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Pattern of Injuries in Cases of Sexual Assault and Role of Colposcopy in Detection of Hidden Injuries

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Abstract

Background: Violence against women and children involves any violent gender-based action resulting in sexual, physical, or psychological injury or suffering to the victims. **Aim of the Work:** To study the pattern of sexual assaults of females in all ages and only children males to evaluate the role of colposcopy in their examination. **Patients and Methods:** 150 cases were and divided into two groups according to age: group A juniors below 18 years, group B above 18 years. **Results:** The age of the cases ranged from 1– 40 years old, 96 were females while 54 were males. Incest was detected in 44 cases, physical injuries in 41 cases & threat in 72 cases. Regarding the type of sexual assault, penile anal penetration was common in age group (A) while penile vaginal penetration was common in age group (B). Ano-genital injuries were detected in 22 cases by naked eye examination and in 88 by colposcopic examination. Addition of toluidine blue dye couldn't detect any extra-injuries. Vaginal and rectal swabs were done only in 41 cases, 17 of them were positive for seminal stain. For these 17 confirmed cases, 9 of them showed positive results during colposcopic examination. In 63 cases, who preserved their clothes without washing, 34 of them were positive for seminal stain detection. **Conclusion:** There are potential variations in the distinctions of sexual assault cases between both sexes and between adults and juniors. The colposcope appears to be an acceptable invasive approach to examine pediatrics and adults in case of suspected sexual abuse.

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Key words Sexual Assault; Colposcopy; Vaginal injuries; Anal injuries

Introduction

According to the United Nations (UN), violence against women is defined as "any act of gender-based violence that causes, or is likely to cause, physical, sexual, or mental harm or suffering to women, including threats of such acts, coercion, or arbitrary deprivation of liberty, whether occurring in public or in private life" (Mathews & Collin, 2019).

Sexual violence indicates any sexual action, endeavor to a sexual action, or other action directed against sexuality of a person using coercion, by any individual regardless of their correlation to the victim, in any setting. It involves rape, which is the physical penetration of penis, other parts of the body or object by force to the anus or vulva (WHO, 2013).

History taking, medical examination and forensic examination are not the only tools we use. X-rays, CT scans, and/or ultrasounds are just a few of the diagnostic procedures that the patient can need, depending on the type of assault and the extent of the injuries received. Furthermore, it could be necessary to gather several specimens for medical testing (e.g. pregnancy, Sexual Transmitted Infections (STIs)). Because medical specimen collection methods vary greatly throughout jurisdictions, the proper tests and specimens should be determined case-by-case (Subramanian & Green, 2015).

Light and magnification are necessary when inspecting the genital tract of victims of sexual assault. The colposcope better fulfills such requirements compared to other methods that have been tried, with ability to clarify the difference between the unusual radial lines and anal fissures (Leeson et al.,2014).

High-quality photos make it possible to discuss results with colleagues and give them more time and attention than is typically possible with subjective analysis (Henry and Flynn 2019).

Examining cases of acute rape and child sexual abuse using toluidine blue is a useful tool. Even though it is suggested as a tool for less experienced medical professionals, specialists can also greatly benefit from it. It is safe for human in vivo use. In terms of medico-legal management, it does not obstruct biological evidence and, despite the possibility of a stinging sensation, it has no long-term negative effects (Hirachan, 2019).

Aim of the Work

This work aimed to evaluate the pattern of the sexual assaults of females and pediatrics who were presented to "Violence against Woman and Child Clinic" in the Forensic Medicine Authority in Egypt (EFMA). It also aimed to evaluate the efficacy of different methods used in visualization of ano-genital injuries during

examination of cases of sexual assault, using naked eye examination, colposcopic examination and colposcopic examination combined with toluidine blue dye.

Patients and Methods

Subjects:

This study is a prospective cohort study, including 150 cases of sexual assault referred to "Violence Against Woman And Child Unit" -Forensic Medicine Authority in Cairo - Ministry of Justice (EFMA) during the period from the first of April 2022 till the first of October 2022.

Inclusion criteria;

Female cases with a recent history of sexual assault less than two weeks, with persecutor or court permission, and child male cases with a recent history of sodomy.

Exclusion criteria;

Female cases referred during menstruation or pregnancy, cases with a history of sexual assault more than two weeks.

Cases were divided into two groups according to age: group A: juniors below 18 years, group B: above 18 years.

History taking:

History taking which includes name, demographic data (age and sex), occupation, residence, marital state, and previous diseases. Detailed history of assault including time, type of act, used instruments, site, the motivation behind the violence, sites of injuries, the relation with the assailant and post-incident of the event. History of treatment and management. All reports of treatment, management, and investigations were analyzed in comparison to the history of attack.

General Examination:

The examination should be in a secure and close clinic without interruption and with good eye contact with the victims. Interviewing the victims about the assault, asking them to tell their own words about what happened without unnecessary interruption then get all available data about medical records, police reports, and court or persecutors decision including the police questioning of the victims. In cases of the minor victims, we asked their parents or family members to relieve their fears and to be in good contact with them.

The complete history is followed by forensic medical examination. Every case was carefully examined and investigated according to the medico-legal sheet approved by the head of the EFMA. During the examination, the victim is undressed and stands on a white sheet to perform the external examination after recording their vital signs for evidence of general violence. Examination of the body for bruises, abrasions, bites, stab wounds, firearm wounds, strangulation marks, smothering marks, multiple traumas, with the examination of body hair by a disposable comb for any retained hair from the assailant.

Local Examination:

Traditional method:

Naked eye examination of local injuries, inner aspects of both thighs, genital injuries and anal injuries.

Recent method:

Colposcopic examination: perineum, hymen, vagina and anus for any tear and bruises and by using disposable plastic Casco in adult non – virgin victims only. Colposcopic examination with addition of Toluidine Blue Dye.

In 2016, Violence Against Woman and Child Unit started using Video colposcope for examination of anogenital area, as a cooperation protocol with United Nations Office on Drugs and Crime (UNODC) and EFMA. A German manufactured microscope from Karl Kaps, including camera with straight and inclinable oculars, inter-changeable objective lenses, five-step magnification zoom, fitted with a secondary observation system, with working range 250-350 min digital camera with lens zoom (3- 20 x), video system with autofocusing options. The Camera has green filter electronically, enabling capillaries and vessels to be viewed with great accuracy with high intensity super bright led ring 5800 k illumination light in addition to USB 3.0 grabber, photos 1/2/4, 25 frames at 1920 x 1080 resolution monitor, swing arm stand and freezing field of image displayed with image field memory *(KAPS Colposcope, 2019).*

Investigations:

Vaginal and anal swabs were taken from those presented within 5 days after assault on special trial swabs and dried at room temperature, then sealed in special tubes with a complete chain of custody (Case number- victims name- doctor name - site of swab- date - time - referral point - stamp for sealing) then referred to the forensic laboratory to be investigated for detection of seminal stains.

The victims were referred to toxicological lab to collect blood and urine samples, to be submitted for toxicological analysis, including broad screening analysis methods for major classes of drugs facilitating sexual assault (alcohol, opiate, amphetamine, barbiturates, cannabinoids, benzodiazepines, antidepressants and anti-psychotic drugs), only for cases referred within five days from the assault with history of suspected unknown substances facilitating the sexual assault *(Alderden et al., 2018).*

Examination of the whole body for trauma and clothes for biological fluids by using UV light then, the clothes referred to the lab to be investigated for biological fluid and photography documentation with colposcopy *(Lincoln, 2018)*.

Ethical Consideration:

Approved from EFMA and Ethical Committee of Faculty of Medicine, Ain Shams University was obtained and valid consent was constructed and fulfilled for every case (No. FWA 000017585).

Statistical Analysis

The results were recorded, tabulated and statistically analyzed by excel system and statistical package for social sciences version 17. 0 (SPSS) to show the relationship between each variant and the other in cross tables. Student t-test and Chi-square were done to show the degree of significance of the results. P-Value was considered to be statistically significant if $\leq$ P 0.05.

Results

This prospective cohort research involved 150 medico-legal cases of sexual assault. The age range of the included cases was 1 year to 40 years with a mean value 15.5 ± 7.8, 96 were females while 54 were males, who were examined at the EFMA - Cairo, from the April 2022 to the first of October 2022.

Socio-demographic characteristics (age and gender) of sexual assaulted cases

Table (1) show that out of the 150 cases included in the study. 124 cases were in Group A (below 18 years), representing 82.7% of the cases. Group B (from 18 years to 40 years), consisted of 26 cases (17.3%).

Table (2) show that, the 96 female cases were distributed among the 2 studied groups as follow: 70 females in the group (A), representing (72.92%) of this group cases, and 26 cases in group (B), representing (27.08%) of this group cases.

This table shows that there is a statistical significant difference between the different age groups of male and female victims (table 2).

Regarding the cases of incest, and the relation of assailants to victim's sex of the present study, table (3) shows that, out of the 16 cases, where the assailant was the father, 15 victims were females and only one male. For the cases where the uncle was the assailant, 7 victims were females and 3 were males. Regarding the 8 cases claimed that their brothers assaulted them, 6 of the victims were females and 2 were males. The 7 reported cases where the assailant was the caregiver, 2 of them were female victims and 5 were males. The last 3 cases where the step father was claimed to be the assailant, 2 of them were females and only 1 was male victim.

This table shows that there is a statistical significant difference between the genders of the victims regarding the type of the assailant in cases of incest (table 3).

Table(4) shows that, 31 cases of incest were found in group (A) < 18 years, where there were 10 cases (32.26%) assaulted from the uncle, 11 cases (35.48%) from the father, 3 cases (9.68%) from brother also 3 cases (9.68%) from stepfather and 4 cases (12.90%) from other relatives. while, in age group (B) from 18 up to 40 years old, there were 13 cases of incest; there were 5 cases (38.46%) from the father, 5 cases (38.46%) from brother and 3 cases (23.08%) from other relatives.

This table shows that there is a statistical significant difference between the different age groups of the victims regarding the type of assailant in cases of incest (table 4).

According to the relation of the examined physical injuries and sex of the victims, table (5) shows that the 41 cases were distributed as 29 female cases and 12 male cases. Out of the 29 females, 14 cases (48.28%) had abrasion marks, 9 cases (31.03%) had contusions, 5 cases (17.24%) had laceration wounds and only 1 case (3.45%) had a fracture in upper limb.

While the 12 male victims, there were 4 cases (33.33%) had abrasion marks, 7 cases (58.33%) had contusions and only 1 case (8.33%) had laceration wound (table 5).

This table shows that there is no statistical significant difference between the gender of the victims regarding the different types of injuries (table 5).

Regarding the distribution of injuries in different age groups, (table 6) shows that, 15 cases were from group (A) and 26 cases were from group (B).

The 41 cases were distributed as follow: 15 cases of group (A), 11 cases (73.33%) had abrasion marks, 1 case (6.67%) had contusions, 3 cases (20%) had laceration wounds (table 6).

While for the 26 cases of group (B), there were 7 cases (26.92%) had abrasion marks, 15 case (57.69%) had contusions, 3 cases (11.54%) had laceration wound and only 1 case (3.85%) had fracture limb (table 6).

This table shows that there is a statistical significant difference between the age groups of the victims regarding the different types of injuries (table 6).

As regard the age groups, table (7) shows that 5 cases (17.86%) in the age group (A) had injured in the head while 3 cases (10.71%) had it in face and neck, 2 cases (7.14%) in the chest and abdomen, 8 cases (28.57%) had the injuries in the thigh and 10 cases (35.71%) had the injuries in the extremities, while in the age group (B), there were 2 cases (15.38%) had the injuries in the head, only 1 case (7.69%) in the face and neck, 3 cases (23.08%) in the chest and abdomen, 5 cases (38.46%) had the injuries in the thigh and 2 cases (15.38%) injured in the extremities.

This table shows that there is no statistical significant difference between the different age groups regarding the site of injury (table 7).

Different types of threat in sexual assault

Tables (8,9) show that according to the sex of victims, the number of the cases had a threat was 72 cases, 48 female cases who constituted (50%) of all female cases versus 24 male cases (44.44%) of all male cases. While regarding the age 53 cases (42.74%) were in category (A) and 19 cases (73.08%) in category (B) faced threat.

Table(8) shows that there is no statistical significant difference between the sex of the victims faced the threat in this study. While table(9) shows that there is a statistical significant difference between the age group of the victims faced the threat in this study.

Table (10) shows the type of the threat, there were 4 male cases (16.67%) had been emotionally threated in comparison to 13 female cases (27.08%), while 10 male cases (41.67%) had been threatened by a sharp object in comparison to 13 female cases (27.08%). On the other hand, there was some assailants used the gun as a method for the threat in 4 male cases (16.67%) and 11 female cases (22.92%). There were 6 male victims (25%) had been threatened by blunt trauma in comparison to 11 female cases (22.92%).

This table shows that there is no statistical significant difference between the sex of the victims regarding the type of threat (table 10).

Table (11) shows that in age group (A), 19 cases were mostly threatened by assailant using a sharp object (35.85%) followed by blunt trauma threat 12 cases (22.64%), then emotional and using gun threat were equally used in this group in 11 cases (20.75%) for each type. In the other group (B), The most common type of threat was emotional threat in 6 cases (31.58%), followed by blunt trauma as a threat in 5 cases (26.32%). In the other types: sharp object and gun threat used were in 4 cases (21.05%) for each type.

This table shows that there is no statistical significant difference between the age group of the victims regarding the type of threat (table 11).

Different types of sexual assault

Table (12) shows different forms of sexual assault in female victims. There were 46 cases (47.92%) had penile-vaginal penetration, 25 cases (26.04%) displayed penetration via penile-anus, 14 cases (14.58%) exhibited digital penetration of vagina and 7 cases (7.29%) had digital anal penetration. 42 cases of all female cases (43.75%) exposed to the attacker's ejaculation. In males, 39 cases (72.22%) had penile-anal penetration and 7 cases (12.96%) had digital anal penetration. 22 male cases (40.74%) were positive for assailants ejaculation.

This table shows that there is a statistical significant difference between the sex of the victims regarding the forms of sexual assault (penile vaginal penetration, penile anal penetration and digital vaginal penetration) (table12).

Table (13) shows that the major sexual assault type in age category (A) was penetration through penile-anus in 59 cases (47.58%) followed by penile-vaginal penetration in 33 cases (26.61%). In the age category (B), there were 13 cases (50%) of penile-vaginal route followed by 5 cases of penile-anal route (19.23%). There were 51 cases (41.13%) positive for attacker ejaculation in age category (A), and it was positive in 13 cases (50%) in category (B).

This table shows that there is a statistical significant difference between the age group of the victims regarding the forms of sexual assault (penile vaginal penetration and penile anal penetration) (table 13).

LOCAL EXAMINATION OF ANO-GENITAL INJURIES:

Naked eye and colposcopy examination

As regards the different methods of examination used in sexual assault cases, all the 150 cases were examined by naked eye examination and with colposcope.

Table (14) shows that, out of the 150 cases, 22 cases (14.67%) showed positive findings for sexual assault by naked eye examination. 88 cases (58.67%) showed positive findings for sexual assault after colposcopic examination. 62 cases were both negative for the naked eye and colposcopic examination, representing (41.33%) of the cases.

Colposcopic examination with addition of Toluidine blue:

62 cases were examined by colposcope and showed negative results. Then the cases were extra examined by addition of toluidine blue. The examination reveled negative findings for the total number of 62 cases, including 14 male cases (22.5%) and 48 female cases (77.5%)

INVESTIGATIONS:

As regards the different types of samples examination:

Table (15) shows vaginal and rectal swabs: only in reported cases of assault within one week. 41 cases out of the total 150 (27.33%) were examined. On microscopic examination, 17 cases (41.46%) were positive for seminal stain while 24 cases (58.53%) were negative.

This table shows that, for these 17 confirmed cases, 9 of them (39.13%) showed positive results during colposcopic examination and 8 cases (44.44%) were negative. For the 24 seminal stain negative cases, 14 cases (60.87%) were positive on colposcopic examination and 10 cases (55.56%) were both negative (table 15).

These results showed that, 23 positive cases examined by the colposcope were confirmed by the seminal stain microscopic examination (table 15).

This table shows that there is no statistical significant difference between negative and positive colposcopic examination regarding the results of vaginal and rectal swabs (table 15).

Table (16) shows Clothes stains*:* Only for cases who preserved their clothes, worn during the assault without washing*,* 63 samples were referred to the lab for seminal examination. 34 samples (53.97%) were positive for detection of seminal stain of the assailant, while 29 cases (46.03%) were negative for microscopic examination.

This table shows that, for these 34 confirmed samples, 23 of them (58.97%) showed positive results during colposcopic examination and 11 cases (45.83%) were negative (table 16).

For the 29 seminal stain negative clothes samples, 16 cases (41.03%) were positive on colposcopic examination and 13 cases (54.17%) were both negative. These results showed that, 39 positive cases examined by the colposcope were confirmed by the seminal stain microscopic examination of the victim’s clothes (table 16).

This table shows that there is no statistical significant difference of results of clothes examination and colposcope examination (table 16).

Table 1: The age distribution of the studied cases of sexual assault referred to" Violence Against Woman And Child Unit":

Age group	No.	%
Group (A) 1 < 18 ys	124	82.67
Group (B) ≥ 18 - 40 ys	26	17.33
Total	150	100.00

Y: year(s), No.:number, (%): percentage.

Table 2: The demographic characteristics of the studied cases of sexual assault regarding age group in relation to sex:

Age	Sex			
	Male (N=54)		Female (N=96)	
	N	%	N	%
Group (A) (n=124)	54	100.00	70	72.92
Group (B) (n=26)	0	0.00	26	27.08
Total (n=150)	54	100.00	96	100.00

N.:number, (%): percentage.

Table 3: Chi-square statistical analysis of the different relationships of assailants in sexual assaulted cases according to sex groups:

Type of assailant (n=44)	Sex				Chi-Square	
	Male (N=12)		Female (N=32)			
	N	%	N	%	X^2	P-value
Father (n=16)	1	8.33	15	46.88	10.560	0.032*
Uncle (n=10)	3	25.00	7	21.88		
Brother (n=8)	2	16.67	6	18.75		
Caregiver (n=7)	5	41.67	2	6.25		
Step father (n=3)	1	8.33	2	6.25		
Total	12	100.00	32	100.00		

N.:number, (%): percentage, X^2 : chi square, *: significant.

Table 4: Different relationships of assailant in incest sexual assaulted cases according to age:

Relationships of assailant (n=44)	Age				Chi-Square	
	Group (A) 1-18 y (n=31)		Group (B) 19-40 y (n=13)			
	N	%	N	%	X^2	P-value
Uncle (n=10)	10	32.26	0	0.00	10.244	0.037*
Father (n=16)	11	35.48	5	38.46		
Brother (n=8)	3	9.68	5	38.46		
Step father (n=3)	3	9.68	0	0.00		
Other relative (n=7)	4	12.90	3	23.08		
Total (N=44)	31	100.00	13	100.00		

Y: year(s), N.:number, (%): percentage, X^2 : chi square, *: significant.

Table 5: Different types of physical injuries in sexual assaulted cases in relation to sex:

Type of injury	Sex				Chi-Square	
	Male (n=12)		Female (n=29)			
	N	%	N	%	X^2	P-value
Abrasion	4	33.33	14	48.28	2.927	0.403
Contusion	7	58.33	9	31.03		
Laceration	1	8.33	5	17.24		
Fracture	0	0.00	1	3.45		
Total	12	100.00	29	100.00		

N.:number, (%): percentage, X^2 : chi square.

Table 6: Different types of physical injuries in sexual assaulted cases in relation to age:

Type of injury	Age				Chi-Square	
	Group A (n=15)		Group B (n=26)			
	N	%	N	%	X^2	P-value
Abrasion	11	73.33	7	26.92	12.055	0.007*
Contusion	1	6.67	15	57.69		
Laceration	3	20.00	3	11.54		
Fracture	0	0.00	1	3.85		
Total	15	100.00	26	100.00		

*N.:number, (%): percentage, X^2 : chi square, *: significant.*

Table 7: Distribution of the different types of physical injuries in sexual assaulted cases in relation to age:

The site of physical injury	Age				Chi-Square	
	Group (A) (n=28)		Group (B) (n=13)			
	N	%	N	%	X^2	P-value
Head	5	17.86	2	15.38	3.491	0.479
Face and neck	3	10.71	1	7.69		
Chest and abdomen	2	7.14	3	23.08		
Thigh	8	28.57	5	38.46		
Extremities	10	35.71	2	15.38		
Total	28	100.00	13	100.00		

N.:number, (%): percentage, X^2 : chi square.

Table 8: The demographic characteristics of the studied group cases as regards the threat in relation to sex:

Threat	Sex				Chi-Square	
	Male (N =54)		Female (N =96)			
	N	%	N	%	X^2	P-value
Yes (n=72)	24	44.44	48	50.00	0.234	0.629
No (n=78)	30	55.56	48	50.00		
Total	54	100.00	96	100.00		

N.:number, (%): percentage, X^2 : chi square.

Table 9: The demographic characteristics of the studied group cases as regards the threat in relation to age group:

Threat	Age Group				Chi-Square	
	Group (A) (N =124)		Group (B) (N =26)			
	N	%	N	%	X^2	P-value
Yes (n=72)	**53**	**42.74**	**19**	**73.08**	**6.755**	**0.009***
No (n=78)	**71**	**57.26**	**7**	**26.92**		
Total	**124**	**100.00**	**26**	**100.00**		

*N.:number, (%): percentage, X^2 : chi square, *: significant.*

Table 10: The demographic characteristics of the studied cases as regards the different types of threat in relation to sex:

Types of Threat (n=72)	Sex				Chi-Square	
	Male (N =24)		Female (N =48)			
	N	%	N	%	X^2	P-value
Emotionally (N=17)	4	16.67	13	27.08	2.130	0.546
Sharp object (N=23)	10	41.67	13	27.08		
Gun (N=15)	4	16.67	11	22.92		
Blunt trauma (N=17)	6	25.00	11	22.92		
Total	24	100.00	48	100.00		

N.:number, (%): percentage, X^2 : chi square.

Table 11: The demographic characteristics of the studied cases as regards the different types of threat in relation to age group:

Types of Threat (n=72)	Age				Chi-Square	
	Group (A) (N =53)		Group (B) (N =19)			
	N	%	N	%	X^2	P-value
Emotionally (N=17)	11	20.75	6	31.58	1.733	0.630
Sharp object (N=23)	19	35.85	4	21.05		
Gun (N=15)	11	20.75	4	21.05		
Blunt trauma (N=17)	12	22.64	5	26.32		
Total	53	100.00	19	100.00		

N.:number, (%): percentage, X^2 : chi square.

Table 12: The different forms of sexual assault in relation to sex:

Forms of sexual assault	Sex				Chi-Square	
	Male (n=54)		Female (n=96)			
	N	%	N	%	X^2	P-value
Penile vaginal penetration (n=46)	0	0.00	46	47.92	35.100	<0.001*
Penile anal penetration (n=64)	39	72.22	25	26.04	28.272	<0.001*
Digital Vaginal penetration (n=14)	0	0.00	14	14.58	7.048	0.008*
Digital anal penetration (n=14)	7	12.96	7	7.29	0.729	0.393
Ejaculation (n=64)	22	40.74	42	43.75	0.035	0.853

*N.:number, (%): percentage, X^2 : chi square, *: significant.*

Table 13: The different forms of sexual assault in relation to age group:

Forms of sexual assault	Age				Chi-Square	
	Group A (n=124)		Group B (n=26)			
	N	%	N	%	X^2	P-value
Penile vaginal penetration (n=46)	33	26.61	13	50.00	4.484	0.034*
Penile anal penetration (n=64)	59	47.58	5	19.23	5.950	0.015*
Digital Vaginal penetration (n=14)	12	9.68	2	7.69	0.003	0.957
Digital anal penetration (n=14)	14	11.29	0	0.00	2.041	0.153
Ejaculation (n=64)	51	41.13	13	50.00	0.376	0.540

*N.:number, (%): percentage, X^2 : chi square, *: significant.*

Table 14: The role of colposcopy in injury detection in sexual assault cases examination:

Type of examination method	Results			
	Positive Findings		Negative Findings	
	N	%	N	%
Naked eye examination	22	14.67	128	85.33
Colposcope examination	88	58.67	62	41.33

N.:number, (%): percentage.

Table 15: Results of examination by vaginal and rectal swabs:

Cases Examined (in first week)	Colposcope Examination				Chi-Square	
	Positive Cases (N=23)		Negative Cases (N=18)			
	N	%	N	%	X^2	P-value
Positive Cases for seminal stain (n = 17)	9	39.13	8	44.44	0.001	0.981
Negative Cases for seminal stain (n = 24)	14	60.87	10	55.56		
Total (n=41)	23	100.00	18	100.00		

N.:number, (%): percentage, X^2 : chi square.

Table 16: Results of clothes examination:

Cases Examined for clothes	Colposcope Examination				Chi-Square	
	Positive Cases(N=39)		Negative Cases(N=24)			
	N	%	N	%	X^2	P-value
Positive Cases for seminal stain (n = 34)	23	58.97	11	45.83	0.572	0.450
Negative Cases for seminal stain (n = 29)	16	41.03	13	54.17		
Total (n=63)	39	100.00	24	100.00		

N.:number, (%): percentage, X^2 : chi square.

Discussion

Based on the perspective of forensic intervention, few nations have officially adopted evidence management guidelines in sexual assault victims. However, such guidelines may differ within the same country between different institutions and regions (Connery, 2013). However, forensic medicine examination standardization of sexual assault sufferers and the credibility of forensic practices, which are necessary during judgment, adoption of clear guidelines by the scientific community is needed. Such guidelines will facilitate a timely and thorough forensic review by reducing needless variances in the procedures and maximizing forensic intervention. They will also improve communication among various organizations and professions (Magalhães et al., 2015).

Taking this in mind, this study aimed to assess children and females sexual assaults pattern. The study also objected at evaluation of the efficacy of different methods used in visualization of ano-genital injuries during examination of cases of sexual assault, using naked eye examination, colposcopic examination and colposcopic examination combined with toluidine blue dye.

The current study included 150 patients, who attended the newly founded unit of the violence against woman and child in the Forensic Medicine facility in Cairo which cover from the first of April 2022 to the first of October 2022.

Out of the 150 cases, the majority were below 18 years (124 cases; 82.67%), and the remaining were above 18 years, ranging between 18 and 40 years. Relatedly, the present work displayed that more than half of females (72.92%) aged below 18 years. this emphasizes the children vulnerability and the higher susceptibility to sexual abuse.

The findings of present study are aligning with the recent report of Ross (2021), which has released that most sexual assault cases were below 19 years old. The frequency of individuals under 18 years in Egypt was 38 million in 2017, representing 40.1% of total population (CAPMAS, 2017). They are vulnerable to various types of adverse childhood experiences (ACEs) involving many forms of neglect, abuse, and maltreatment with child protection remaining greatly un-addressed (Sealey, 2015). A previous Egyptian study conducted in 2012 to investigate the nature and extent of child abuse, revealed some alarming statistics; the total prevalence of sexual abuse was 29.8% (Aboul-Hagag & Hamed, 2012). Nonetheless, such statistics require cautious interpretation as it enrolled students in a single university not a national sample, and the frequencies speak to the potential of the problem and highlight particularly high-risk populations.

This research displayed dominancy of females as victims of sexual abuse, and they constituted about two thirds of cases (64%). This agrees with the literature evidence of female predominance in sexual assault victimization. Variable degrees of female contribution as a sexual assault victim were documented. However, they all shared being the predominant gender.

A systematic review conducted by Moreno (2013) found that, consideration most of the published studies revealed that proportion of females involved in sexual violence exceeded 90%. It was also declared that the number of female victims of sexual assault recorded by police was five times more than male victims (Ross, 2021). McKillop et al. (2015) reported that females were approximately three times more likely than males to be sexual assault victims (72 vs 28%). In Egypt, Abd El Rahman et al. (2017) found that feminine gender was more dominant compared to males (52.8%).

The actual frequency of the various types of sexual assault on women varies from location to location. The available statistics are derived from various populations through a range of sexual violence metrics, and the accuracy of the data is impacted by non-reporting. Depending on a number of factors, demographic characteristics can change throughout cultures and between different regions within a same nation (El-Elemi et al., 2011).

According to police investigations, victims and persecutors statements, the studied cases were assaulted by assailants with variable degrees of relationships. Most of the incriminated perpetrators of sexual assault were individuals outside the victim's families (70.67%), while only (29.33%) were victim's relatives. Of the relatives, fathers were incriminated in (10.67%) of cases, uncles in (6.67%), brothers in (5.33%), caregivers in (4.67%), and stepfathers in (2%).

This result is in agreement with AlMadani et al. (2012) and Abd El Rahman et al. (2017) studies, those discovered strangers as the most predominant perpetrators of sexual assault in Saudi Arabia and in Egypt respectively. Nonetheless, several researches proposed that perpetrators of children predispose to be recognized by their victims. Specifically, the study of Planty et al. (2013) announced that 22% of the assaults were performed by a stranger, while 78% were done by an individual known to the victim. It is thought, therefore, that the official numbers only account for a small portion of genuine sexual assaults.

Regarding the cases of incest of the present study, in most of the cases where the assailant was the father (46.88%), the victims were females (15 out of 16). This was shown also for uncle (21.88%), brother (18.75%), and the stepfather (6.25%), while the majority of cases assailed by the caregiver were males (41.67%).

The prevalence of female gender in most cases of intra-family sexual assault is to some extent was expected due to the overall female prevalence of the study cases. On the other side, male prevalence as a victim of sex assault by caregivers seems to be out of the study trend. In any child protection service rendered by hospital or non-governmental facility, services usage is more by female cases than males(Macionis & Plummer, 2012). Therefore, in cases of male children, the iceberg phenomenon of child abuse—of which we only see the tip—is even more hidden, and it's possible that we never see it at all.

While familial abuse is terminated by marriage and many cases of female child sexual abuse are unintentionally discovered owing to pregnancy, boys appear to have a lower disclosure rate, and unintentional disclosure becomes more uncommon, leading to years of torture (Subramaniyan et al., 2017).

The present study showed that most of the intra-family sexual assault victims were below 18 years old. This is partially due to that most of the study cases in general were below 18 years. In addition this could be explained by that this is the age of person vulnerability and highest dependence on family, which facilitates the assailant violation.

In the current work, it was shown that 41 cases presented with manifestations of physical violence either abrasions (44%), contusions (39.2%), lacerations (14.63%) or even fracture which was seen in one case (2.44%). Sexual assault victims may have visible wounds as a result of resistance or unintentional injuries sustained during the assault, these figures are comparable to what was documented by Moreno (2013), that 30.6% of the cases had evidenced physical trauma based on forensic checkup. These figures also support results by prior researches that reported the large majority of sexual assault cases have negative physical findings (Herrmann et al., 2014; Abd El Rahman et al., 2017).

On the other side, some data reported evidence of physical injury from 39%-70% (Jänisch et al., 2010). Due to the larger proportion of minor victims in our sample, overall data may be lower in this study than in previous studies. Even yet, since some sexual behaviors—like orogenital contact and harassment—rarely cause bodily harm, the lack of good results does not rule out the likelihood of sexual abuse. It is also possible for the anus or labia to pierce without causing harm, but not the hymen.

Furthermore, in situations where the mucous membrane is elastic and can be stretched without causing harm, genital injuries might not be visible. Furthermore, the victims can have examinations a few days following the abuse, which could result in the healing of genital sores (Abd El Rahman et al., 2017).

No significant differences were noted between males and females in the incidence of physical injury (12 male cases & 29 female cases), or in the distribution of different injury types (p=0.403).

This is in consistence with the results of Mwaheb (2016) who found no significant difference between both sexes in the frequency of physical injury associated with sexual assault.

The present study revealed significant differences between both age categories in the incidence of physical injury (p=0.007). From the overall number of cases over 18 years, 26 cases had evidence of physical harm, while from those below 18 years, only 15 cases showed physical injury signs.

This is in line with Moreno (2013), who reported that risk for physical harm elevates considerably with age, with near doubling the risk.

As regards the site of the physical injuries, the current study showed that the highest percentage of injury was in thigh (31.71%), followed by extremities (29.27%), head (17.07%), chest and abdomen (12.20%), and face and neck (9.76%).

This means that limbs were the most frequently encountered parts of physical injury (60.98%). This is in line with sexual assaults, as perpetrators frequently target these areas to weaken victim's resistance. The study of Abd El Rahman et al. (2017), in agreement with the findings of present study; they found that the most common site of injury in sexual assault victims was limbs (49.6%), followed by head (23.1%).

Regarding the site of injury, the present study found no significant difference between age groups, while significant difference was evident (p=0.022) between both sexes.

This difference reflects the different assault types, as males assaulted through anus, this could explain the confinement of injury at limbs and head as these are the sites where assailant try to fix the victim.

In the present study, about half of the cases underwent threat for sexual assault (72 cases), with no significant difference between both sexes in undergoing threat (p=0.629). Significantly higher percentage of those undergoing threat were found in the above 18 years age group. The types of threat were sharp object (21.05%), emotional threat (31.58%), blunt trauma (26.32%) and gun (21.05%), with no significant difference in the distribution of the threat types either between both sexes or between both age groups.

In agreement with the current work, it was reported that 50% of perpetrators who assaulted female victims used some degree of physical force, 17% threatened to ruin the victim’s reputation, and 12% threatened to physically harm the victim (Rock, 2013). In another report, between 18% and 21% of perpetrators exclusively used force or the threat of force, between 39% and 46% reported relying only on alcohol or drugs to perpetrate the assault (Greathouse et al., 2015). The significant higher prevalence of physical injury in victims aged more than 18 years could be explained by that older age is associated with higher recognition of the sexual act and its consequences, together with the higher physical ability in this age group, yield to higher resistance to the assailant and hence higher chance to get injured.

In this study, sexual assault associated with penetration represented 92% of the cases. Significant difference was noticed between both sexes in the prevalence of penetration (85.18% in males vs. 95.83% in females). The percentages of the assaults with penetration were shown to decrease with the age of victim; 95.16% in victims below 18 years and 76.92% in victims above 18 years. The most common type of penetration in the age group below 18 years was penile-anal (47.58%), followed by penile-vaginal penetration (26.61%). While in the age category above 18 years, the most common type was penile-vaginal penetration (50%), followed by penile-anal penetration (19.23%). This is likely attributed to that all the males victims, whom were assaulted anally, were in the below 18 years group, while all the above 18 years

victims were females, and they are more likely to be assaulted vaginally.

Such results are going with the work of Alaa El-Din et al. (2019), that revealed that the major common form of sexual assault penetration in cases aged below 18 years was penile-anal followed by penile-vaginal penetration, whereas in the older age category (above 18), the most common type was penile-vaginal followed by penile-anal penetration. They, in match with the findings of present study, also found that no significant difference between both sexes in the prevalence of penetration, and that the prevalence decreased in the older age group.

The present study findings are matching also with the study of Abo-Seria et al. (2019), which was conducted in Cairo, Egypt. The authors demonstrated that anal assault (55%) was the most reported form of child sexual abuse, followed by penetration of the vagina (33.5%). The research performed by Metwaly et al. (2013) and Elgendy & Hassan (2013) in Quena and Greater Cairo in Egypt, respectively revealed similar findings. In contrary to the current findings, Sarkar et al. (2005) and Maqsood et al. (2014) found that penetration of vagina was the most common form of child sexual assault.

El-Elemi et al. (2011), in accordance to this study, showed that the most common type of penetration in the above 18 years age group, was vaginal penetration, they reported figures close to the figures of present study (35%).

Concerning the forensic examination in the present work, all the studied cases were examined by naked eye examination and with colposcope. This study demonstrated that colposcope was able to depict significantly higher number of positive cases than naked eye examination. Colposcopy was able to detect 58.67% of the cases as being positive. In comparison to colposcopy, naked eye examination was shown to drop 66 out of the 88 positive cases (85.33%). This finding emphasizes the high diagnostic value and the necessity of using colposcope in the forensic examination.

These results are aligning with Yung (2015) and Alaa El-Din et al. (2019) who demonstrated that colposcope improves finding genital injury in cases of sexual assault compared to naked eye examination alone. Similarly, a study performed by Rogers et al. (2019) deduced that in the detection of microtrauma following rape or sexual assault, colposcopy was superior to gross visual inspection. Robatjazi et al. (2016) also concluded that colposcope enhanced the accuracy of the genital examination, and the authors recommended using this modality for training examiners and for some special cases such as medical commissions, counseling, and especially pediatric cases of sexual abuse.

The findings of this work coincided also with Ernst et al. (2011) who revealed that colposcopy was better in sexual assault victims for the detection of further genital injury compared to gross examination. Genital findings were detected in 10% to 30% of female sexual assault victims using protocols involving traditional procedures without colposcopy; however, when colposcopy was employed, this rate increased to range between 87% and 92%.

However the results of present study are contradictory to Zink et al. (2010) study. They compared anogenital damage findings following consenting sexual intercourse using a comparable methodology. They came to the conclusion that anogenital damage findings from direct visualization and colposcopy were comparable. The forensic examiner's training could be one reason for these contradictory results. Another explanation could be the type of their sample which was consensual sexual intercourse cases; those most likely have less evident marks. The risk of genital harm from rape substantially outweighs the risk from consensual sexual activity.

The examination of genital injuries and the recording of physical indications using high-quality images can be done with a colposcope, a contemporary technique that improves practice sexual assault evaluation and provides victims of sexual abuse with the best care possible (Larkin et al., 2012). When injuries are not visible through an unassisted eye inspection and when it is necessary to preserve the images as proof in case jurisdiction is needed later on, the colposcopic examination is essential (Leeson et al., 2014).

The cases reported to be negative after examinations by naked eye and colposcope in this study were 62 (41.33% of all cases) who further examined after addition of toluidine blue. No extra data was obtained, and all the cases showed negative findings. They were 14 male cases (25.93%) and 48 female cases (50 %).

Literature on the utilization of toluidine blue in the assessment of rape cases is scant. Kotzé & Brits (2019) reported that the use of toluidine blue may improve the visibility of injury of additional sites independent of the examiner’s skill, and that the application of toluidine blue in comparison with the naked eye increased the number of visible injuries. In paediatric sexually abused patients, the visibility of posterior fourchette injuries with the naked eye increased with the use of toluidine blue. There is no discrepancy between the reported in the literature and this study findings, as all the studies investigated the additional value of toluidine blue in comparison to the naked eye examination alone, in contrast to this study which analyzed its potential additional value over the colposcope examination.

In this study, vaginal and rectal swabs were performed for assaulted cases. Those were 41 cases out of the total 150 (27.33%). The microscopic examination revealed that 17 cases (41.46%) were positive for seminal stain while 24 cases (58.53%) were negative. On comparison between the results of swab investigations and those of the colposcope examinations for the same cases, for the 17 confirmed cases, 8 were negative by colposcope (44.44%). For the 24 seminal stain negative cases, 14 cases were positive on colposcopic examination (60.87%). This could be interpreted that colposcope sensitivity was (52.9%), and the specificity was (41.7%).

Similar findings were reported by the study of Alaa El-Din et al. (2019). Sena et al. (2015) and Thackeray et al. (2011) who discussed the significance of tangible proof in establishing the commission of sexual assault and in identifying the attackers in such circumstances. A forensic lab can identify and characterize biological evidence which includes semen, blood, saliva, vaginal fluids, and vaginal epithelial cells. To increase the likelihood of a successful criminal prosecution in the future, physical evidence must be gathered quickly by trained workers and stored appropriately.

In the present study, clothes stains were carried out for cases who preserved their worn clothes during the assault without washing, these were 63 samples, and they were referred to the lab for seminal examination. 34 samples (53.96%) were positive for detection of seminal stain of the assailant while 29 cases (46.03%) were negative for microscopic examination. On comparison between the results of clothes stains and those of the colposcope examinations for the same cases, for the 34 confirmed cases, 11 were negative by colposcope (45.83%). While for the 29 clothes stain negative cases, 16 cases were positive on colposcopic examination (41.03%). This could be interpreted that colposcope sensitivity was (67.6%), and the specificity was (44.8%).

The results of present study are consistent with the research of Alaa El-Din et al. (2019), who reported that colposcopy skipped some positive data. Sommers (2007) and González (2017) had how the timing of the colposcopic examination, the healing of the microtrauma or friction mark, and the disappearance of the redness in the genitalia during external friction without penetration could be responsible for the positive results of clothes examinations and exchanges in sexual assault victims, even though the colposcopic examination produced negative results. Most of the time, anal penetration did not result in an obvious anal injury. An external anal examination might not be sufficient to detect an anal injury, and an oscope might be required. Newton (2013) counseled following up the guidelines of the American Academy of Pediatrics for the collection of forensic evidence and encouraged to collect the evidence within three days following the sexual abuse violation.

Sexual violation is usually under-reported for a number of causes, including disbelief and feeling of shame. In addition, there are a lot of victims have both violence and sexual abuse. Many nations lack an effective reporting system to ascertain the frequency of various forms of violence against women and children, and their definitions of violence vary greatly from one another. Governments, families, and communities are able to shirk their responsibilities when the actual scope of violence is not explored and revealed (Norris, 2015).

The absence of suitable data and statistics on the frequency of sexual assault and violence lead to difficulty in establishing good programs to deal with these problems, lack of or improper documentation and research on violence, sexual crimes, and violence against women and children in private and in public, makes the preparation for good intervention plans very difficult. Experience in many countries shows that women and men can be prepared to overcome all the forms of violence and public measures can be taken to prevent both the causes and results of violence especially sexual assaults (Temmerman, 2015).

Conclusion

Adopting policies that prioritize victims is crucial to lowering the incidence of sexual assault. The characteristics of sexual assault cases vary significantly between adults and kids as well as between the sexes.

In case of suspected sexual assault, the colposcope appears to be a suitable invasive instrument for examining both adults and children. Colposcope can provide the best documentation and correct diagnosis to support the history of the attackers and victims, enhancing the objectivity of forensic evidence gathering, but it won't replace the careful, sensitive, and well-trained professional examiners.

Recommendations

According to the current study, the colposcopic examination should be introduced to all forensic departments in Egypt to be used during sexual assault examination.

There is a great need for more comprehensive and reliable information about the prevalence of sexual assault in Egypt. The government should play a leading role in improving epidemiological information about this issue.

References

Abd El Rahman, A. E., Azab, S. M., & Ramadan, M. (2017). Study of cases of child sexual abuse referred for medico-legal examination in Cairo and Giza, Egypt, 2007–2011. Journal of child sexual abuse, 26(3), 308-318. DOI: 10.1080/10538712.2017.1282574

Abo-Seria, M., AbdelRahman, A., Mostafa, H., & Farag, H. (2019). Study of child sexually abused cases in Cairo governorates in the period from (2012) to (2016). Ain shams journal of forensic medicine and clinical toxicology, 32(1), 31-39. DOI: 10.21608/AJFM.2019.23674

Aboul-Hagag, K. E. S., & Hamed, A. F. (2012). Prevalence and pattern of child sexual abuse reported by cross sectional study among the University students, Sohag University, Egypt. Egyptian Journal of Forensic Sciences, 2(3), 89-96. DOI: 10.4103/0253-3223.106790

Alaa El-Din, E.A., Kamel, M.H., Sobhy, A., Rasheed, S.E. and Abdelkhalek, M.S. (2019). Sexual Assault Forensic Examination in adult and child cases: Is Colposcopy Really Necessary? Instant Journal of Forensic Science, 1:45-58.

Alderden, M., Cross, T. P., Vlajnic, M., and Siller, L. (2018): Prosecutors perspectives on Biological Evidence and Injury Evidence in Sexual Assault Cases. Journal of interpersonal violence, 0886260518778259. DOI: 10.1177/0886260518778259

AlMadani, O., Bamousa, M., Alsaif, D., Kharoshah, M. A., & Alsowayigh, K. (2012). Child physical and sexual abuse in Dammam, Saudi Arabia: A descriptive case-series analysis study. Egyptian journal of forensic sciences, 2(1), 33-37. DOI: 10.4103/0253-3223.96091

Connery, S. A. (2013). Three decade old cold case murder solved with evidence from a sexual assault kit. Journal of forensic and legal medicine, 20(4), 355-356. DOI: 10.1016/j.jflm.2012.09.017

El-Elemi, A. H., Moustafa, S. M., & Hagras, A. M. (2011). Reported cases of female sexual assault over 5 years period in Suez Canal area, Egypt: demographic study. Egyptian Journal of Forensic Sciences, 1(3-4), 118-123. https://doi.org/10.1016/j.ejfs.2011.08.002

El-Gendy, I.S. and Hassan, N.A. (2013): Medico-legal study of child sexual abuse in greater Cairo Egypt, during a 7-year period: 2005-2011. Am J Forensic Med Pathol, 34: 335-341. DOI: 10.1007/s11515-012-9422-6

Ernst, E. J., Speck, P. M. Aand Fitzpatrick, J. J. (2011): Usefulness: Forensic photo documentation after sexual assault, Advanced Emergency Nursing Journal. 33(1):29-38. DOI: 10.1097/TME.0b013e3182083128

Gonzalez, C. (2017). Recovering process from child sexual abuse during adulthood from an integrative approach to solution-focused therapy: A case study. Journal of child sexual abuse, 26(7), 785-805. DOI: 10.1080/10538712.2017.1330565

Greathouse, S. M., Saunders, J. M., Matthews, M., Keller, K. M., & Miller, L. L. (2015). A review of the literature on sexual assault perpetrator characteristics and behaviors. RAND Corporation. Retrieved from https://www.rand.org/ content/dam/rand/pubs/research_reports/RR1000/RR1082/ RAND_RR1082.pdf

Henry, N., & Flynn, A. (2019). Image-based sexual abuse: Online distribution channels and illicit communities of support. Violence against women, 25(16), 1932-1955. DOI: 10.1177/1077847718789909

Herrmann, B., Banaschak, S., Csorba, R., Navratil, F., & Dettmeyer, R. (2014). Physical examination in child sexual abuse: Approaches and current evidence. Deutsches Ärzteblatt International, 111(41), 692. doi: 10.3238/arztebl.2014.0692

Hirachan, N. (2019). Use of toluidine blue dye in detection of anogenital injuries in consensual sexual intercourse. Journal of Forensic and Legal Medicine, 64, 14-19. DOI: 10.1016/j.jflm.2019.03.002

Jänisch, S., Meyer, H., Germerott, T., Albrecht, U. V., Schulz, Y., & Debertin, A. S. (2010). Analysis of clinical forensic examination reports on sexual assault. International journal of legal medicine, 124, 227-235. https://doi.org/10.1007/s00414-010-0430-z

KAPS VICO Video Colposcope. DP Medical Section, 2019, Available.at:www.dpmedicalsys.com /medical/portfolio/kaps-vico-video colposcope[Accessed 16 Feb. 2019].

Kotze, J. & Brits, H. (2019). Child sexual abuse: The significance of the history and testifying on non-confirmatory findings. African journal for primary health care family medicine. pp(1-7). https://hdl.handle.net/10520/EJC-17247148cc

Larkin, H. J., Cosby, C. D., Kelly, D., & Paolinetti, L. A. (2012). A pilot study to test the differential validity of a genital injury severity scale, in development for use in forensic sexual assault examinations. Journal of forensic nursing, 8(1), 30-38. https://doi.org/10.1111/j.1939-3938.2011.01124.x

Leeson, S. C., Alibegashvili, T., Arbyn, M., Bergeron, C., Carriero, C., Mergui, J. L., and Petry, K. U. (2014): The future role for colposcopy in Europe. Journal of Lower Genital Tract Diseases, 18(1):70-80. DOI: 10.1097/LGT.0b013e318286b899

Lincoln, C. A. (2018): Sexual assault: forensic examination in the living and deceased. Academic forensic pathology, 8(4), 912-923. https://doi.org/10.1177/1925362118821490

Macionis, J.J., Plummer, K. (2012). Sociology: A Global Introduction. Harlow, England: Pearson/Prentice Hall; 2012. Available from: http://www.trove.nla.gov.au/work/ 24845695.

Magalhães, T., Dinis-Oliveira, R. J., Silva, B., Corte-Real, F., & Nuno Vieira, D. (2015). Biological evidence management for DNA analysis in cases of sexual assault. The Scientific World Journal, Volume 2015 | Article ID 365674 | https://doi.org/10.1155/2015/365674

Maqsood, M., Arif, M. and Butt, K.M. (2014): Incidence of Alleged Sexual Assault Cases in Lahore: It's Medico-legal and Social Aspects. Professional Med J, 8 (1):50-55.

Mathews, B., & Collin-Vézina, D. (2019). Child sexual abuse: Toward a conceptual model and definition. Trauma, Violence, & Abuse, 20(2), 131-148. https://doi.org/10.1177/1524838017738726

McKillop, N., Brown, S., Wortley, R., & Smallbone, S. (2015). How victim age affects the context and timing of child sexual abuse: Applying the routine activities approach to the first sexual abuse incident. Crime science, 4(1), 17. https://doi.org/10.1186/s40163-015-0031-8

Metwaly, M., Ismail, A.M., Sherif, M.M., Mahmoud, F.S., Mohammed, N.I. and Assasa, F.M. (2013). Study about sexual offences in Quena governorates. J Forensic Res, 19, 2. DOI: 193.227.29.94

Moreno, A. S. (2013). Age differences among victims of sexual assault: A comparison between children, adolescents and adults. Journal of forensic and legal medicine, 20(5), 465-470. https://doi.org/10.1016/j.jflm.2013.02.008

Mwaheb, M. A. (2016). Child Sexual Abuse in Fayoum Governorate, Egypt (2010-2014). J Forensic Res 7: 332. DOI: 10.4172/2157-7145.1000332

Newton, M. (2013): The Forensic aspects of sexual violence. Best Practice and Research Clinical Obstetrics and Gynecology, 27:77-90. https://doi.org/10.1016/j.bpobgyn.2012.08.020

Norris, P. (2015): Sexual assault, in Emergency Medical Services: Clinical Practice and Systems Oversight: Second Edition. pp: 77-90.

Planty, M., Langton, L., Krebs, C., Berzofsky, M., & Smiley-McDonald, H. (2013). Female victims of sexual violence, 1994-2010 (pp. 3-4). Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.

Robatjazi, M., Simbar, M., Nahidi, F., Gharehdaghi, J., Emamhadi, M., Vedadhir, A.A. and Alavimajd, H., 2016. Virginity testing beyond a medical examination. Global journal of health science, 8(7), p.152. doi: 10.5539/gjhs.v8n7p152

Rock, L. (2013). Department of Defense Annual Report on Sexual Assault in the Military. Fiscal Year 2012. Volume 2.

Rogers, S.A. and Rogers, B.A., 2021. Expanding our view: Demographic, behavioral, and contextual factors in college sexual victimization. Journal of interpersonal violence, 36(23-24), pp.NP13094-NP13120. https://doi.org/10.1177/0886260520905076

Ross, S. (2021). Australian Bureau of Statistics. The Encyclopedia of Research Methods in Criminology and Criminal Justice, 2, 767-773. https://doi.org/10.1002/9781119111931.ch144

Saint-Martin, P., Bouyssy, M., & O'Byrne, P. (2007). Analysis of 756 cases of sexual assault in Tours (France): medico-legal findings and judicial outcomes. Medicine, Science and the Law, 47(4), 315-324. https://doi.org/10.1258/rsmmsl.47.4.315

Sarkar, S.C., Lalwani, S., Rautji, R., Bhardwaj, D.N. and Dogra, T.D. (2005): A Study on Victims of Sexual Offences in South Delhi, Journal Famwelf, 51(1):60-6

Sealey, B. C. (2015). Protecting Children from Child Abuse & Neglect in Egypt: Addressing Neighborhood Factors. Egyptian Journal of Social Work, 1(1), 59-77. DOI: 10.21608/EJSW.2015.8836

Sena, A.C., Hsu, K.K., Kellogg, N., Girardet, R., Christian, C.W., Linden, J., Griffith, W., Marchant, A., Jenny, A. and Hammerschlag, M.R., (2015): Sexual assault and sexually transmitted infections in adults, adolescent and children. Clinical infectious diseases, 61(8), pp.S856-S864. https://doi.org/10.1093/cid/civ786

Sommers, M. (2007). Defining patterns of genital injury from sexual assault: a review. Trauma, Violence, & Abuse, 8(3), 270-280. https://doi.org/10.1177/1524838007303194

Subramanian, S., & Green, J. S. (2015). The general approach and management of the patient who discloses a sexual assault. Missouri medicine, 112(3), 211. PMCID: PMC6170132

Subramaniyan, V. K. S., Reddy, P., Chandra, G., Rao, C., & Rao, T. S. (2017). Silence of male child sexual abuse in India: Qualitative analysis of barriers for seeking psychiatric help in a multidisciplinary unit in a general hospital. Indian journal of psychiatry, 59(2), 202. doi: 10.4103/psychiatry.IndianJPsychiatry_195_17

Temmerman, M. (2015): Research priorities to address violence against women and girls. The Lancet, 385(9978), e38-e40. https://doi.org/10.1016/S0140-6736(14)61840-7

Thackeray, J. D., Hornor, G., Benzinger, E. A. and Scribano, P. V. (2011): Forensic evidence collection and DNA identification in acute child sexual assault. Pediatrics, peds-2010:223-226. https://doi.org/10.1542/peds.2010-3498

The Central Agency for Public Mobilization and Statistics (CAPMAS, 2017). On the Occasion of the international day for elimination of violence against women, Press Release, 23-11-2016 pp(1-2).

World Health Organization (WHO) (2013): Responding to intimate partner violence and sexual violence against women: WHO clinical and policy guidelines. World Health Organization, pp. 56-66.

Yung, C. R. (2015): Concealing campus sexual assault: An empirical examination. Psychology, public policy, and law, 21(1), 1. https://doi.org/10.1037/law0000037

Zink, T., Fargo, J. D., Baker, R. B., Buschur, C., Fisher, B. S., & Sommers, M. S. (2010). Comparison of methods for identifying ano-genital injury after consensual intercourse. The Journal of emergency medicine, 39(1), 113-118. https://doi.org/10.1016/j.jemermed.2008.08.024

نمط الإصابات في حالات الاعتداء الجنسي و دور المنظار المهبلي في اكتشاف الإصابات الخفية

بانسيه عبد الفتاح مقلد [1] و ياسر فؤاد العقيد [2] و داليا محمد نبيل زكى [2]

الملخص العربي

المقدمه: ينطوي العنف ضد النساء والأطفال على أي عمل عنيف قائم على أساس الجنس و يؤدي إلى إصابة أو معاناة جنسية أو بدنية أو نفسية للضحايا. **الهدف من الدراسه** :دراسة نمط الاعتداءات الجنسية على الإناث في جميع الأعمار والأطفال الذكور فقط لتقييم دور المنظار المهبلي في فحصهم. **المرضى وطريقة الدراسة:** تم تقسيم 150 حالة إلى مجموعتين وفقًا للعمر "المجموعة (أ) الصغار الذين تقل أعمارهم عن 18 عامًا، والمجموعة (ب) فوق 18 عامًا".**النتائج** :تراوحت أعمار الحالات بين 1-40 سنة، 96 من الإناث و 54 من الذكور. تم اكتشاف زنا المحارم في 44 حالة وإصابات جسدية في 41 حالة وتهديد في 72 حالة. وفيما يتعلق بنوع الاعتداء الجنسي، كان الإيلاج الشرجي للقضيب شائعًا في الفئة العمرية (أ) بينما كان الإيلاج المهبلي للقضيب شائعًا في الفئة العمرية (ب). تم الكشف عن إصابات الأعضاء التناسلية في 22 حالة عن طريق الفحص بالعين المجردة وفي 88 عن طريق الفحص بالمنظارالمهبلي. ولم تتمكن إضافة صبغة التولويدين الزرقاء من اكتشاف أي إصابات إضافية. تم إجراء المسحات المهبلية والمستقيمة فقط في 41 حالة، 17 منها كانت إيجابية للسائل المنوي. وبالنسبة لهذه الحالات المؤكدة، أظهرت 9 منها نتائج إيجابية أثناء الفحص بالمنظار المهبلي.و في 63 حالة، الذين حافظوا على ملابسهم دون غسل، كانت34 منهم إيجابية للكشف عن السائل المنوي. **الاستنتاج** :هناك اختلافات محتملة في الفروق بين حالات الاعتداء الجنسي بين الجنسين وبين البالغين والصغار. يبدو أن المنظار المهبلي هو نهج جراحي مقبول لفحص طب الأطفال والبالغين في حالة الاشتباه في الاعتداء الجنسي.

1. مصلحة الطب الشرعي، وزارة العدل، القاهرة، مصر
2. قسم الطب الشرعي و السموم الإكلينيكية، كلية الطب، جامعة عين شمس، القاهرة، مصر