can help

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overcome potential prosecutorial biases. The patterns, injuries, even subtle ones, can provide valuable insights into the nature of the assault. This study aims to detect and examine injury profiles, with a particular emphasis on genital and extra-genital injuries in cases of sexual assault.

Methodology

This prospective observational study was conducted by the department of forensic medicine t a tertiary care facility in Mumbai, over a period of one and half years, January 2016 to June 2017. All survivors of alleged sexual assault examined during the study period of one and a half years who fulfilled the inclusion criteria were included in this study, comprising a total of 160 cases.

Inclusion criteria:

a) All the survivors of alleged sexual assault brought for medico-legal examination with request for examination by the police/ magistrate;

b) All the survivors of alleged sexual assault brought for examination directly to hospital without registering the crime.

Exclusion Criteria:

a) Survivors of alleged sexual assault who refused to give consent for medico-legal examination;

b) Dead bodies with alleged history of sexual assault.

A team of doctors from department of Forensic medicine and Obstetrics and gynecology were involved. Type of sexual assault, presence and distribution of extra-genital, genital and anal injuries, distribution of injuries to hymen, condition of clothes and duration of reporting were studied.

Objectives:

1) To describe the types and distribution of both extra-genital and genital injuries in sexual assault cases.

2) To assess the condition of the hymen, including the presence and specific positions of injuries, in cases involving genital injury,

3) To assess the patterns of clothing/changes and reporting delays among sexual assault survivors and their impact.

Data source: For a subsequent group assessment, all information gathered from various sources such as casualty records, medico-legal report of survivors, were entered into a pro-forma that was specifically created for each case.

Data analysis: The data was entered and analyzed by using MS-Excel SPSS software package. Frequency of all variables was derived to check completeness of data. Magnitude was expressed in percentages.

The study was conducted following approval from the Institutional Ethics Committee (IEC) II, of Seth GS Medical College & KEM Hospital, Mumbai, reference number: EC: 262/2015, dated: 03-March-2016.Confidentiality of subjects were strictly maintained throughout the study.

Results

Table 1: Distribution of cases bytype of sexual assault

Type of act as per alleged history	No. of cases	Percentage
Peno-vaginal penetration	135	84.37
Peno-anal penetration	18	11.25
Digital- vaginal penetration	1	0.62
Peno-oral penetration	1	0.62
Molestation/fondling	5	3.125
Total	160	100

Table 2: Distribution based on presence of extra-genital*and genital injuries

Type	No. of Cases	Percentage
Extra-genital Injuries	26	16.25
Genital Injuries	111	69.375
Injuries absent	23	14.375
Total	160	100

(**extra-genital=general body excluding genitalia*)

Table 3: Distribution of extra-genitalinjuries by location and type of injury

	Location	Type of Injury			
		Abrasion	Contusion	Laceration	Burns
Body	Head, Neck & Face	3	1	0	
	Upper Limb	5	1	1	
	Lower Limb	0	2	0	1
	Chest & Abdomen	2	1	0	
	Back	4	3	1	1
Total(%)		14 (8.75%)	8 (5%)	2 (1.25%)	2 (1.25%)

Table 04: Distribution of genital injuriesby location and type of injury

			Abrasion	Contusion	Tear
External Genitalia		Labia Majora	3	0	0
		Labia Minora	4	0	0
		Posterior Fourchette	2	0	0
	Hymen	2 O'CLOCK	0	0	3
		3 O'CLOCK	0	0	9
		4 O'CLOCK	0	0	5
		5O'CLOCK	0	0	5
		6O'CLOCK	0	0	10
		7O'CLOCK	0	0	12
		8O'CLOCK	0	0	4
		9O'CLOCK	0	0	7
		10O'CLOCK	0	0	1
		11O'CLOCK	0	0	2
		12O'CLOCK	0	0	1
Total (%)			**9 (5.625%)**		**60 (37.5%)**

(*No injuries found at urethral orifice, clitoris & perineum)

Table 5: Distribution of hymen condition among all the cases

Hymen findings		No. of cases	Percentage
Intact		52	34.89
Torn	Fresh tear	07	4.69
	Old tear	90	60.40

Table 6. Distribution bytype of anal injury

Type of Injury	No. of cases	Percentage
Tear	05	3.13
Fissure	04	2.5
Redness	01	0.6
Total	**10**	**6.25**

Table 7: Distribution by findings of survivor's clothing

Condition of clothes	No. of cases	Percentage
Stained by blood	1	0.62
Stained by semen	2	1.25
No stain	22	13.75
Clothing/apparels changed	135	84.38
Total	**160**	**100**

Discussion

Table 01.Type of Sexual Assault.

Peno-vaginal penetration was the predominant mode of assault in our study, based on the alleged

Table 8: Duration of reporting following assault

Duration of Reporting	No.of Cases	Percentage
0-12hrs	18	11.25
12-24hrs	25	15.62
24hours-72hrs	15	9.35
3days-7days	34	21.25
7days-1month	27	16.87
>1month	41	25.62

Fig. 1: Contusions over the upper arm

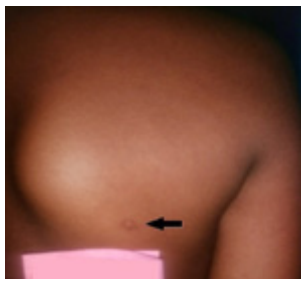

Fig. 2: Healed burns over the scapular region with puckering at the centre.

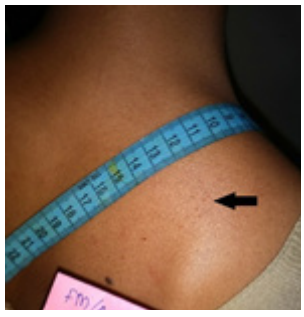

Fig. 3: Finger nail abrasions over the back.

history, accounting for 84.37% of cases. Similar findings were reported in studies from Mumbai by S. Tyagi et al[4]. (89.7%) and A.K. Jaiswani et al[5]. (58.2%), where peno-vaginal penetration was identified as the most common type of sexual assault.

Peno-vaginal penetration is a common form of sexual assault because it aligns with the assailant's intent to dominate and violate sexual boundaries in a way that often targets primary sexual organs.

Table 02. Distribution based on presence ofextra-genital and genital injuries.

The table indicates that genital injuries were the most prevalent, occurring in 69.38% of cases, significantly higher than extra-genital (general body injuries other excluding genital injuries) injuries, which were observed in only 16.25% of cases. In 14.38% of cases, no injuries were reported.

These findings are consistent with those of A.K. Jaiswani et al.,[5] who reported genital and extra-genital injuries in 30.9% and 24.9% of cases, respectively. S. Haridas et al.[6] (Delhi) observed extra-genital injuries in only 1.91% of cases, while Sarkar et al.[7] (Delhi) documented extra-genital injuries in 6.7% of survivors. S.K. Maring et al.[8] (Manipur) reported genital injuries in 75.7% of cases, with extra-genital injuries noted in only 14.8% of cases, where survivors belonging to under 18 years.

A similar study from Tunisia (O. Brahim et al.[9]) reported that evidence of genital trauma was found in 87% of cases. A striking parallel can be drawn with a study conducted in Bahrain, located in West Asia (F.A.R. Alfadhel et al[10].), where only one-third (30.9%) of the subjects exhibited extra-genital injuries. Comparable rates were reported in studies conducted in Egypt (30%) and Spain (30.6%).[10]

This suggests a strongrelationship between the mode of assault and the occurrence of genital injuries. Given that peno-vaginal penetration typically involves direct contact with genital structures, it is reasonable to infer that this mode of assault significantly contributes to the high incidence of genital injuries.

Table 03. Distribution of extra-genital injuries by location and type

As discussed above extra-genital injuries were less prevalent than genital injuries. Abrasion was the most common injury type in extra-genital

examinations (8.75%), followed by contusion (5%). The least observed injuries included lacerations and burns, each at 1.25%. Abrasions were mostly seen in upper limbs followed by back.

Which is very much aligned with AK Jaiswani et al[5]. where the majority of the extra-genital injuries were abrasion (26.4%) followed by contusion (15.09%). Haridas et al.[6] reported common body injuries seen are scratch abrasions and contusions mostly on face, neck and breast. FAR Alfadhel et al.[10] and O Brahim et al.[9] reported a slight variation, with contusions (24.6% and 70.8%, respectively) being the most common type of injury, followed by abrasions (11.4% and 51.7%, respectively).

Abrasions occur when the skin rubs or scrapes against a rough surface. During a sexual assault, defensive actions (e.g., pushing, shielding) often involve the upper limbs, explaining the high frequency of abrasions in these areas. The differences in injury patterns between your study and those of others may stem from, perpetrator behavior, or environmental factors (e.g., use of objects during the assault). For example, higher rates of contusions in FAR Alfadhel et al[10]. might suggest greater use of blunt-force trauma in their study population.

Table 04. Distribution of external genital Injuries by location and type

In this study, tears were the most commonly observed injury to external genitalia, seen in 60 cases (37.5%), primarily involving the hymen, followed by abrasions in 9 cases (5.625%), which were mostly present on the labia minora in 4 cases (2.5%).

Similarly in the study by AK Jaiswani et al[5]. the most frequent external genital injury was observed was laceration/tears (48%), majority at posterior fourchette; 38 (48%) casesfollowed by labia minora (<1%).

Brahim O et al.[9] also reported majority of injuries especially laceration/tear at the posterior fourchette(82.5%). RR Zilkens et al.[11] (Australia) reported, the most frequent genital injuries in women reporting completed vaginal penetration were lacerations (13.1%), followed by abrasions (11%). The posterior fourchette was the most common site of injury (7.4%), followed by the fossa navicularis (6.8%) and labia minora (6.1%).

The posterior fourchette is located at the junction where tension from penetration is concentrated, particularly during vaginal penetration. Probably why multiple studies, including ours, and by AK Jaiswani et al[5]. and Brahim O et al[9]., report the posterior fourchette being most common site for tears.Tears result from excessive stretching of the genital tissue during forceful penetration. This is likely to occur in non-consensual encounters where the tissue is not adequately prepared or lubricated, leading to increased friction and trauma.Abrasions are reported more frequently on areas like the labia minora due to their external location and exposure to rubbing or shearing forces during the assault. However, their overall incidence is lower compared to tears.

7 o'clock position was the most frequently observed location of hymenal tears, representing 12 cases (7.5%). This was followed by the 6 o'clock position with 10 cases (6.25%)

Ak Jaiswani et al.[5] reports most common site between 6 and 9 o′ clock (35.7%) followed by 12 and 3 o′ clock (28.6%) position. Almost similar observation by S Tyagi et al.[4] who reported, maximum in 5 o' clock positions (24.39%) followed by 7 o'clock positions (19.51%). O Brahim et al[9]. reported most common position of tear between 3 and 9 o'clock, and between 5 and 7 o'clock.

The hymen is often described using a clockface, with 12 o'clock near the urethra (anterior) and 6 o'clock toward the anus (posterior). In this study, hymenal tears were most frequently observed at the 7 o'clock and 6 o'clock positions. The posterior hymen, being less elastic and poorly vascularized, may be more prone to tearing[12]. Factors like the type of act, assailant's position, and assault duration further influence injury patterns, with the posterior region frequently affected. Studies by AK Jaiswani[5], S Tyagi[4], and O Brahim[9] also highlight the prevalence of posterior tears.

Table 05. Distribution of cases based on the condition of hymen

In 97 (60.63%) cases hymenal tear was found. Among the tear majority were old tear 90 (60.40%) followed by 07(4.69%) of fresh tear. Haridas et al[6]. (91.44%), Sukul et al.[13] (86.2%), S Bandyopadhay et al[14]. (42%), UB Roy Choudhari et al[15] (72%), all of them observed that in maximum cases, the hymen showed old tears. FAR Alfadhel et al.[10] reported 45.6% of survivors had old hymen tears and only 6.6% of survivors had recent hymen tears.

The predominance of old hymenal tears in sexual assault cases, as reported in multiple studies above, can be attributed to various factors. Anatomically, the hymen's elasticity and susceptibility to tearing vary, and prior sexual activity or past trauma often results in old tears being more commonly observed during examinations. Additionally, delayed reporting by survivors is a significant factor, as fresh tears heal relatively quickly, making old injuries more likely to be documented. This pattern aligns with findings from studies like Haridas et al[6]. and FAR Alfadhel et al[10]., where old hymenal tears were prevalent due to delayed reporting and prior hymenal trauma.

Table 06. Anal Injuries

Anal injuries were noted only in 10 (6.25%) cases, primarily consisted of tears (3.13%) and fissures (2.5%). In one case redness was noted. AK Jaiswani et al[5] reported 12 (2.72%) cases of anal injury, among that most common type of injury was laceration/tear (1.82%) followed by contusion (0.45%) and abrasion (0.45%).S. Tyagi et al[4]. observed anal injuries in 5.17% of cases, Alfadhel F.A. et al[10]. in 2.9%, and S.C. Sarkar et al[7]. in 7% of cases.Research indicates that injuries from anal penetration especially involving male survivors, are often underreported due to embarrassment or the stigma associated with anal trauma, impacting prevalence data[13].

Table 07. Condition of clothes of the survivor at the time of examination

The majority of survivors had changed clothes by the time of examination (84.38%). Among those who retained their original clothing, only in least number cases, evidence of from clothes are obtained, seminal stains (1.25%) and blood-stained clothes (0.62%) in present study.

The observation that the majority of survivors had changed clothes by the time of examination (84.38%) aligns with findings from other studies, such as Rahul Jain et al[16]. (41%),and AK Jaiswani et al[5]. (90%). Changing clothes and bathing are common behaviors post-assault due to psychological distress or the survivor's attempt to regain a sense of cleanliness and normalcy. However, these actions result in the loss of critical biological trace evidence, such as seminal stains, blood, or torn clothing, which are vital for forensic analysis and can significantly impact the trial outcome.

Table 08. Duration of reporting

The most common timeframe for reporting cases was over one month after the assault (25.62%), followed by 3-7 days (21.25%) and 7 days to 1 month (16.87%). The shortest reporting duration, 0-12 hours, accounted for only 11.25% of cases, making it the least frequent.

Similarly, a study by Rahul Jain et al[16]. reported that only 18% of cases were reported within 12 hours. Haridas et al[6]. found that the majority of cases (74.34%) were brought for medical examination more than 7 days after the alleged incident, while only 13.15% were examined within 24 hours. Comparable findings were observed by Sarkar et al.[7]

Delay in reporting can significantly affect the detectability of injuries in physical examination.

Delays often stem from psychological barriers like trauma, fear, and stigma, logistical challenges such as lack of access to medical or legal facilities, and distrust in the justice system.

Conclusion

Peno-vaginal penetration was linked to a high occurrence of genital injuries, with hymenal tears being the most common. Extra-genital injuries, though less prevalent, were observed on areas such as the head, neck, and upper limbs, indicating force or resistance during the assault.

Old hymenal tears were more common than fresh ones, likely due to delayed reporting.

The absence of injuries (14.38%) underscores the importance of understanding that sexual violence can occur without leaving visible extra-genital evidence.The absence of injuries and the lower prevalence of extra-genital injuries observed in this study may be attributed to delays in reporting by participants. This delay could potentially allow for the natural healing or resolution of injuries, thereby reducing the likelihood of their detection during the examination or assessment process. Additionally, the majority of survivors had changed clothes before assessment, potentially hindering the recovery of critical forensic evidence.

Recommendations

It is crucial to establish accessible, confidential, and survivor-friendly reporting mechanisms. Community education on the importance of legal and medical procedures can empower survivors to seek help. Many studies, report that literature on sexual assault examinations shows disparities due to a lack of uniformity in examination protocols, injury classification, and examiner qualifications[17]. Thisshould be addressed by implementing guidelines by apex health bodies. Strengthening and expanding laws defining rape and sexual assault, sensitizing and training police and judges about sexual violence, and improving the application of existing laws are crucial steps in addressing this issue.

Limitations

The study was conducted at a single tertiary care facility, limiting the generalizability of its findings. The study focused on physical injuries and did not address the psychological or social impacts of sexual assault, which are crucial for understanding the broader consequences for survivors. The absence of standardized protocols for examining and recording injuries across different examiners may have introduced inconsistencies. A significant proportion of survivors presented late for examination which may have affected the data.

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