

Analysis of Medicolegal Examination in Alleged Sexual Abuse Presented to a Tertiary Care Hospital in Sri Lanka

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Abstract

Forensic experts are often expected to provide an opinion on alleged physical or sexual contact between individuals following medicolegal examination of a case of sexual abuse (SA). There are many factors influencing the opinion. A retrospective descriptive study was performed to study the factors influencing the medicolegal opinion in SA forensic examination using medical and medicolegal records of alleged SA victims to extract data. Records of 441 victims were studied. A majority, 180 (40%), presented due to the guardian's concerns – 302 (68%) presented for medicolegal examination 72 h after the incident. Recent injuries were observed in only 15% of the victims. Genital injuries were observed in 74% of the victims brought due to concerns of the guardians, with 12 victims having recent injuries. Of the 172 victims who complained of vaginal intercourse, 21% had recent injuries. A firm positive medicolegal opinion could be given in 63% of all cases. In 124 individuals, a firm positive or negative opinion could not be given. A majority ($n = 90$, 73%) of these individuals did not have any injuries, while 23% had healed injuries. According to the nature of the complaint, in a significant number of victims (53%), no scientific evidence was present to make a firm opinion. The nature of the sexual act and the absence of injuries influence the medicolegal opinion on SA, making it a challenging task for forensic experts.

Keywords: Evidence, forensic, injuries, opinion, sexual abuse

BACKGROUND

Sexual assault is a crime and a form of violence against a person's body and will, which amounts to substantial public health concern with a global prevalence of approximately 35% of women experiencing sexual abuse (SA).^[1-4] SA is defined as coercing a person to perform or undergo sexual activity against their will and without consent by violence, encompassing instances such as rape, marital infidelity, SA, forced or child marriage, denial of the right to use contraception, and forced abortion.^[5] Rape is included in sections 363 and 364 of the Penal Code of Sri Lanka, whereas other forms of SA are contained in section 265.^[5]

The victims of SA are often subjected to brutal physical and psychological aggression or oppression, leading to many short- and long-term physical and mental adversities.^[6]

According to a survey conducted in 2010, nearly 1 in 5 women (18.3%) and 1 in 71 men (1.4%) in the United States have been raped at some point in their lives, including

completed forced penetration, attempted forced penetration, or alcohol/drug-facilitated completed penetration.^[7] Sri Lankan figures on sexual violence against women, although not available in the Global Database on Violence against Women, well indicate the local burden of SA.^[8] According to the "Grave Crime Abstract" published by the Sri Lankan Police, 9401 cases of rape and incest have been reported in the last 5 years, with an increasing trend of 12% from 2017 to 2021.^[9]

The aim of medicolegal examination in the case of SA is to document an alleged physical or sexual contact between individuals and to substantiate the victim's and the assailant's

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history. The forensic medical expert is expected to be objective and equipped with specialized technical skills needed to formulate a scientific opinion to fulfill these objectives. As argued by Walker in his review, the best forensic approach to the medicolegal examination of an alleged case of SA would be to employ one's clinical judgment in conjunction with scientific evidence to provide an opinion on the consistency of examination findings with the history of alleged events.^[10] Although physical signs of SA can often be minimal, proper documentation of medicolegal examination findings is essential in assisting the criminal justice system, as injuries have a significant, positive association with prosecution rates of sexual assault and conviction.^[11,12]

Considering the ramifications of criminal justice, assessing the type, location, and severity of genital, anal, and extragenital injuries provides valuable scientific evidence in evaluating alleged SA.^[13] The injury pattern can be used for deductive reasoning in differentiating between consensual and nonconsensual sexual acts. However, it should be noted that some victims of SA may not sustain significant injuries due to the act itself. The presence or absence of injuries depends on many variables, such as the nature of the event, age of the individual, and time of presentation.^[14-16]

From the perspective of law, when providing evidence in an SA case, a medicolegal expert has to answer whether sexual contact has occurred, with whom, and whether it was consensual.^[17] To answer these questions, forensic experts often use a combination of direct visualization, nuclear staining, and colposcopy examination and formulate their opinion corroborating or refuting the plaintiff's history of events relating to the available scientific evidence.^[10,18] Therefore, it is essential to better understand the presentation, pattern, and prevalence of genital injuries in the local population, as these can be highly variable between different geographical regions. Therefore, we designed a retrospective descriptive study on females presented with alleged SA to fill the gaps in our knowledge on Sri Lankan demographics and to study different variables that can influence the medicolegal opinion on genital and nongenital injuries.

Objectives

The study aimed to analyze the presentation, patterns, and prevalence of injuries among females presenting with alleged SA to determine the factors influencing the medicolegal opinion.

METHODS

A retrospective descriptive study was conducted using the records of victims of alleged SA presented to the Colombo North Teaching Hospital, Ragama, Sri Lanka, over 4 years (2014–2017). After obtaining approval from the Ethics Review Committee of the Faculty of Medicine, University of Kelaniya, Sri Lanka, the study was performed. Medicolegal examination forms, medicolegal reports, and other case materials, such as copies of bed head tickets, were

used for data extraction. A pro forma was used to extract information on historical details, examination findings, investigations, management details, and the medicolegal opinions given for each case to fulfill the objectives of the study. The data were analyzed using Statistical Package for the Social Sciences IBM SPSS Statistics for Windows, Version 22.0. (Armonk, NY: IBM Corp). Descriptive statistics were computed for all study variables and presented as frequencies and percentages. In addition, the study sample was stratified by opinion, and groups were compared using the Chi-squared test for categorical variables for significance.

Ethics approval and consent to participate

Ethical approval was obtained from the Research Ethics Committee of the Faculty of Medicine, University of Kelaniya, Ragama, Sri Lanka on 20/01/2015 and the item number is P-04/01/2015. Since this is a retrospective study based on records of the patients, (anonymized data) the Research Ethics Committee of the Faculty of Medicine, University of Kelaniya, Ragama, Sri Lanka approved to carry out the study without obtaining the consent of the participants.

RESULTS

During the 4 years considered for the study, 441 females had been brought for medicolegal examination following alleged SA. A majority of the study sample was <18 years of age ($n = 353$, 80%), thus categorized as minors, and the rest were adult females, out of whom 13% ($n = 56$) were unmarried and 7% ($n = 32$) were married. Among the study population, most were in the reproductive age group (15–49 years). There were 85 (19%) prepubertal and four postmenopausal victims. One-third of the minors ($n = 106$), produced for medicolegal examination, were found to have eloped with their boyfriends.

Over two-thirds ($n = 391$, 89%) of the female victims were accompanied to the hospital by another person. Forty-one percent ($n = 180$) of them were brought solely due to parental concerns alone in the absence of complaints by the victim. Nearly half of the victims (40%) complained of vaginal/anal intercourse. A majority were brought for medicolegal examination 72 h after the alleged incident, and 8% ($n = 32$) of them were pregnant or had delivered or miscarried by the time of presentation [Table 1].

Most of the victims ($n = 409$, 93%) had been sexually abused by a person known to them. In 91% of the instances, it had been a single perpetrator. Half of the victims ($n = 182$, 41%) alleged repeated SA, while 13% ($n = 57$) complained of being abused for more than 6 months. More than one-third of the females ($n = 169$, 38%) also complained of being subjected to threats in verbal or physical forms. Only 27% of them had tried to resist the assault [Figure 1]. Young adults (14–18 years of age) had been mainly brought for medicolegal examination due to parental concerns ($n = 132$, 63%), while vaginal intercourse was the most common presenting complaint among other age categories. Out of the 172 victims presenting with the complaint of vaginal intercourse, 39% ($n = 67$) were

Table 1: Historical details of the presentation

Category	Frequency (%)
Presenting complaint	
Parental concern	180 (40.8)
Vaginal intercourse	171 (38.8)
Fondling	28 (6.3)
Intercrural intercourse	22 (5)
Multiple complaints	21 (4.8)
Fingering	9 (2)
Anal intercourse	5 (1.1)
Other forms of sexual abuse	5 (1.1)
Total	441 (100)
Time elapsed before the presentation (h)	
<12	3 (0.7)
12-24	47 (10.7)
25-48	34 (7.7)
49-72	28 (6.3)
>72	302 (68.5)
Details not available	27 (6.1)
Total	441 (100)
Pregnancy indicators	
Period of amenorrhoea	
<8 weeks	5 (1.1)
8-24 weeks	22 (5)
>24 weeks	5 (1.1)
Delivered baby	4 (1)
Miscarriage	1 (0.2)
No	404 (91.6)
Total	441 (100)
Urine beta hCG	
Positive	29 (6.6)
Negative	251 (56.9)
Not done	161 (36.5)
Total	441 (100)

HCG: Human chorionic gonadotropin

adults (>18 years). Intercrural intercourse, fingering, and fondling were the main complaints observed among younger victims under 14 [Table 2].

In the study group, encountering an unknown perpetrator was mostly observed among the adult SA victims (60%, $n = 18/30$). In addition, 60% of the adult victims ($n = 53/88$) had resisted the act, while only 19% of the children ($n = 66/353$) gave an account of resisting the act of abuse. Nongenital injuries were observed in only 9% of subjects ($n = 38$), and 33 of them had contusions/abrasions/lacerations, while one had a fracture and four victims had healed scars. Most nongenital injuries ($n = 26$, 68%) were observed among those above 18 years of age who had also admitted to resisting the assault [Table 2].

Only 11 victims (2.5%) had evidence of parasexual injuries. Recent genital injuries alone or old injuries were observed in only 15% of the victims ($n = 65$), whereas a majority ($n = 242$, 55%) had old injuries, and two victims had a recent vaginal delivery. Of the recent genital injuries, 68% ($n = 44$) were

observed in the hymen with or without injuries to other sites. Of the five patients with anal injuries, one victim had injuries involving the anus and hymen. There were five victims with isolated injuries to the vaginal wall without injury to the hymen. Hymenal and vaginal injuries were mainly observed among adult female victims, while vulval and perineal injuries were mainly observed among minors, especially those below 12 years ($n = 6/12$, 50%) [Table 2].

Out of the 172 victims who alleged vaginal intercourse, 36 (21%) had recent injuries with or without old injuries. A majority of victims ($n = 119/180$, 66%) who were brought due to parental concern had old/healed genital injuries, and 7% of them ($n = 12$) had recent injuries, including a victim with recent vaginal delivery. In contrast, only 23% were found to have unremarkable genital findings [Table 3]. The majority (75%, $n = 44/59$) presenting with the complaint of intercrural intercourse/fingering/fondling did not have any apparent genital injuries. The most common form of hymenal injury observed with all the presenting complaints was the attenuated hymen ($n = 156$, 87%), which was also evident in five of the cases presenting with intercrural intercourse/fingering/fondling. Out of the 65 cases with recent genital injuries reported in the sample, 36 (55%) were observed among the victims complaining of vaginal intercourse, while many had hymenal tears ($n = 28$, 78%). Only ten victims presenting with multiple complaints had evidence of any recent genital injuries, with eight of them having abrasions and contusions in the genital areas [Table 3].

A firm positive opinion such as “evidence of recent vaginal penetration” or “evidence of repeated vaginal penetration” could be given in two-thirds of victims ($n = 280$, 63%), and a firm negative opinion such as “no evidence of vaginal penetration” as per the allegation was given for 36 (8%) victims. Nearly one-third of the cases ($n = 125$, 28%) included in this study had been concluded without any firm opinion due to failing to corroborate or refute the stated allegation. One-third of the victims who were not given a firm positive or negative opinion ($n = 48$, 39%) had complaints such as intercrural intercourse, fondling, or fingering.

Many younger victims (<12 years: 64.5%, <14 years: 51.4%) were not given a firm opinion, whereas most older girls or victims older than 14 years of age and adult female victims were given a firm positive or a negative opinion. A firm positive opinion was given in 82% of the victims presenting with the complaint of repeated SA. There was no significant difference in the final opinion between the late and early presenters following alleged SA, as 63% of the victims who presented before 72 h and 74% of the victims who presented after 72 h were given a firm opinion at the medicolegal examination ($P = 0.061$). A firm positive opinion was given in most victims complaining of vaginal intercourse ($n = 125$, 73%) and brought due to parental concerns ($n = 126$, 70%). A firm positive opinion was given in 61 out of the 65 (94%) victims with recent injuries.

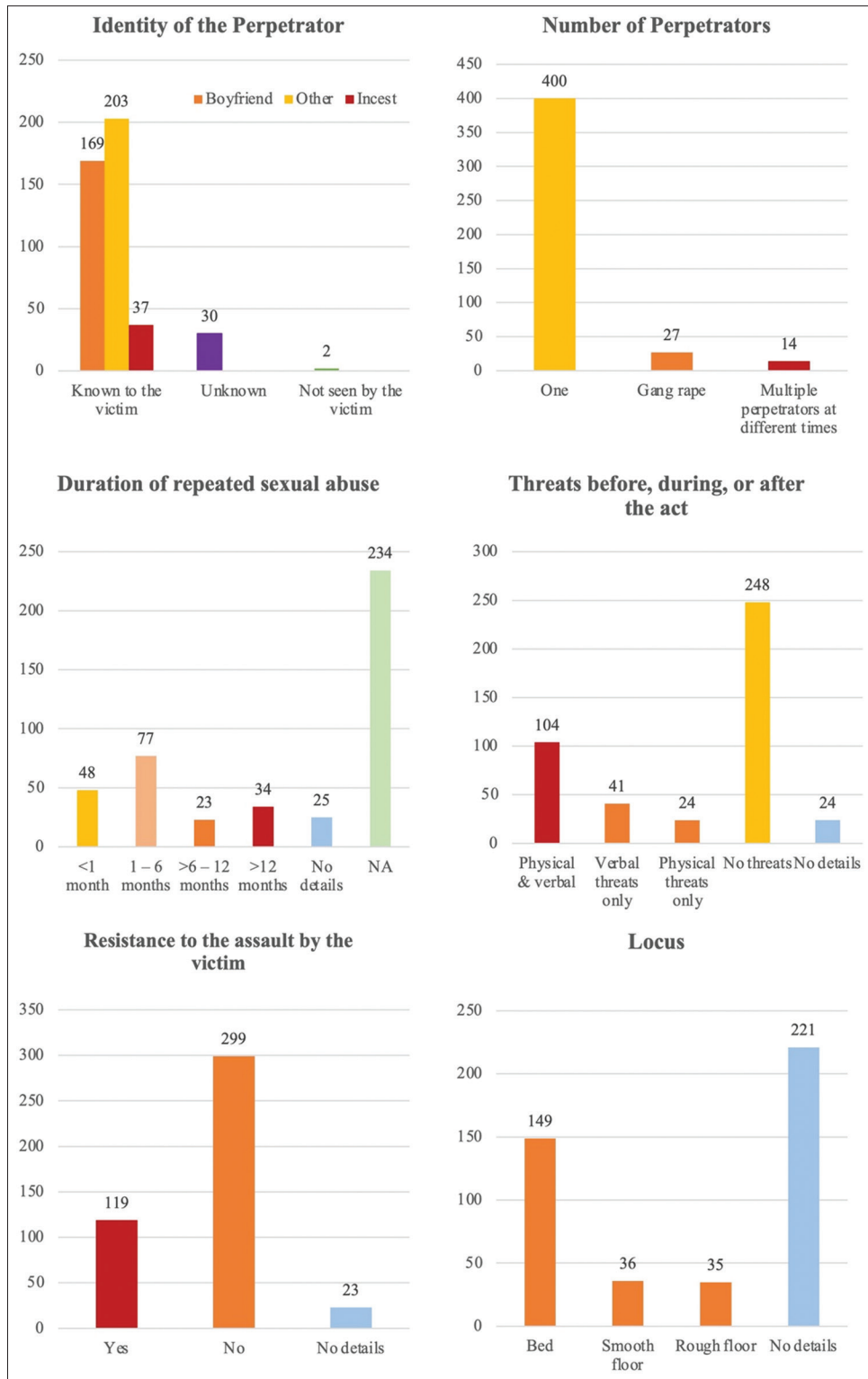


Figure 1: Historical details of the complaint

Similarly, it was also possible in 89% of the victims ($n = 215$ out of 242) with old injuries ($P = 0.84$). The four victims with recent genital injuries who were not given a firm opinion had those injuries in the vulva or perineum identified as abrasions or contusions. Failure to reach a firm opinion, despite the presence of positive hymenal findings ($n = 21$, 78%), was

primarily associated with examination findings of dilated hymen, reduced tone, normal but stretchable hymen, and the presence of a notch in the hymen [Table 4].

The Chi-square test was applied to assess any statistical significance in providing firm positive or negative opinions

Table 2: Comparison of presentation and findings of examination with the age of the victims

Presentation and examination findings	Age categories in years					Total
	<12	12-<14	14-<16	16-<18	>18	
Presenting complaint versus age of the victim						
Parental concern	13	23	94	38	12	180
Vaginal intercourse	21	25	38	21	67	172
Anal intercourse	1	2	2	0	0	5
Intercrural intercourse	8	4	8	1	1	22
Fingering	9	0	0	0	0	9
Fondling	15	7	5	0	1	28
Multiple complaints	8	4	2	1	6	21
Other	1	1	1	1	1	5
Total	76	66	150	61	88	441
Details of the perpetrator versus age of the victim						
Known to the victim	73	64	147	55	70	409
Known and unknown	0	3	2	0	3	8
Unknown	3	1	2	6	18	30
Not seen by the victim	0	1	1	0	0	2
Total	76	66	150	61	88	441
Attempted resistance versus age of the victim						
Yes	21	16	18	11	53	119
No details	55	50	132	50	35	322
Total	76	66	150	61	88	441
Presence of other injuries versus age of the victim						
Present	4	3	3	2	26	38
Absent	72	63	147	59	62	403
Total	76	66	150	61	88	441
Location of recent genital injuries versus age of the victim						
Hymen + vagina +/- vulva	6	6	8	5	18	43
Vagina only	0	0	1	0	4	5
Vulva only	5	0	0	1	2	8
Perineum	1	1	2	0	0	4
Anus +/- other sites	0	1	1	1	2	5
Total	12	8	12	7	26	65

among different victim groups. According to Chi-square statistics, a statistically significant number of victims ≥ 14 years of age (248 of 299) were given a firm opinion ($X^2 [1, N = 441] = 56.2, P < 0.001$, no cells had expected frequency < 5) compared to victims who were < 14 years of age. The medicolegal experts were able to provide a firm opinion on victims presenting with complaints of vaginal/anal intercourse (128 of 176) compared to victims presenting with complaints such as intercrural intercourse, fingering, fondling, or multiple complaints (28 out of 85) ($X^2 [1, N = 261] = 37.7, P < 0.001$, no cells had expected frequency < 5). However, it was interesting to note that 126 out of 180 victims presenting mainly due to parental concerns without any direct complaint of SA were given a firm positive opinion confirming alleged SA, which was statistically significant compared to all other presentations. ($X^2 [3, N = 441] = 79.7, P < 0.001$, no cells had expected frequency < 5). When considering the delay in presentation, interestingly, there was no statistically significant difference between different time gaps in presentation between < 12 h and > 72 h and the provision of a firm opinion following medicolegal

examination ($X^2 [5, N = 441] = 9.7, P = 0.86, < 20\%$ cells had expected frequency < 5). The presence of recent or old genital injuries (278 out of 309 with genital injuries) increased the statistical likelihood of being given a firm positive opinion ($X^2 [6, N = 441] = 269.6, P < 0.001, < 20\%$ cells had expected frequency < 5).

DISCUSSION

Expert opinion following medicolegal examination of alleged cases of SA serves as vital evidence at the court of law because often there are no other witnesses in cases such as these. The victim's version of the incident is available against the perpetrator in most instances. Therefore, an objective, unbiased opinion based on scientific evidence is expected from a forensic medical expert to assist in administering justice to both parties involved, the victim and the alleged perpetrator. The medicolegal opinion on penetration based on injuries is considered a critical piece of evidence in the court of law. The expert opinions on consent and other collateral evidence, as well as the time and place of the act, or the circumstance, are the other information required to answer

Table 3: Comparison of genital injuries with the presenting complaint

Category	Parental concern	Vaginal intercourse	Anal intercourse	Intercrural intercourse	Fingering	Fondling	Multiple complaints	Other	Total
Presenting complaint versus presence or absence of genital injuries									
Recent +/- old injuries	11	36	3	1	2	2	10	0	65
Old injuries	119	110	0	4	2	2	4	1	242
Recent vaginal delivery	1	0	0	0	0	0	1	0	2
No fresh injury, cannot exclude old injury	7	6	0	0	1	1	0	0	15
No injuries	42	20	2	17	4	23	6	3	117
Total	180	172	5	22	9	28	21	4	441
Presenting complaint versus recent genital injuries									
Tears	4	15	2	0	0	1	2	0	24
Tears, abrasion/contusion	2	13	1	0	0	0	0	0	16
Abrasion/contusion	5	8	0	1	2	1	8	0	25
Total	11	36	3	1	2	2	10	0	65
Presenting complaint versus findings of hymen									
Recent injuries	5	19	0	1	0	2	1	0	28
Recent injuries + healed	2	9	0	0	1	0	4	0	16
Single healed injury	28	31	0	1	0	0	0	0	60
Multiple healed injuries	1	23	0	1	0	0	2	1	28
Recent vaginal delivery	1	0	0	0	0	0	1	0	2
Attenuated hymen	88	57	1	1	2	2	5	0	156
Dilated with reduced tone	4	2	0	0	0	1	0	0	6
Notch/partial tear	8	6	0	0	1	1	0	0	16
Normal but stretchable	2	0	1	1	0	0	1	0	5
Normal	42	25	3	17	5	5	7	3	124
Total	180	172	5	22	9	28	21	4	441

the three forensic questions arising at the trial; if sexual contact has occurred, if so, with whom, and if it was consensual.^[17] Thus, a forensic medical practitioner records injuries for such interpretations and recovers evidence during forensic medical examination to corroborate or refute the allegation of sexual assault, providing answers to the above questions. Therefore, information derived during the medicolegal examination of a victim of alleged SA is vital for the prosecutors to corroborate a sexual assault, refute the alleged perpetrator's claims of a consensual act, and point out the severity of the incident.^[10,12,19]

The Sri Lankan report on the implementation of the Optional Protocol on the sale of children, child prostitution, and child pornography submitted by Protecting Environment and Children Everywhere/End Child Prostitution and Trafficking (ECPAT) Sri Lanka and ECPAT International identifies Sri Lanka as a source and destination, to a lesser extent, a transit country for trafficking children for sexual exploitation. It further identifies tourism as the primary vulnerable circumstance of child exploitation, although the report does not provide exact statistics.^[20] The Sri Lanka Police reported 5968 cases of rape and SA from 2015 to 2017. Among them, 83% of the cases had been statutory rape and SA against girls/children <16 years of age.^[9] World statistics also state that approximately 1 in 6 boys and 1 in 4 girls are sexually abused before 18 years, highlighting the magnitude of child SA.^[21] Our

study sample also had more child victims, showing a similar trend to global and Sri Lankan national statistics. However, it should be noted that the number of reported cases of SA is universally much lower than the actual number of cases, reflecting the ice-burg phenomenon.^[22-25] Thus, although the reported statistics are already alarming, these numbers could be even higher. Poor legal assistance and social stigma are possible reasons for the inadequate surfacing of such cases, which have been suggested by Alok Atreya, who identifies the need for legal reform in Nepal.^[26]

According to our findings, most SA victims were presented for medicolegal examination late and brought due to guardian concerns but with a direct complaint. Children often refrain from talking about sexual contact either due to fear of negative reactions from their parents or being harmed by the abuser.^[27] Vaginal intercourse was the main presenting complaint except among children between 14 and 16 years of age, who were mainly brought due to the guardian's concerns. Similar studies from Sri Lanka reported that nonpenetrative sex was commonly observed among younger age groups.^[28] A study conducted in the Baltic Sea region also found that indecent touching is a common form of sexual violence against children.^[29]

In our study, most victims alleged that the perpetrator was known to them, and the alleged act was performed by a single

Table 4: Factors affecting the medicolegal opinion

Category	Firm positive opinion	Firm negative opinion	No firm opinion	Total
Opinion versus age (years)				
<12	21	6	49	76
12-<14	34	8	24	66
14-<16	107	18	25	150
16-<18	55	3	3	61
>18	62	2	24	88
Total	280	37	124	441
Opinion versus presenting complaint				
Parental concern	126	35	19	180
Vaginal intercourse	125	1	46	172
Anal intercourse	3	0	2	5
Intercrural intercourse	3	0	19	22
Fingering	3	0	6	9
Fondling	4	1	23	28
Multiple complaints	14	0	7	21
Other	1	0	3	5
Total	280	37	124	441
Opinion versus presence or absence or repeated abuse				
Present	143	0	31	174
Absent/no details	137	36	94	267
Total	280	37	124	441
Opinion versus time elapsed before the presentation				
<12 h	2	1	0	3
12-24 h	20	8	19	47
25-48 h	18	3	13	34
49-72 h	16	2	10	28
>72 h	205	17	80	302
Details not available	18	6	3	27
Total	280	37	124	441
Opinion versus type of genital injury				
Recent +/- old injuries	61	0	4	65
Old injuries	215	3	24	242
Recent vaginal delivery	2	0	0	2
No fresh injury, cannot exclude old injury	1	2	12	15
No injuries	0	32	85	117
Total	280	37	124	441
Opinion versus location of recent genital injury				
Hymen + vagina	43	0	0	43
Vagina only	5	0	0	5
Vulva only	7	0	1	8
Perineum	1	0	3	4
Anus +/- other sites	5	0	0	5
Recent vaginal delivery	2	0	0	2
No recent injuries	216	37	120	376
Total	280	37	124	441
Opinion versus recent genital injuries				
Tears	25	0	0	25
Tears, abrasion/contusion	16	0	0	16
Abrasion/contusion	21	0	4	25
Recent vaginal delivery	2	0	0	2
No recent injuries	216	37	120	376
Total	280	37	124	441
Opinion versus hymenal injuries				
Recent injuries	28	0	0	28
Recent injuries + healed	16	0	0	16

Contd...

Table 4: Contd...

Category	Firm positive opinion	Firm negative opinion	No firm opinion	Total
Single healed injury	55	0	3	60
Multiple healed injuries	11	0	18	29
Recent vaginal delivery	2	0	0	2
Attenuated hymen	156	0	0	156
Dilated with reduced tone	3	0	5	6
Notch/partial tear	1	2	13	16
Normal but stretchable	1	1	3	5
Normal	6	34	83	123
Total	280	37	124	441
Opinion versus pregnancy indicators				
POA +/- positive urine hCG	32	0	0	32
Negative	243	37	124	404
Total	280	37	124	441

POA: Period of amenorrhea, HCG: Human chorionic gonadotropin

person, although repeated incidents were reported. This is a well-known characteristic of child abuse, where studies have revealed that approximately three-quarters of reported cases of child SA are committed by family members or other individuals who are considered part of the victim's "circle of trust."^[30,31] A study on child SA conducted in Sri Lanka also showed that the perpetrator was a male known to the child in 83% of cases.^[28]

Only a minority of the victims who alleged physical threats and resistance during the act had supportive injuries in our study sample. The presence of collateral damage in a woman who alleges SA, such as bruises, cuts, burns, or internal injuries, increases the probability of proving the charge of sexual violence.^[13] According to the Statistics of the Bureau of Justice in the US, 38% of female rape victims sustained other injuries. Thirty-nine percent of attempted rape victims and 17% of sexual assault victims were injured during their alleged assault.^[30] However, our study group had only 9% of victims presenting with collateral injuries, of whom the majority were over 18 years of age. As this study group was mainly composed of children who are unable to resist, and often the sexual act is with unlawful consent, the absence of collateral injuries in a majority is expected.

Recent genital injuries were observed in only a minority of the victims, and most of them had hymenal tears. Furthermore, among the group complaining of vaginal intercourse, only a few had recent injuries and tears to the hymen, while most had old injuries. On the other hand, out of the victims brought due to guardian concerns, with many of them being children, only a few had recent injuries, while most had healed wounds. Most of the injuries observed in our study were cured or recent hymenal tears. The most common locations for genital injury in female teenagers and women following SA are the posterior fourchette, labia minora, hymen, and fossa navicularis.^[32-37] Hymenal and vaginal injuries were commonly observed among adults, whereas younger victims mainly had injuries to the vulva and perineum. This can be attributed to the type of sexual activity associated with children, as revealed in this

study and the published literature.^[29,38] During prepubertal age, bruising, lacerations, abrasions, and swelling caused by acute trauma to the genitalia typically heal without leaving any long-lasting signs on later examination unless it is an extensive laceration.^[39]

The presence of acute genital injuries always directs toward suspicion of SA, especially when the trauma is to the hymen. External genital injuries are considered markers of nonconsensual intercourse.^[13] It has been reported that with direct visualisation, the prevalence of injuries in sexual assault is less than 40%.^[40-44] The type of examination has a significant association with most genital injuries resulting from sexual assault, with 5% detection by direct visualisation to 87% in the colposcopic test.^[34] Thus, the absence of damage does not necessarily exclude the possibility of penetration/sexual action. The examination technique used in the victims in our study was direct visualisation with or without insertion of the Foley catheter.

Complaints of vaginal intercourse repeated SA, and the presence of recent or old injuries was mainly associated with a firm positive opinion. Rambow and colleagues reported that evidence of genital or nongenital injury is related to successful legal outcomes in cases of alleged SA.^[45] We observed that many individuals with a firm positive or negative opinion could not be given. Many of these individuals had only healed or no injuries. A firm opinion could not be provided in a few individuals with recent nonspecific injuries to genitalia, which could be explained by the absence of evidence beyond a reasonable doubt to exclude the possibility of them being accidental. Accidental injuries to genitalia are typically anterior, exterior, unilateral, usually mild, and generally superficial injuries to the external genitalia (typically bruises with hematoma, more rarely cutaneous tears, and very deep, penetrating injury).^[46]

In acts such as intercrural intercourse and fondling, much medical evidence of the alleged act cannot be expected due

to nature. Especially if the victim was brought to medical attention solely due to parental concerns regarding actions such as fondling, one might question the need for medicolegal examination because it may have little value. However, as noted in our study, in a significant number of victims brought due to parental concerns, the forensic experts were able to identify genital injuries, proving a firm positive opinion on the alleged SA and highlighting the importance of thorough medicolegal work-up. On the other hand, forensic experts could also render a firm negative opinion refuting the alleged SA following medicolegal examination in some instances due to parent concerns.

CONCLUSIONS AND RECOMMENDATIONS

Forensic medical examination in alleged SA has a significant role in administering justice. Corroborating or refuting the alleged SA must always be based on opinions and claims supported by scientific evidence. Forensic experts often face many difficulties in diagnosing SA based on ano/genital examination, especially concerning children. This can be primarily attributed to the scarcity of clinical findings on the medicolegal investigation of alleged SA, especially in children, for many reasons, including abuse (such as fondling). Therefore, a “negative” or “absence of positive” examination findings does not exclude the possibility of SA. Many nonspecific findings, such as perineal erythema in children, may be consistent with the fondling or fingering clinical history. Thus, it is more scientific to state that although there is no medical evidence or signs of injury, exclusion of SA is not possible.

On the other hand, the absence of medicolegal findings may be due to the lack of experience of the examiner. Broad knowledge of a range of medical disciplines and sound experience in handling SA cases is necessary to interpret medical evidence in SA forensic examination.

Therefore, it is recommended to have a holistic approach with the involvement of multidisciplinary professionals in SA forensic examination as laid down in the standard operating procedures and guidelines on examining SA survivors. Furthermore, it is recommended to be the minimum standard to have direct supervision of junior medical officers who engage in such examinations to enhance the reliability of the opinion.

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REFERENCES

- García-Moreno C; World Health Organisation, Pallitto C, Devries K, Stöckl H, Watts C, *et al.* Global and Regional Estimates of Violence Against Women: Prevalence and Health Effects of Intimate Partner Violence and Nonpartner Sexual Violence. WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland; 2013. p. 58.
- Borumandnia N, Khadembashi N, Tabatabaei M, Alavi Majd H. The prevalence rate of sexual violence worldwide: A trend analysis. *BMC Public Health* 2020;20:1835.
- Krug EG, Mercy JA, Dahlberg LL, Zwi AB. The world report on violence and health. *Lancet* 2002;360:1083-8.
- Dworkin ER, Krahé B, Zinzow H. The global prevalence of sexual assault: A systematic review of international research since 2010. *Psychol Violence* 2021;11:497-508.
- Sri Lanka. Penal Code (Ordinance No. 2 of 1883). Available from: http://www.ilo.org/dyn/natlex/natlex4.detail?p_lang=en&p_isn=67628. [Last accessed on 2021 Aug 05].
- World Health Organisation, Pan American Health Organization. Understanding and Addressing Violence against Women: Intimate Partner Violence. Report No.: WHO/RHR/12.36. World Health Organisation; 2012. Available from: <https://apps.who.int/iris/handle/10665/77432>. [Last accessed on 2022 Jun 06].
- Black MC, Basile KC, Breiding MJ, Smith SG, Walters ML, Merrick MT, *et al.* National Intimate Partner and Sexual Violence Survey (NISVS): 2010 Summary Report. Atlanta, GA: Centers for Disease Control and Prevention; 2010. p. 124.
- UN Women. Global Database on Violence against Women – Sri Lanka. Global Database on Violence against Women. Available from: <https://evaw-global-database.unwomen.org/fr/countries/asia/sri-lanka>. [Last accessed on 2020 May 08].
- Sri Lanka Police. Sri Lanka Police Crime Statistics. Sri Lanka Police; 2022. Available from: <https://www.police.lk/index.php/item/138-crime-statistics>. [Last accessed on 2022 Jun 06].
- Walker G. The (in)significance of genital injury in rape and sexual assault. *J Forensic Leg Med* 2015;34:173-8.
- McGregor MJ, Du Mont J, Myhr TL. Sexual assault forensic medical examination: Is evidence related to successful prosecution? *Ann Emerg Med* 2002;39:639-47.
- Spohn C, Tellis K. Justice Denied? The Exceptional Clearance of Rape Cases in Los Angeles. Undefined; 2011. Available from: <https://www.semanticscholar.org/paper/Justice-Denied-the-Exceptional-Clearance-of-Rape-in-Spohn-Tellis/5010f314b00564949e6b358115694487b9505a72>. [Last accessed on 2022 Jun 06].
- Sommers MS, Fargo JD. Discriminating between consensual intercourse and sexual assault: Genital-anal injury pattern in females. *J Forensic Leg Med* 2021;79:102138.
- Baker RB, Sommers MS. Relationship of genital injuries and age in adolescent and young adult rape survivors. *J Obstet Gynecol Neonatal Nurs* 2008;37:282-9.
- Jones JS, Rossman L, Diegel R, Van Order P, Wynn BN. Sexual assault in postmenopausal women: Epidemiology and patterns of genital injury. *Am J Emerg Med* 2009;27:922-9.
- Sommers MS, Zink TM, Fargo JD, Baker RB, Buschur C, Shambley-Ebron DZ, *et al.* Forensic sexual assault examination and genital injury: Is skin color a source of health disparity? *Am J Emerg Med* 2008;26:857-66.
- Atherton JR. Oral communication at St Mary's FMERSA course 2014, module 2, block 4. “A judge's view” Wednesday. [Last accessed on 2014 Oct 15].
- Zink T, Fargo JD, Baker RB, Buschur C, Fisher BS, Sommers MS. Comparison of methods for identifying ano-genital injury after consensual intercourse. *J Emerg Med* 2010;39:113-8.
- Alderden M, Cross TP, Vlajnic M, Siller L. Prosecutors' perspectives on biological evidence and injury evidence in sexual assault cases. *J Interpers Violence* 2021;36:3880-902.
- PEACE/ECPAT Sri Lanka and ECPAT International. Supplementary Report on “Sexual Exploitation of Children in Sri Lanka” to the Initial Report of Sri Lanka on the Implementation of the Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography. Thailand: Committee on the Rights of the Child; October, 2018.
- American Psychological Association. Child Sexual Abuse: What Parents Should Know; 2014. p. 8. Available from: <https://abolitionistmom.org/>

- wp-content/uploads/2014/05/Child-sexual-abuse-What-parents-should-know.pdf. [Last accessed on 2021 Aug 05].
22. Finkelhor D. The prevention of childhood sexual abuse. *Future Child* 2009;19:169-94.
 23. Sitorus JC. Victims of sexual abuse: How does the law protect her? *Unnes Law J* 2019;5:2. Available from: <https://journal.unnes.ac.id/sju/index.php/ulj/article/view/29864>. [Last accessed on 2022 Jun 06].
 24. Cantalupo NC, Kidder WC. Mapping the title IX iceberg: Sexual harassment (Mostly) in graduate school by college faculty. *J Legal Educ* 2017;66:850-81.
 25. Jewkes R, Abrahams N. The epidemiology of rape and sexual coercion in South Africa: An overview. *Soc Sci Med* 2002;55:1231-44.
 26. Atreya A, Kanchan T. Legal status on sexual assaults – Is Nepal lagging way behind compared to International law? *Indian J Med Spec* 2017;8:60-3.
 27. Canadian Centre for Child Protection. *Child Sexual Abuse: It Is Your Business* [Internet]. 3rd ed. Manitoba, Canada: Canadian Centre for Child Protection; 2014;16. Available from: cybertip.ca/pdfs/C3P_ChildSexualAbuse_ItsYourBusiness_en.pdf. [Last accessed on 2021 Aug 05].
 28. Rohanachandra YM, Dahanayake DM, Pathigoda PA, Wijetunge GS. Characteristics of victims of alleged child sexual abuse referred to a child guidance clinic of a children's hospital. *Ceylon Med J* 2015;60:163-4.
 29. Mossige S, Svedin CG, Ainsaar M. The Baltic Sea Regional Study on Adolescents' Sexuality. Oslo Metropolitan University – OsloMet: NOVA; 2007. Available from: <https://oda.oslomet.no/oda-xmlui/handle/20.500.12199/4939>. [Last accessed on 2022 Jun 06].
 30. Mulder J, Teunissen TA, Pranger ES, Hiddink-Til A, Lagro-Janssen AL. Reporting after sexual violence: The influence of victim, assault and perpetrator characteristics. *J Forensic Leg Med* 2021;79:102076.
 31. U.S. Department of Health & Human Services Administration for Children and Families Administration on Children, Youth and Families Children's Bureau. *Child Maltreatment 2011*. Washington, D.C.: U.S. Department of Health & Human Services Administration for Children and Families Administration on Children, Youth and Families Children's Bureau; 2012. p. 264. Available from: <https://www.acf.hhs.gov/sites/default/files/cb/cm2012.pdf>. [Last accessed on 2021 Mar 02].
 32. Sommers MS, Schafer J, Zink T, Hutson L, Hillard P. Injury Patterns in Women Resulting from Sexual Assault: Trauma, Violence, & Abuse; June 29, 2016. Available from: <https://journals.sagepub.com/doi/10.1177/1524838001002003003>. [Last accessed on 2020 May 10].
 33. Slaughter L, Brown CR, Crowley S, Peck R. Patterns of genital injury in female sexual assault victims. *Am J Obstet Gynecol* 1997;176:609-16.
 34. Slaughter L, Brown CR. Colposcopy to establish physical findings in rape victims. *Am J Obstet Gynecol* 1992;166:83-6.
 35. Lauber AA, Souma ML. Use of toluidine blue for documentation of traumatic intercourse. *Obstet Gynecol* 1982;60:644-8.
 36. Jones JS, Rossman L, Wynn BN, Dunnuck C, Schwartz N. Comparative analysis of adult versus adolescent sexual assault: Epidemiology and patterns of anogenital injury. *Acad Emerg Med* 2003;10:872-7.
 37. Grossin C, Sibille I, Lorin de la Grandmaison G, Banasr A, Brion F, Durigon M. Analysis of 418 cases of sexual assault. *Forensic Sci Int* 2003;131:125-30.
 38. Adams JA, Farst KJ, Kellogg ND. Interpretation of medical findings in suspected child sexual abuse: An update for 2018. *J Pediatr Adolesc Gynecol* 2018;31:225-31.
 39. McCann J, Miyamoto S, Boyle C, Rogers K. Healing of hymenal injuries in prepubertal and adolescent girls: A descriptive study. *Pediatrics* 2007;119:e1094-106.
 40. Cartwright PS. Reported sexual assault in Nashville-Davidson County, Tennessee, 1980 to 1982. *Am J Obstet Gynecol* 1986;154:1064-8.
 41. Everett RB, Jimerson GK. The rape victim: A review of 117 consecutive cases. *Obstet Gynecol* 1977;50:88-90.
 42. Goodyear-Smith FA. Medical evaluation of sexual assault findings in the Auckland region. *N Z Med J* 1989;102:493-5.
 43. Hayman CR, Lanza C, Fuentes R, Algor K. Rape in the district of Columbia. *Am J Obstet Gynecol* 1972;113:91-7.
 44. Massey JB, Garcia CR, Emich JP Jr. Management of sexually assaulted females. *Obstet Gynecol* 1971;38:29-36.
 45. Rambow B, Adkinson C, Frost TH, Peterson GF. Female sexual assault: Medical and legal implications. *Ann Emerg Med* 1992;21:727-31.
 46. Herrmann B, Banaschak S, Csorba R, Navratil F, Dettmeyer R. Physical examination in child sexual abuse. *Dtsch Arztebl Int* 2014;111:692-703.