

Analysis of clinical forensic examination reports on sexual assault

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Abstract Medical-forensic examination of sexual assault victims and alleged offenders is a common task of many forensic institutes. In the current study, the results from samples taken at the Institute of Legal Medicine, Hanover Medical School, during a period from 2005 to 2007 were retrospectively evaluated. In total, 292 victims (283 females and nine males) and 88 suspects were examined. At the time of the assault, 41.8% of the victims and 43.2% of the alleged perpetrators were under the influence of alcohol. Injuries were found in 84.9% of the victims and 39.8% of the suspects. Thirty victims (10.3%) reported having been choked or strangled. Cytology was performed in 218 victims. In 81 cases (38.0%), sperm could be detected in vaginal swabs up to 3 days post-assault. In seven (18.9%) out of 37 anal samples, evidence of sperm could be found 24 h post-assault. None of 22 oral samples was positive for sperm. Out of 301 sexual assault cases, 171 could be proved by means of medical-forensic examination. In summary, our evaluation shows that an early medical-forensic examination of both victim and suspect can secure numerous medical findings. Furthermore, persons intoxicated by alcohol, handicapped persons and persons with

psychiatric disorders are more vulnerable to become a sexual assault victim.

Keywords Sexual assault · Alcohol · Disability · Physical examination · Clinical forensic medicine

Introduction

Physical examination of sexual assault victims and of alleged assailants is a common task at many forensic institutes. At the Institute of Legal Medicine, Hanover Medical School, sexual offence expertise is the second largest group of medical-forensic examinations after physical injury. According to German law, sexual offence is defined as an act that restricts the freedom of decision about sexual activity and constrains the undisturbed sexual development of young people as well as severe sexual harassment [1].

According to the current literature [2–4], one in five women will experience sexual violence and one in ten women will be the victim of rape at least once in a lifetime. In the USA, 20% of women and 5–10% of men experience sexual violence [5]. In contrast to other criminal offences, the estimated number of actual cases of rape is very high and lies between 1:3 and 1:50, which suggests a severe psychological trauma of rape victims [6, 7]. However, examining sexual assault victims, it should be considered that some reported rape incidents are based on false allegations. A large portion of false reports comes from young girls as an excuse for a long absence from home or from females with a personality disorder [6, 8, 9].

The aim of the present study was to evaluate sexual assault victims, alleged perpetrators, victim–suspect relationships,

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time until examination and physical findings in sexual assault cases as well as to determine sexual offence characteristics.

Material and methods

The current investigation is a retrospective analysis of medical-forensic examinations in sexual assault cases. The examinations were performed at the Institute of Legal Medicine, Hanover Medical School, between 2005 and 2007. Cases of sexually assaulted children (under 14 years) were evaluated in a separate study.

The medical-forensic examination included a complete body examination followed by gynaecologic examination on the gynaecologic chair and/or anal examination. Cases involving adolescents were interpreted according to the modified Adams' classification system [10, 11].

In accordance with assault history, swabs were taken from the victims. Smears were made on microscopic slides, stained using the STIASNY method and examined under the microscope for the detection of sperm. From the suspects, penile swabs were taken. These were stained using the STIASNY method or by Lugol's solution if required and examined under the microscope or preserved for a potential DNA analysis. The results of the DNA analyses, which were performed by the State Office of Criminal Investigation of Lower Saxony, are unknown to us.

One victim refused the medical-forensic examination; another four victims declined the genital examination. In three cases, the genital examination with sample collection had been completed prior to the medical-forensic examination. In 15 cases, no anal-genital examination was performed due to the history of assault.

Results

Statistical data

The study is based on 301 sexual assault cases. In total, 292 victims (283 females (96.9%) and nine males (3.1%)) and 88 alleged assailants (all males) were examined at the Institute of Legal Medicine, Hanover Medical School, during the years 2005 to 2007. Almost all (98.9%) of the medical-forensic examinations were performed upon police request. Only three examinations were performed as medical consultations.

Mean age of the victims was 26.7 years (range, 14–78 years), with 67 victims were under age at the time of assault. Mean age of the alleged perpetrators was 33.9 years (range, 16–71 years). Of these, five were under age at the time of assault.

Disability/psychiatric disease

Seventeen victims (5.8%) had a psychiatric disorder. Of those, five had a borderline personality disorder, four had a depression and one victim suffered from schizophrenia. Nine victims were mentally handicapped, another three were both mentally and physically handicapped. One victim suffered from dementia.

History of assault

In 241 cases (85.2%), a penile-vaginal assault was suspected (202 victims (71.4%) reported a penile-vaginal penetration; attempted penetration was indicated by 11 victims (3.9%); in 28 cases (9.9%) it was unclear whether a penetration had taken place). Additionally, 194 victims (68.6%) reported an unspecified potentially unprotected ejaculation. In two cases, an object-vaginal penetration had taken place. A penile-anal assault was suspected in 33 cases (11.3%; 26 victims (8.9%) were subjected to penile-anal penetration; one victim reported attempted anal penetration; penetration was alleged by six victims (2.1%)). A partly questionable unprotected ejaculation was reported by 22 victims (7.5%). One victim was exposed to object-anal penetration. A penile-oral assault (fellatio) was documented in 39 cases (13.4%; penetration was reported in 35 cases (12.0%); an attempted penile-oral penetration was documented in four cases (1.4%)). A partly questionable ejaculation was reported in 15 cases (5.1%). In 49 cases (17.3%), a digital-vaginal assault was involved (a manipulation was stated by 32 victims (11.3%); a manipulation was alleged by nine victims (3.2%); in eight cases (2.8%), a digital-vaginal contact without penetration was documented). Three victims (1.0%) reported a digital-anal assault (a penetration was stated by two victims and was alleged by one victim.). Six victims (2.1%) reported kisses by the perpetrator (Table 1).

Overall, completed vaginal penetration (penile/digital/instrumental) was reported by 222 victims (78.4%; whereby both penile and digital penetration was reported in 14 cases).

Table 1 Assault types, multiple mentioning

Assault types	Cases
Penile-vaginal	241
Digital-vaginal	49
Object-vaginal	2
Penile-anal	33
Digital-anal	3
Object-anal	1
Fellatio	39
Kiss	6

In 155 cases (51.5%), the assault occurred in an apartment or a private residence. The majority of cases took place during the summer months (32.2%) and at night (51.2%).

In 39 cases (13.0%), victims reported repeated sexual abuse.

Suspect identification

In 73 cases (24.3%), the suspect was the victim's partner/former partner/family member and in additional 73 cases (24.3%) it was an acquaintance. The alleged assailant was a stranger in 38 cases (12.6%) (Fig. 1).

Time until examination

210 victims (71.9%) and 74 alleged perpetrators (84.1%) were examined within 24 h of the event. A total of 351 medical-forensic examinations (92.4%) took place within 72 h post-assault (Fig. 2).

Alcohol and/or drugs

At the time of the assault, 122 victims (41.8%) and 38 alleged assailants (43.2%) were under the influence of alcohol, whereby in the prevailing majority of the cases, estimation of alcohol intoxication is based on the anamnestic data and on the objectifiable findings at the clinical forensic examinations. In 33 cases, the breath alcohol concentration test (BRAC) was performed by the police authorities; in 12 cases, the alcohol level was determined by blood alcohol concentration (BAC), and once—via urine alcohol concentration (UAC) with a value of 0.46‰ (Table 2). The measured BRAC values in victims were between 0.11‰ and 3.65‰ with a mean level of 1.51‰. The BAC values in victims ranged from 0.15‰ to 4.94‰ with a mean level of 1.73‰ (Fig. 3).

Twelve victims (4.1%) and six suspects (6.8%) reported drug intake. In five victims, urine or blood tests revealed drug consumption, these being cannabinoids in three cases (once, 6 ng/ml (traces) tetrahydrocannabinol carboxylic acid in the urine with sample collection 24 h post-assault; once, 208 ng/ml tetrahydrocannabinol carboxylic acid in the urine with sample collection within 12 h; once, the urine test was positive for cannabinoids at the pre-examination, the time interval between the event and the sample collection was unclear), benzodiazepines in one case (a questionable positive finding for benzodiazepines in the urine at the pre-examination with sample collection 24 h post-assault), and benzodiazepines and cocaine in one case (in serum: cocaine 22.3 ng/ml, benzoylecgonine 1,273 ng/ml, ecgoninemethylester 275 ng/ml, Diazepam 45.8 ng/ml, Nordiazepam 270 ng/ml, Oxazepam <10 ng/ml with sample collection within 6 h).

Thirty victims (10.3%) reported a total amnesia for the assault. Out of these, 28 were under the influence of alcohol at the time of the assault, whereby alcohol intoxication was anamnesticly estimated in 13 cases; in four cases, alcoholisation was objectified at the physical examination; in four cases, an alcoholised state was documented in accordance with BRAC results (0.23–2.1‰), and in six cases, alcohol intoxication was determined by BAC (0.45–1.7‰). In one case, the urine alcohol concentration was 0.46‰.

In 15 cases, the administration of knockout drops was suspected. Only in two cases could benzodiazepines (see above) be detected, whereby one victim reported no blackout. However, the police authorities suspected that in this case the victim had not been completely oriented to the assault. Furthermore, cocaine and its by-products were found in serum, and the blood alcohol concentration was 0.15‰. The victim reported having been forced to multiple consumption of cocaine and alcohol by the assailant, and the drinks would have had a strange taste.

Fig. 1 Relationship to the suspect

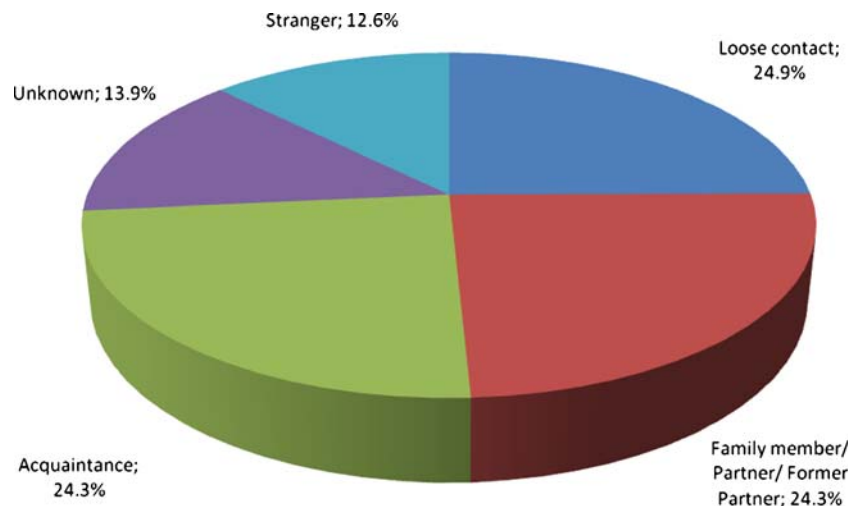
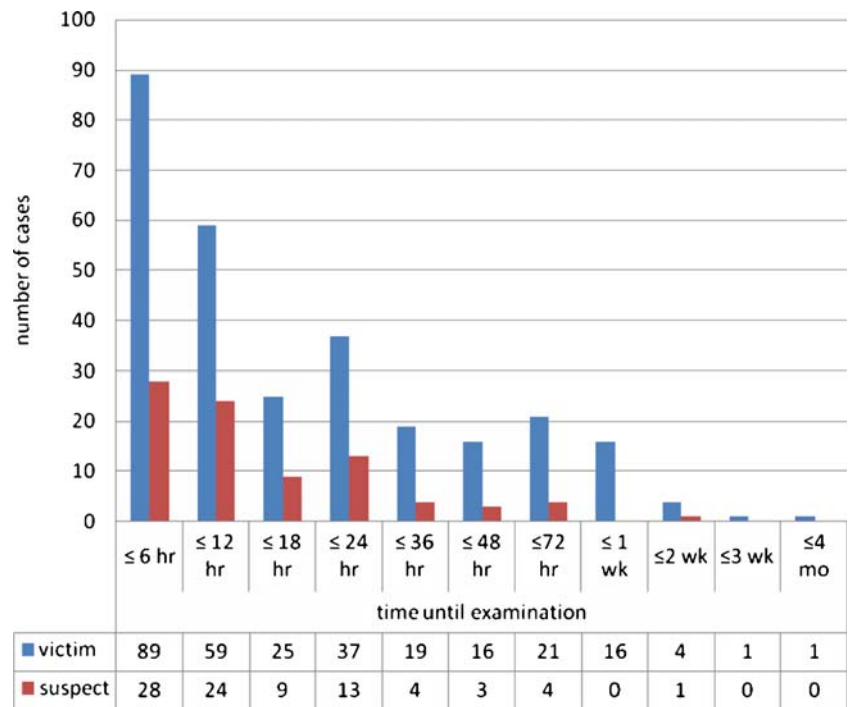


Fig. 2 Time until examination



Physical examination findings

A total of 291 victims underwent medical-forensic examination. Extra-genital injuries were observed in 205 victims (70.4%), whereby 74.0% of the victims, whose medical findings could be collected, were examined within 24 h. In victims, the most frequent type of injuries were bruises, superficial abrasions and erythemas located on thigh (17.2%), upper arm (13.9%) and face (12.7%). Thirty victims (10.3%) were subjected to choking or strangulation. The use of blunt force was seen in 114 cases (39.2%). Three victims had fractures (two nasal bone fractures, one upper arm fracture). In four victims, cigarette burns were seen. Another four victims sustained sharp force injuries (knife, piece of broken glass). In 22 cases (7.6%), the victim experienced a potentially life-threatening situation due to the assault; there was no acute life-threatening situation. Thirty-one victims were hospitalized and nine victims received outpatient treatment.

Table 2 Alcohol consumption (victims and suspects)

Alcohol estimation	Cases
Self-reported use of alcohol	62
Objectifiable findings at examination	52
BRAC	33
BAC (hospital)	5
BAC (Institute of Legal Medicine)	7
UAC (Institute of Legal Medicine)	1

Thirty-five alleged offenders (39.8%) had extra-genital injuries, whereby 77.1% of the alleged perpetrators, whose medical findings could be collected, were examined within 24 h. The most common injuries were located on hands (12.6%), forearms (12.0%), face (10.9%), and neck (10.4%).

Out of 292 victims, 269 underwent genital and/or anal examination. In 166 cases (61.7%), an anal-genital injury was observed (154 victims had genital injuries alone, four victims had both genital and anal injuries, and eight victims had anal injuries alone) (Tables 3 and 4), whereby 77.7% of the victims, whose medical findings could be collected, were examined within 24 h. With exception of erythemas as unspecific findings, diagnostically proven anal-genital

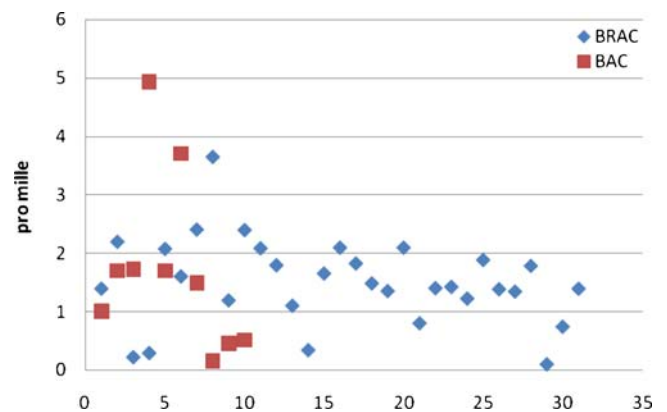


Fig. 3 Breath alcohol concentration (BRAC) and blood alcohol concentration(BAC) in victims

Table 3 Victims—genital findings, multiple mentioning

Genital Findings	Cases
Normal	111
Erythemas	151
Superficial laceration/abrasion	51
Swelling labium	3
Bruise labium/clitoris	3
Foreign hairs	12
Hymenal erythema	1
Defloration/transection	7

injuries were found in 72 victims (26.8%). In seven adolescents (between 14 and 19 years old), a defloration injury was seen, whereas the injury observed in one girl seemed to be older. In that case, a repeated sexual assault had taken place. One girl with an acute transection of the hymen had had consensual intercourse the day before the assault. In another 15-year-old girl, a hymenal erythema was present.

Of 88 alleged perpetrators, 81 underwent a genital examination (Table 5). In three suspects (3.7%), genital injuries were found, whereby each of the seven alleged perpetrators, whose forensic findings could be collected, were examined within 24 h, and 85.7% underwent the examination even within 12 h post-assault. In two cases of genital injuries abrasions in form of scratch marks were observed. In the third case, a fissure of the frenulum praeputii was present.

In total, extra-genital and genital injuries were found in 84.9% of the victims and in 39.8% of the alleged perpetrators.

Forensic collection and evidence finding

During the medical-forensic examination, vaginal swabs were taken from 213 victims (79.2%), anal swabs were taken from 37 victims (13.8%), oral swabs were taken in 22 cases (8.2%), swabs from skin surface and from clothes were taken in seven and two cases, respectively, and were afterwards examined for evidence of sperm. In total, cytology was performed in 218 victims (74.7%). Of 213 victims, vaginal sperm could be detected in 81 cases

Table 4 Victims—anal findings

Anal Findings	Cases
Superficial laceration/abrasion	5
Bruises	1
Fissures	3
Erythemas	3

Table 5 Suspects—genital findings

Genital Findings	Cases
Normal	74
Abrasions	2
Erythemas	2
Fissure frenulum praeputii	1
Foreign hairs	2

(38.0%), whereby the sperm detection was successful in 53 victims (46.5%) out of 114 who were examined within 12 h post-assault and in 22 victims (43.1%) out of 51 who were examined within 12 to 24 h after the assault. No sperm could be detected 3 days post-assault; however, the time until examination was unclear in one case (Fig. 4). In two cases, DNA match of sperm to the alleged perpetrator was undertaken and was successful in both cases. Out of 37 anal swabs taken within 24 h, seven (18.9%) were positive for sperm. None of 22 oral swabs was positive for sperm. Evidence of sperm was found in six (85.7%) of the seven skin swabs as well as in one of the two swabs taken from the clothing.

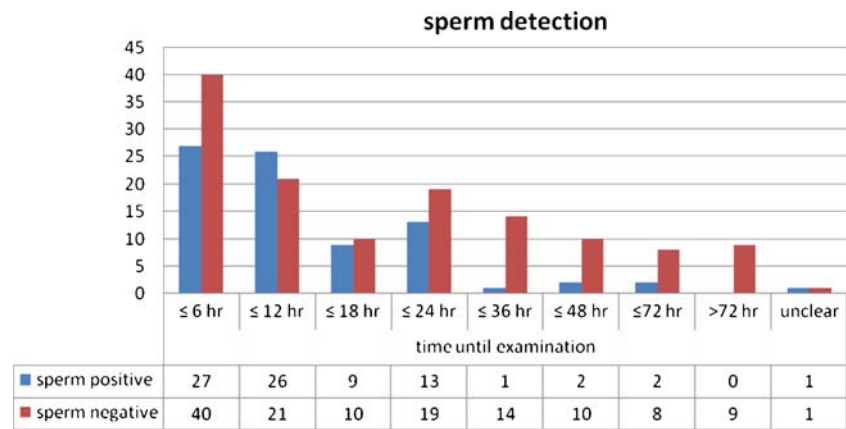
Swabs were taken and analysed from 24 (27.3%) of the alleged perpetrators. In 13 cases (54.2%) when the examination was performed within 24 h, the sperm detection was successful. One day after the assault, evidence of sperm could be found in none of the cases. In two of the alleged perpetrators, the victim's vaginal epithelial cells were examined and could be detected by means of DNA analysis. The medical-forensic examination was performed 8.5 h post-assault in one case and 15 h after the alleged event in another case.

In total, 171 (56.8%) of the 301 sexual assault cases could be proved by means of medical-forensic examination.

Discussion

Medical-forensic examinations provide a basis for the documentation as well as reconstruction and interpretation of medical findings that will not be available later and will not exist in the original form at the time of the potential court hearing [12–14]. The task of the forensic medicine specialist is to verify whether the obtained samples are consistent with the victim's statement. In agreement with other reports [5, 15, 16], the majority of the sexual assault victims were female (96.9%). However, it should be kept in mind that male victims report a sexual assault less frequently.

In the current study, the percentage of extra-genital injuries of the victims was high (70.4%), whereas only 26.8% diagnostic findings were observed in the anal-genital

Fig. 4 Sperm detection, vaginal

region. Because of the predominantly found extra-genital injuries a complete physical examination is strongly advisable to confirm the victim's testimony. Similarly, in the published literature [2, 4, 17–19], extra-genital injuries are described in 44.5–77.0% as compared with genital injuries (11.3–26.2%). In contrast, Grossin et al. [15] and Marchbanks et al. [20] found extra-genital injuries only in 39.1% and 39.6% of the cases, respectively. However, it should be mentioned that the majority of the victims consisted of children and adolescents, e.g., in the study by Grossin et al. [15], the mean age was 15.9 years. The lower rate of extra-genital injuries reported in both studies can be explained by the fact that sexual assault on children frequently takes place without the use of physical force [11]. Riggs et al. [16] reported genital injuries in 53% of the cases, which is a higher rate compared to similar studies and to the current one, although no definition of genital injuries was provided. In our study, too, mucosal erythemas were found more frequently (151 cases) for example, whereby an erythema should be considered as a non-specific finding, since it commonly occurs as a result of an infection, insufficient hygiene or other irritations and therefore it was not to be evaluated as a diagnostic genital injury in this study. In total, 77.7% of the victims, whose anal-genital findings were collected, were examined within 24 h. Similarly, Sugar et al. [17] performed 77% of the examinations within 24 h. So an early medical-forensic examination is necessary to document extra-genital and genital injuries.

Considering the low rate of genital injuries, it should be taken into account that rape represents only a certain group of sexual assault cases. Other forms of sexual violence like fondling, kisses and oral abuse do not result in genital injuries. In the current study, 241 victims (85.2%) suspected a penile-vaginal contact. Furthermore, there were 49 cases (17.3%) of digital-vaginal contact, two cases of object-vaginal contact, 33 cases (11.3%) of penile-anal contact, three cases of digital-anal contact and one case of object-anal contact. Fellatio and kisses

were reported in 39 (13.4%) and six cases, respectively. Overall, vaginal penetration (penile/ digital/ instrumental) was reported by 222 victims (78.4%). In the published studies [4, 16, 19], the most frequent type of penetration was also vaginal (55–83%).

Seven defloration injuries were observed with an acute injury in six cases and an older defloration in one case, whereby all the victims were adolescents between 14 and 19 years old. A hymenal erythema was found in another 15-year-old girl. According to modified Adams' classification system, defloration injuries (complete deep notches or clefts to the basis of hymen) as well as ecchymoses or bruising of the hymenal rim are diagnostic of sexual abuse in children and adolescents [10, 11]. The rate of the classic defloration injury in adolescents and women is low. For this reason other genital injuries, which are not diagnostic for sexual abuse, as well as extra-genital injuries become more important. Also Kleemann et al. [18] found acute defloration injuries in only two cases out of 141 adult and adolescent sexual assault victims. Naeve and Lohmann [21] reported 17 cases of defloration injuries out of 213 examined female victims (8%), the majority of these lesions being observed in adolescents under the age of 16.

In agreement with the results of other studies [18, 21], the rate of the alleged perpetrators examined was lower than that of the victims. In contrast to 292 victims, only 88 alleged assailants underwent medical-forensic examination. Three suspects had genital injuries. In two cases, scratch marks were observed as the result of the victim's self-defence. One victim reported having tried to keep hold of the offender's genitalia. In the third case, a fissure of the frenulum praeputii was observed. This injury is most likely to emerge during a sexual intercourse as a result of preexisting anomalies or scarring so that it also could have been sustained during a sexual intercourse by mutual consent. In total, medical genital findings could be collected from seven alleged perpetrators (Table 5). Each of the seven alleged assailants was examined within 24 h and 85.7% were examined even within 12 h. In the majority

of the cases, no genital injuries were observed since the victim frequently did not defend herself/himself due to intimidation, shock or alcohol intoxication or because the self-defence injuries tended to be located on hands, forearms, face and neck of the alleged perpetrator. However, due to their healing ability, abrasions and scratch marks can only be diagnosed if the offender is examined early enough, which is not possible with an unknown or fleeing perpetrator.

In victims, extra-genital injuries in form of bruising, superficial abrasions and erythemas were mostly located on thighs, upper arms and face, whereby these injuries are to be regarded as defence injuries. A similar order of extra-genital findings was also described by other authors [2, 18, 21]. Betz and Eisenmenger [22] point out that foremost a plain redness is detectable at most up to two days after the event, which proves the urgency of a prompt medical-forensic examination. Thirty victims (10.3%) reported having been strangled or choked. In three victims, fractures were present (two nasal fractures, one fracture of the upper arm). Altogether, the rate of serious injuries is low. In the cases of choking or fractures the more aggressive behaviour could be caused by the influence of alcohol or by the effort of the suspect in preventing the victim to scream or to recognize him. The use of physical force against the neck in sexual assault cases is described in the literature [8, 17, 18] in a range from 10% to 20%. Marchbanks et al. [20] reported broken bones or teeth in 3.9% of the cases and stated an increasing odds ratio for extra-genital injury if the victim made use of self-protective measures. For 22 victims (7.6%), the rape incident was potentially life threatening. After the incident, 31 victims were hospitalized and nine victims received outpatient treatment. Riggs et al. [16] reported that 20% of the victims needed additional medical procedures, whereas in the study by Alempijevic et al. [2] none of the victims required hospital treatment. Often, little or no physical force is used in sexual offence cases so that victims rarely suffer any consequential physical damage. In contrast, psychological strain of the victims may persist for several years.

Extra-genital injuries in alleged perpetrators (39.8%) were predominantly located on hands, forearms, face and neck as defence injuries. Also Naeve and Lohmann [21] found that the most frequent type of injuries in alleged perpetrators were defence injuries inflicted by the victim in the form of bites on fingers and scratches on hands and face. In contrast, Kleemann et al. [18] observed the majority of extra-genital injuries in alleged perpetrators on upper arms, breast, neck, face and hands, whereby these injuries are to be regarded as defence injuries, too.

In the literature [15, 16, 18, 19, 21], the reported rate of successful sperm detection is 15–45%. In our study, cytology was performed on 213 victims. In 81 cases

(38.0%), vaginal sperm could be detected up to 3 days post-assault (Fig. 4). In anal samples, sperm could be detected in seven out of 37 cases up to 24 h post-assault. Thus, the sample investigation for vaginal and anal sperm seems to be advisable up to 72 h and up to 24 h, respectively. None of the 22 oral swabs was positive for sperm, which might be due to rapid cleaning processes or vomiting by the victims. In contrast, sperm could be detected in six out of seven skin surface swabs and in one out of two swabs taken from the clothing so that skin surface swabs and swabs taken from clothing could secure additional evidence. In the study by Kleemann et al. [18], sperm could be detected in 44% of the vaginal samples only up to 36 h post-assault, in one out of 11 anal samples only up to 2 h post-assault and in two out of four samples taken from the clothing, whereas none of the seven oral samples was positive for sperm.

In 24 alleged perpetrators, cytological examination of penile swabs was performed. Of these, 13 (54.2%) were positive for sperm up to 24 h post-assault as an indication of ejaculation having taken place. One day post-assault, none of the samples was positive for sperm. Conversely, Kleemann et al. [18] found evidence of sperm in only four (14.8%) out of 27 cytologically examined samples, whereby all the samples were taken by means of penile impression smear.

Furthermore, an examination of the victim's vaginal epithelial cells was undertaken in two alleged perpetrators and was successful in both cases. One of the alleged assailants was examined 8.5 h post-assault, the other one underwent the examination 15 h after the event. Kleemann et al. [18] could also detect vaginal epithelial cells in two alleged perpetrators. In the study by Kaarstad et al. [23], DNA profile of the female victim could be successfully produced from the alleged perpetrator's penile sample in 26 out of 97 cases. A DNA analysis of the penile smear for detection of available foreign material of the victim is particularly advisable with early presented suspects, since this is the only way for a positive match to the victim, while the microscopic detection of sperm supplies evidence of an ejaculation only, and the histologic finding of vaginal epithelial cells proves that a sexual intercourse had taken place without the identification of the partner. In Hanover/Lower Saxony, the DNA analysis is ordinarily performed at the State Office of Criminal Investigation and only rarely at the Institute of Legal Medicine.

Consistent with the current literature [4, 5, 17, 19, 24], the suspect was someone known by the victim in the majority of cases (48.6%) (Fig. 1). Repeated abuse was present in 13.0% of cases. Some authors [5, 24] describe repeated sexual abuse even in 39% of women. The high percentage of suspects, which are known by the victims, can explain the high rate of repeated abuse, because it is more likely to be a repeated victim, if the alleged

perpetrator lives in the same household or is frequently in the victim's home. Most cases of sexual assault occurred in a private residence (51.5%), in summer months (32.2%) and at night (51.2%). Riggs et al. [16] and Saint-Martin et al. [4] also documented that the majority of rape incidents occurred in the victim's or assailant's home, which can be explained by the fact that the offender is often someone known to the victim.

At the time of assault, 122 victims (41.8%) and 38 alleged assailants (43.2%) were under the influence of alcohol (Table 2). So a high percentage of both victims and suspects have drunken alcohol before the assault. Therefore it seems to be more likely to be a victim of sexual assault, if the victim or the alleged perpetrator is under the influence of alcohol. The breath alcohol concentration values (BRAC) of the victims were between 0.11‰ and 3.65‰ with a mean level of 1.5‰. The ten blood alcohol concentrations of the victims ranged from 0.15‰ to 4.94‰ with a mean level of 1.73‰ (Fig. 3). In five victims, urine or blood tests revealed drug consumption: cannabinoids in three cases, benzodiazepines in one case, as well as benzodiazepines and cocaine in one case. Similarly, Sugar et al. [17] reported the consumption of alcohol or drugs in 52% of victims and Ingemann-Hansen et al. [19] documented alcohol intake prior to the assault in 46% of the cases, whereby a positive pro mille with a mean level of 0.58 (range, 0.01–2.27) could be found in 66% of these cases. The higher pro mille mean level of 1.73 in our study can be explained by the fact that the police authorities requested a victim's blood test only in cases when the alcoholised state was obvious and should have been toxicologically evidenced and secured, and when the time interval between the event and the presentation amounted to less than several hours. Slaughter [25] as well as ElSohly and Salamone [26] also detected alcohol followed by cannabinoids in the majority of samples taken. Overall, the estimation of alcohol intoxication was based on the anamnesis and objectifiable findings of clinical forensic examinations in the prevailing majority of the cases of the present study. Due to the fact that a number of sexual offence cases are notified to the police only with time delay, it is often impossible to objectify self-reported alcohol intoxication of the victim at the time of the assault by means of clinical forensic examination. For example, seven victims who reported anamnesticly being under the influence of alcohol at the time of the assault, arrived for medical examination several days post-assault. In such cases, toxicological analyses of blood or urine are no longer possible.

A total amnesia for the assault was reported for 10.3% of the victims. Of those, 28 were under the influence of alcohol at the time of the incident, whereby alcohol intoxication was anamnesticly estimated in 13 cases; in

four cases, alcoholisation was objectified on physical examination; in four cases, alcoholised state was documented in accordance with BRAC results (0.23–2.1‰), in six cases, alcohol intoxication was recorded according to the BAC values (0.45–1.7‰), and in one case it was determined via the UAC. In this way, the blackout report can be explained in those cases by partly obvious alcohol intoxication (BRAC values up to 2.1‰; BAC values up to 1.7‰). Mußhoff and Madea [27] also described alcohol as the most common rape drug. In the current study, knockout drops (benzodiazepines) could be detected in two cases. Similarly, in the study by Saint-Martin et al. [4], 7% of victims reported impaired consciousness, whereby the authors suspected a drug facilitated sexual assault in 2.9% of the cases. Sugar et al. [17] documented a partial amnesia in 15% of victims and total amnesia in 10% of victims. One victim reported no blackout in our study. In this case, the victim reported having been forced to the multiple consumption of cocaine and alcohol by the offender, and the drinks would have had a strange taste. In the serum, cocaine and its by-products, blood alcohol with 0.15‰ as well as Diazepam, Nordiazepam and Oxazepam were found. The measured values of benzodiazepines would suggest a prior consumption, and the incomplete orientation reported by the police is due to the cocaine intake in the first place. In no case gamma hydroxybutyrate could be detected. A delayed presentation with blood and urine sampling several hours after the assault is most often the cause of the rare detection of knockout drops.

Seventeen victims (5.8%) were suffering from a psychiatric disorder. In the study by Sugar et al. [17], 26% of the victims had a psychiatric illness, whereas Saint-Martin et al. [4] reported 4% victims with psychiatric diagnosis. Thirteen victims (4.5%) were mentally and/or physically handicapped. Similarly, in the study by Saint-Martin et al. [4], 7% of the victims were mentally or physically handicapped. Other authors [5] report that up to 90% of disabled persons experience sexual violence. So persons with a psychiatric disorder or handicapped persons have a higher risk to become victim of sexual assault.

In total, 171 (56.8%) out of 301 sexual assault cases could be proved by means of the medical-forensic examination as a principal item in confirming the victim's statement. In the study by Naeve and Lohmann [21], medical-legal examination provided confirmation for 50% of cases.

In summary, our evaluation has shown that specifically early medical-forensic examination of both victim and suspect can secure numerous medical findings that can be extremely important for preliminary investigation and judicial proceedings. Since extra-genital injuries were predominantly found during the examination as compared to anal-genital injuries and since these injuries can confirm

the victim's testimony, a complete physical examination is strongly advisable.

A high percentage of both victims and suspects were under the influence of alcohol at the time of the assault. Mentally and/or physically handicapped persons and persons with a psychiatric disorder made up a relatively high proportion of the victims, so that the risk for this group to become a victim of sexual assault could be regarded as increased.

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