

Original Research

An analysis of women victims of sexual violence in one area in Republic of Korea

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Abstract

Background: This study analyzed the characteristics of sexual violence against women that occurred in one area in Republic of Korea. **Methods:** The medical records of 332 women who visited Emergency Unit, tertiary university Hospital with sexual violence as main complaint from Jun. 2007 to Oct. 2016 and were examined by obstetricians and gynecologists were reviewed retrospectively. **Results:** Most of victims were in their 20s. 79.5% of victims had sexual experience before case and this rate in adolescent group aged from 13 to 20 was 65.2%. 52.1% of cases occurred under influence of alcohol and 52.1% of victims had hepatitis B antibody. The most frequent condition of sexual violence in the age group of victims over 13 years old were Jun.–Aug., 0:00–6:00, stranger, and accommodation facility. Those conditions in victims under 13 years old were Sep.–Nov., 12:00–18:00, outdoor, and acquaintance. The follow-up rate after examination was performed in 40.1% of victims. **Conclusions:** This study showed that sexual violence against child has different characteristics with that general sexual violence. The low rate of carrying hepatitis B antibody in victims indicated the importance of vaccine inoculation and further studies are recommended to obtain statistical significance of the results in this study.

Keywords: Sexual violence victim; Epidemiology; Hepatitis B

1. Introduction

The sexual violence is an umbrella term that refers both violent acts that cause sexual harm psychologically, physically, and illegally to others and the sexual approaches against the other party's will. The sexual assault and forced indecent are representative cases of sexual violence, and also include quasi-rape and quasi-indecent act by compulsion, which commit crimes using victim's state of insanity or inability to protest. The rape, also called sexual assault, means forced sexual insertion without consent of the other party. The Korean Criminal Law, article 297 and 297-2 define rape and imitative rape, respectively. A person who committed rape, under Korean Criminal Law, article 297, shall be punished by imprisonment for a limited term of at least three years. A person who inserts one's sexual organ into another's mouth or anus, or inserts one's finger or other bodily part or any instrument into another's genital organ or anus shall be subjected to imitative rape and punished by imprisonment for a limited term of at least two years. The punishments for quasi-rape and quasi-indecent act by compulsion are same for that of rape and indecent act by compulsion, and any attempted criminals are also punished. The crime to compliant for sexual crimes was abolished in June, 2013, and the victim of rape has been revised from 'women' to 'people' to include the sex crimes against man into the subject of punishment.

A person who has sexual intercourse with whom under thirteen years of age is punished as rape regardless of the earlier consent of victim. Any person who commits rape

against under nineteen years of age is under the Act on the Protection of Children and Juveniles from Sexual Abuse, article 7, punished by imprisonment with labor for an indefinite term or for at least five years, and rape against under thirteen years of age punished by imprisonment with labor for an indefinite term or for at least five years, respectively [1].

As of 2014, the data reported by investigation agencies such as Prosecution Service, Korean National Police Agency, and Special Judicial Police showed that the number of cases of sexual violence in Korea has been steadily increasing since 2005. The number of sexual violence crime was reported to increase from 11,757 in 2005 to 22,034 in 2013 and 29,863 in 2014, indicating that, even after the Special Act on the Punishment of Sexual Crimes was enacted in 2013, the crime rate continues to increase. Sexual violence against minors increased 3.3 times from 2904 cases in 2005 to 9530 cases in 2014, and as of 2014, 31.9% of the total number of sexual violence were against minors [2]. Given that the hidden crime rate of sexual violence is 87.5%, the actual number of sexual assault crime is estimated to be more than six times [3].

Sexual crime victims may contact the police (112), region one-stop support Centers, emergency telephone for women (1366 without area code), Korean Sexual Violence Counseling Center, and the Sunflower Center, and is eligible to receive medical support from a dedicated medical institution. The primary role of a dedicated medical institution is to collect evidence and include sexually transmitted



infections test, pregnancy reaction test, treatment of physical injury, prescribing prophylactic antibiotics and contraceptives, and psychiatric support. Evidence collected by a physician when the victim of sexual violence visits the hospital is an important legal data for punishment of the perpetrator, and is collected, using a standardized 'emergency kit for victim of sexual violence', with the consent of the victim. The 'emergency kit for victim of sexual violence' was developed for the purpose of facilitating the collection of evidence of sexual violence from the victim, and consists of necessary tools to collect evidence by stages and a checklist form to simplify the investigation process. Items include paper bags of various sizes to keep the victim's underwear or foreign objects, sterile cotton swab, slide, tube for blood collection, and nail clippers. The evidences collected in the dedicated medical institution using the kit is handed over to an investigative agency. The case is sent to the prosecutor's office based on the results of the investigation of the evidences by the National Institute for Scientific Investigation, and the court ultimately decides the guilt or innocence.

As of 2016, there are 348 dedicated medical institutions for sexual violence victims nationally. The most common department is obstetrics and gynecology, occupying 235 institutions including general hospitals ($n = 82$) and private obstetrics and gynecology clinics ($n = 153$), and other departments such as neuropsychiatry (47) and public health centers (21) have also been designated as dedicated medical institution.

The purpose of this study was to investigate the actual status and characteristics of sexual violence committed in one area in Republic of Korea, and to discuss the points to be considered in treating victim of sexual violence by analyzing the medical records of patients who visited a university hospital located in one area in Republic of Korea with sexual violence as main complaint.

2. Subjects & method

2.1 Subjects

The population of this study was women victim of sexual violence who visited the emergency unit of tertiary university hospital located in one area in Republic of Korea with sexual violence or rape as main complaint from Jun. 1, 2007 to Oct. 20, 2016. During this period, a total of 342 patients visited the emergency unit with sexual violence as main complaint, and 332 of them were included in this study after excluding two man victims and eight patients with poor records.

2.2 Method

This study investigated, based on medical records of the 332 women victims of sexual violence who visited the emergency unit of tertiary university hospital located in one area in Republic of Korea, investigated characteristics related to sexual violence victim and sexual violence cases,

sperm detection, pregnancy reaction test, vaginal discharge test, and revisit rate. The characteristics related to sexual violence victim included age, sexual intercourse experience before the case, alcohol consumption at the time of the case, the time taken to visit the hospital after the sexual violence, and the presence of the hepatitis B antibody. The characteristics related to sexual violence included the time, season, place, the relationship between the victim and the perpetrator, the number of perpetrators, and the method of the sexual violence. In addition, the victims were classified into three groups by their ages of children under 13 years old, adolescents between 13 and 20 years old, and adults over 20 years old ("child group", "adolescent group", and "adult group", respectively) in order to compare the characteristics related to case by age group.

All women victims of sexual violence who visited the emergency unit were examined by obstetricians and gynecologists and inquiry, physical examinations, and evidence collections were performed under the presence of female nurse. The evidences were collected using the 'emergency kit for victim of sexual violence', and blood test, vaginal discharge test, and urine test were performed to check pregnancy, sexually transmitted disease infections, and semen detection. The wet smear and acid phosphatase tests were performed to test sperm detection, and empirical antibiotics for sexually transmitted diseases and postcoital contraceptives were prescribed to all patients before their discharge. Ceftriaxone (Boryung Pharm, Seoul, Republic of Korea) 2 g was injected intravenously as a prophylactic antibiotic for sexually transmitted diseases and they were instructed to take Cefixime (Hanmi Pharm, Seoul, Republic of Korea) 100 mg twice a day and Metronidazole (HK inno.N, Seoul, Republic of Korea) 250 mg three times a day for three days after discharge. Levonorgestrel 1.5 mg (Nor-Levo[®]; HRA Pharma, Paris, France) before July, 2014 and Ulipristal 30 mg (Ellaone[®]; HRA Pharma, Paris, France) after July, 2014, were prescribed to all patients. To prevent tetanus, tetanus immunoglobulin (Hypertet 250 IU; Yongin, Republic of Korea) and vaccine (Td pur inj. 0.5 mL; Novartis Vaccines & Diagnostics GmbH & Co., Marburg, Germany) were injected, and Hepatitis B vaccine (Hepavax-Gene TF1 mL; GreenCross, Seoul, Republic of Korea) was inoculated to those without Hepatitis B antibody. The victims, after all the inquiries and examinations were completed, were instructed to visit the obstetrics and gynecology outpatient clinic after one week for the confirmation of the test results and additional treatment.

For the statistics, the variables related to victim and case, and outcome variables were summarized and presented as frequency and percentage. The victims were classified into three groups by their ages (>13 , $13-20$, $20<$) and the general characteristics, variables related to sexual violence, and outcome variables were summarized and presented as frequency and percentage by groups. To test whether there was a statistically significant difference

among, a chi-square test or Fisher's exact test was performed according to the proportion of cells with an expected frequency less than five. For the variables found to be significantly different among groups, a post-test was performed after Bonferroni's correction. Missing values were not replaced and regarded as non-response.

For the two-sided test, $p < 0.05$ was considered statistically significant. All statistical analyses were performed with SPSS (version 14.0; SPSS Inc., Chicago, IL, USA) and R (version 3.1.3; The R Foundation for Statistical Computing, Vienna, Austria).

3. Results

3.1 Characteristics related to sexual violence victim

3.1.1 Victims age

Those under the age of 13 were 21 (6.3%), those ages between 13 and 19 were 86 (25.9%), those in their 20s were 142 (42.8%), being most frequent age group, those in their 30s, 40s, and 50s were 41 (12.3%), 25 (7.5%), and 17 (5.1%), respectively (Table 1).

Table 1. Age distribution of victims.

Age (year)	Total (n = 332)
<13	21 (6.3%)
13–19	86 (25.9%)
20–29	142 (42.8%)
30–39	41 (12.3%)
40–49	25 (7.5%)
≥50	17 (5.1%)

The data were reported as number (percentage).

3.1.2 Sexual experience before case

264 (79.5%) from total victims had sexual experiences before case. By age group, four (19.0%) victims from child group, 56 (65.1%) from adolescent group, and adult group 205 (91.0%).

3.1.3 Alcohol consumption at the time of case

173 (52.1%) victims were shown to be under influence of alcohol at the time of case. By age groups, two (9.5%) were from child group, 40 (46.5%) were from adolescent group, 131 were from adult group (58.2%) (Table 2).

3.1.4 Time taken to visit hospital after sexual violence

280 (84.5%) victims visited hospital within 24 hours after the case, 40 (12.0%) within 72 hours, 10 (3.0%) longer than 72 hours after case, and two (0.6%) unknown (Table 2).

3.1.5 Presence of hepatitis B antibody

By the blood test performed at the emergency unit, the hepatitis B antibody was found in 168 (50.6%) victims

and remain (n = 150, 45.2%) had no antibody. 14 (4.12%) victims were not tested. By age groups 11 (52.4%) victims from child group, 45 (52.3%) victims from adolescent group, and 94 (41.8%) from adult group were shown to have no hepatitis B antibody (Table 2).

3.2 Characteristics related to sexual violence

3.2.1 Time of occurrence

The most frequent time of occurrence was 0:00–6:00 (n = 166, 50%), and 34 (10.2) victims were unable to remember the time due to alcohol consumption. The most frequent time by age groups were 12:00–18:00 (n = 8, 38.1%) for child group, 0:00–6:00 (n = 32, 37.2%) and 18:00–24:00 (n = 23, 26.7%) for adolescent group, and 0:00–6:00 (n = 131, 58.2%) and 18:00–24:00 (n = 39, 17.3%) for adult (Table 3).

3.2.2 Season of occurrence

The most frequent season of occurrence was Jun.–Aug. (n = 109, 32.8%) and was followed by Sep.–Nov. (n = 104, 31.3%), Mar.–May (n = 72, 21.7%), and Dec.–Feb. (n = 47, 14.2%). By age group, it was Sep.–Nov. (n = 13, 61.9%) for child group and Jun.–Aug. for adolescent and adult group (Table 3).

3.2.3 Place of occurrence

The most frequent place of occurrence was accommodation facility (n = 121, 36.4%) and was followed by victim's or perpetrator's house (n = 102; 30.8%), outdoor, karaoke, or bar (n = 61, 18.4%), and inside car (n = 19, 5.7%). 29 (8.7%) victims left no record on place or were unable to remember due to alcohol consumption. By age group, it was outdoor such as rooftops of apartment or toilets (n = 9, 42.9%) for child group and accommodation facility for both adolescent and adult group (Table 3).

3.2.4 Relationship between victim and perpetrator

Many of perpetrators (n = 151, 45.5%) were stranger and was followed by acquaintance (n = 107, 32.3%), friend or lover (n = 19, 5.75), and relative (n = 7, 2.1%). 48 (8.7%) victims left no record on relationship or were unable to remember due to alcohol consumption. Unlike overall profile, the most common relationship for child group was acquaintance (n = 9, 42.9%) (Table 3).

3.2.5 Number of perpetrator

In most of cases (n = 305, 91.9%), the number of perpetrator was one. Two and three or more perpetrators were reported in 14 (4.2%) and five (1.5%) cases. Eight (2.4%) victims was unable to remember the number of perpetrator due to their heavy drink. The rate of cases with two or more perpetrators in child group was 12.8% (n = 11), higher compared to that in other age groups (Table 3).

Table 2. Characteristics of sexual victim.

Variables	Total	Age (year)		<i>p</i> -value
	(n = 332)	<13 (n = 21)	13–19 (n = 86)	
Sexual experience				<0.001
Yes	265 (79.5%)	4 (19.0%)	56 (65.1%)	205 (91.1%)
No	64 (19.6%)	17 (81.0%)	28 (32.6%)	19 (8.5%)
Unknown	3 (0.9%)	0 (0.0%)	2 (2.3%)	1 (0.4%)
Victim's drinking status				<0.001
Yes	173 (52.1%)	2 (9.5%)	40 (46.5%)	131 (58.2%)
No	159 (47.9%)	19 (90.5%)	46 (53.5%)	94 (41.8%)
Time to visit				0.083
The day of assault	280 (84.3%)	17 (81.0%)	70 (81.4%)	193 (85.8%)
Within 3 days	40 (12.0%)	2 (9.5%)	14 (16.3%)	24 (10.7%)
Within 7 days	10 (3.0%)	1 (4.8%)	1 (1.2%)	8 (3.6%)
Unknown	2 (0.6%)	1 (4.8%)	1 (1.2%)	0 (0.0%)
HBsAb				0.304
Positive	168 (50.6%)	9 (42.9%)	36 (41.9%)	123 (54.7%)
Negative	150 (45.2%)	11 (52.4%)	45 (52.3%)	94 (41.8%)
No tested	14 (4.2%)	1 (4.8%)	5 (5.8%)	8 (3.6%)

The data were reported as number (percentage).

p-values were calculated by chi-square test or Fisher's exact test.

HBsAb, hepatitis B surface antibody.

3.2.6 Types of sexual violence

The most common type of sexual violence was vaginal sex (n = 264, 79.5%), and was followed by insertion of instrument or finger (n = 42, 12.6%), oral sex (n = 36, 10.85), and anal sex (n = 7, 2.1%). The most common type in child group was oral sex (n = 5, 23.85), being higher rate compared to that of adolescent group (n = 10, 11.6%) and adult group (n = 21, 9.3%) (Table 3).

3.3 Sperm detection and pregnancy reaction test

The sperm was detected in 68 (20.5%) victims and six (1.8%) victims showed positive reaction in pregnancy test. Two of those who had positive reaction were pregnant and one had miscarriage 10 days before case. Remaining three victims were unaware of their pregnancy and did not revisited though outpatient follow-ups were needed (Table 4).

Among those excluding 20 (6.0%) victims who were not subjected to vaginal discharge test used to check for sexually transmitted infections, 139 (41.9%) victims were shown to have bacteria, but there were no sexually transmitted bacteria such as *Trichomonas* or *Chlamydia*. The most frequently detected bacteria in the test was *Escherichia coli* (n = 65, 19.6%) and was followed by *Staphylococcus* (n = 31, 9.3%), *Streptococcus* (n = 23, 6.9%), *Enterococcus* (n = 8, 2.4%), *Candida* (n = 4, 1.2%), *Klebsiella pneumonia* (n = 4, 1.2%), and *Sphingomonas* (n = 1, 0.3%). In addition, no cases of diagnosis with syphilis or AIDS were reported during this study period.

3.4 Follow-up

133 (40.1%) victims revisited the hospital for follow-up. By age group, 10 (47.6%) victims from child group, 33 (38.4%) victims from adolescent group, and 90 (40.0%) victims from adult group revisited for test result check, additional treatment, issue of medical certification, and others (Table 4).

4. Discussion

This study compared the characteristics of cases by age groups by classifying victims into three groups of child group under 13 years old (n = 21, 6.3%), adolescent group between 13 and 20 years old (n = 86, 25.9%), and adult group over 20 years old (n = 225, 67.8%). The largest age group was in their 20s (n = 142, 42.8%) and was followed by adolescent group (n = 86, 25.9%) (Table 1).

In this study, the overall rate of victims under influence of alcohol at the time of case was 52.1% (n = 173), and this rate for adolescent victims was 46.5% (n = 40). 26 victims (66.7%) from 39 ones without record about types of sexual violence were unable to remember that moment due to influence of alcohol. Jänisch *et al.* [4] reported that alcohol is the most commonly used material in date rape. In the case of a quasi-rape in which the victim was sexually assaulted in a state of inability to protest such as heavy drinking, and especially when the victim is unconscious, the drug detection test may be considered.

It has been reported that sexual violence occurs most frequently in the summer from Jun. to Aug. [5], and in this study, the cases occurring in summer from Jun. to Aug. ac-

Table 3. Characteristics of sexual assault.

Variables	Total	Age (year)			p-value
	(n = 332)	<13 (n = 21)	13–19 (n = 86)	≥20 (n = 225)	
Time of day					<0.001
00:00–05:59	166 (50.0%)	3 (14.3%)	32 (37.2%)	131 (58.2%)	
06:00–11:59	49 (14.8%)	2 (9.5%)	12 (14.0%)	35 (15.6%)	
12:00–17:59	34 (10.2%)	8 (38.1%)	11 (12.8%)	15 (6.7%)	
18:00–23:59	67 (20.2%)	5 (23.8%)	23 (26.7%)	39 (17.3%)	
Unknown	16 (4.8%)	3 (14.3%)	8 (9.3%)	5 (2.2%)	
Season					0.032
Winter (Dec.–Feb.)	47 (14.2%)	0 (0.0%)	13 (15.1%)	34 (15.1%)	
Spring (Mar.–May)	72 (21.7%)	3 (14.3%)	14 (16.3%)	55 (24.4%)	
Summer (Jun.–Aug.)	109 (32.8%)	5 (23.8%)	33 (38.4%)	71 (31.6%)	
Fall (Sep.–Nov.)	104 (31.3%)	13 (61.9%)	26 (30.2%)	65 (28.9%)	
Place					0.006
Victim's home	51 (15.4%)	4 (19.0%)	8 (9.3%)	39 (17.3%)	
Assailant's home	51 (15.4%)	6 (28.6%)	12 (14.0%)	33 (14.7%)	
Hotel or motel	121 (36.4%)	1 (4.8%)	34 (39.5%)	86 (38.2%)	
Outside	61 (18.4%)	9 (42.9%)	16 (18.6%)	36 (16.0%)	
Car	19 (5.7%)	0 (0.0%)	9 (10.5%)	10 (4.4%)	
Unknown	29 (8.7%)	1 (4.8%)	7 (8.1%)	21 (9.3%)	
Relationship to victims					0.001
Stranger	151 (45.5%)	7 (33.3%)	37 (43.0%)	107 (47.6%)	
Acquaintance	107 (32.2%)	9 (42.9%)	34 (39.5%)	64 (28.4%)	
Friends or partner	19 (5.7%)	0 (0.0%)	2 (2.3%)	17 (7.6%)	
Relatives	7 (2.1%)	3 (14.3%)	2 (2.3%)	2 (0.9%)	
Unknown	48 (14.5%)	2 (9.5%)	11 (12.8%)	35 (15.6%)	
No. of assailants					0.048
1	305 (91.9%)	19 (90.5%)	70 (81.4%)	216 (96.0%)	
2	14 (4.2%)	1 (4.8%)	8 (9.3%)	5 (2.2%)	
More than 3	5 (1.5%)	1 (4.8%)	3 (3.5%)	1 (0.4%)	
Unknown	8 (2.4%)	0 (0.0%)	5 (6.0%)	3 (1.3%)	
Assault method*					0.12
Oral	36 (10.8%)	5 (23.8%)	10 (11.6%)	21 (9.3%)	0.12
Genitals	264 (79.5%)	17 (81.0%)	72 (83.7%)	175 (77.8%)	0.502
Anus	7 (2.1%)	1 (4.8%)	1 (1.2%)	5 (2.2%)	0.576
Utensil/Finger	41 (12.3%)	4 (19.0%)	9 (10.5%)	28 (12.4%)	0.788
Unknown	39 (11.7%)	2 (9.5%)	10 (11.6%)	27 (12.0%)	0.944

The data were reported as number (percentage).

p-values were calculated by chi-square test or Fisher's exact test.

*Respondents could choose more than one option.

counted for 32.8%, higher than that of other seasons. The most frequent time of occurring sexual violence was dawn time from 0:00 to 6:00 in both adolescent and adult groups, occupying 37.2% and 58.2%, respectively, being consistent with the results of study on other region study [5–7]. A previous study that analyzed the medical records of 70 patients who visited the emergency unit of tertiary university hospital located in one area in Republic of Korea for sexual violence from April 2001 to May 2006 with sexual violence as main complaint, showed that the most frequent conditions for sexual violence were summer (61.4%), evening (25.7%) and night (45.7%), being consistent with result of this study

[8]. The most frequent (38.1%) time in child group was 12:00–18:00. This is consistent with the results that most frequent time of occurring sexual violence toward children was 14:00–18:00 in a study on other region [5] and was 12:00–14:00 and 16:00–19:00 in a study on another region [9]. The reason of these differences in the time of occurring sexual violence among age groups was that children and infants have lower risk of being exposed to crime during night or early morning and higher risk at daytime because of coming home from school.

The rates of occurring in accommodate facility were 39.5% and 38.2% for adolescent and adult groups, respec-

Table 4. Test results and follow-up rate.

Variables	Total		Age (year)		p-value
	(n = 332)	<13 (n = 21)	13–19 (n = 86)	≥20 (n = 225)	
Pregnancy test					0.518
Positive	6 (1.8%)	0 (0.0%)	1 (1.2%)	5 (2.2%)	
Negative	309 (93.1%)	19 (90.5%)	83 (96.5%)	207 (92.0%)	
No tested	17 (5.1%)	2 (9.5%)	2 (2.3%)	13 (5.8%)	
Sperm test					0.508
Positive	68 (20.5%)	3 (14.3%)	18 (20.9%)	47 (20.9%)	
Negative	211 (63.6%)	12 (57.1%)	53 (61.6%)	146 (64.9%)	
No tested	53 (16.0%)	6 (28.6%)	15 (17.4%)	32 (14.2%)	
Follow-up					0.74
Yes	133 (40.1%)	10 (47.6%)	33 (38.4%)	90 (40.0%)	
No	199 (59.9%)	11 (52.4%)	53 (61.6%)	135 (60.0%)	

The data were reported as number (percentage).

p-values were calculated by chi-square test or Fisher's exact test.

tively, in this study. 42.9% of cases where the victims are under the age of 13 occurred at outside places such as apartment, rooftops, toilet, and academies. The studies in other regions [5,7] reported that 31.9% and 25.1% of sexual violence occurred at victim's home, being inconsistent with the result of this study. A study on one area in Republic of Korea from 2001 to 2005 also reported that the most common places of occurring sexual violence were victim's home (32.9%) and accommodation facility (28.6%) [8]. Another study [6] reported that the most common place of occurring sexual violence was hotel or motel when victim was adolescent and victim's home when victim was in other age group. The hotel or motel were also places where sexual violence occurred he most in this study for both adolescent and adult groups, necessitating further studies on this theme.

For the relationship with perpetrator, the stranger occupied 66.7% and 55.4% in other studies [6,7], and in this study, stranger or a person whom the victim met for the first time accounted for 45.5%. In particular, victims in their 10s and 20s were likely to be raped by someone they met for the first time through cell phone application, internet chatting, or at bar [6,7]. The Korean Sexual Violence Counseling Center reported in 2015 that the acquaintance was perpetrator in 78.4% of all 1308 sexual violence counseling cases, being inconsistent with result of this study. Other studies showed that when the perpetrator was acquaintance, most of them were those from work in adult victims [10], those from school or academies in adolescent victims [11], and relatives in child victims [12], being consistent with the results of this study. In this study, most of perpetrators were father, brother, or step-brother in child victims and teacher, acquaintance older than victim, someone they met through chatting application in adolescent victims. Notably, among 42 middle-aged women older than 40 years old, six were sexually committed by customer at bar or restaurant they were operating and three were raped by ex-husband or lover. Adult women were reported to be more

likely to be sexually assaulted by their spouse or ex-spouse [13]. One victim in this study, for example, was consistently sexually committed by her ex-husband in the oral, genitals, and anus, and visited emergency unit complaining that it is hard to sit down due to fecal incontinence and anal pain.

The cases with two or more perpetrators are classified as group sexual violence. A 2013 study analyzed 25-year criminal records in the US and Europe and reported that 10–20% of sexual assault were group rape [14]. It was reported that the perpetrators of group sexual violence were likely to be younger and to use alcohol or drugs and that victims were suffered from severe physical and psychological damages [10,11]. In this study, 19 (5.7%) victims were sexually committed by two or more perpetrators, and 11 of them were adolescents. Even two children under 13 years old were victims of group sexual violence. A 12 years old girl, for example, was sexually committed by oral, genital, and anal sex after drinking with a boy older than her and seven friends. She visited emergency unit 48 hours after the case. 15 from 19 victims of group sexual violence were under influence of alcohol, and two of them went to psychiatry for anxiety disorders.

The results of vaginal discharge showed that the *Klebsiella pneumoniae* was detected in four victims and two of them were positive in the pregnancy test. *Klebsiella pneumoniae* is known to be the main cause of pneumonia and, in addition to respiratory tract, may cause urinary tract infections. This is also known to be strongly related to premature labor in vaginal infections [15]. In this study, *Klebsiella pneumoniae* was detected in two victims with positive in pregnancy test. They showed no special in the urine test. Both did not revisited though they were required to receive additional examination.

The sexually transmitted disease test for victims of sexually violence include HIV, hepatitis B, and syphilis and the U.S. Centers for Disease Control and Prevention in 2015

added tests for chlamydia, gonorrhea, and trichomonas infections. According to the guidelines for the treatment of sexually transmitted diseases published by U.S. Centers for Disease Control and Prevention in 2015 though there may be slight difference among hospitals, the standard treatment for gonococcus and chlamydia is one oral administration of Ceftriaxone 250 mg intramuscularly and 1 g of Azithromycin (Pfizer Inc., New York, NY, USA). As a prevention of infection with Trichomonas, Metronidazole 2 g is administered once orally. Those who have no hepatitis B antibodies should be inoculated with hepatitis B vaccine and additional vaccinations should be given after one and six months [16]. For those with history of exposure to HIV (Human Immunodeficiency Virus), antiviral drugs should be administered within four hours of the occurrence of sexual violence, though it should not be administered if more than 72 hours have passed. The fact that anal sex or group rape increases the risk of HIV infection should be considered during the interview [17]. The human papillomavirus (HPV) vaccine is recommended for women victims aged 9 to 26 years and men victims aged 9 to 21 years and booster vaccination after one and six months are needed. Although the likelihood of being pregnant due to rape depends on the menstrual cycle of victim, all victims should take emergency contraceptives. Ulipristal (HRA Pharma, Paris, France) and Levonorgestrel (HRA Pharma, Paris, France) are used as emergency contraceptives. Ulipristal is effective up to 120 hours after intercourse and is recommended particularly when 72 hours after ejaculation have been passed or for obese women. Levonorgestrel (0.75 mg twice every 12 hours, or 1.5 mg once) is widely used because of less side effects, and its effect is expected when it is taken within 72 hours and the effect is less for obese women.

The hepatitis B antibody vaccination is one of the mandatory vaccinations in Korea, and according to the statistics published by the Korea Disease Control and Prevention Agency, 94.3% of 480,000 children born in 2012 completed three hepatitis B vaccinations [18]. It is known that more than 90% of those who have been vaccinated with hepatitis B vaccine three times have antibody. In this study, 168 (50.6%) victims of sexual violence who visited the hospital had hepatitis B antibodies. In particular, 11 (52.4%) victims from children group and 45 (52.3%) victims from adolescent who did not carry hepatitis B antibodies are required to be vaccinated with Hepatitis B vaccination and additional booster vaccinations in outpatient setting. Discussion on the hepatitis B antibody retention rate and sexual violence victims has not been reported in Korea, meaning that further studies should be conducted based on data from each dedicated medical institution for sexual violence victims.

Victims of sexual violence are at higher risk of pregnancy or being exposed to sexually transmitted infections, thus are required follow-up. The World Health Organiza-

tion (WHO) recommends for the victims of sexual violence to visit hospital three times, one to two weeks, three months, and six months after the case. When the victims revisit hospital one or two weeks after the case, the results of the test conducted at first visit are explained, and if necessary, a picture of the injured part is taken. The victims who have not taken prophylactic antibiotics are tested for sexually transmitted infections and, if necessary, a pregnancy test is performed. The victims who did not carry hepatitis B antibody should be given with explanation on the need for hepatitis B vaccination at first visit and after 1 month and 6 months. When three months have been passed after the case, HIV test and pregnancy test are required and those who have not taken prophylactic antibiotics should be tested for syphilis. Six months after the case, HIV test and hepatitis B vaccination should be performed [19]. A study that investigated the follow-up treatment rate of victims of sexual violence reported that the actual follow-up treatment rate was around 31% [20], and Korean previous reports reported follow-up treatment rate was 11.3% [11], 11.6% [21], and 28.7% [6], which were lower than others. The antibiotics and contraceptives were also prescribed to victims who visited emergency unit in this study and were educated to re-visit the obstetrics and gynecology after one week, only 133 from 332 victims (40.1%) revisited, which is similar to 42.9% reported in a study from 2001–2005 [8]. Although this rate is relatively higher compared to those in other regions, education on the need for revisiting to manage physical and mental sequela in the future should be conducted more actively.

Many of sexual violence victims complain of post-traumatic stress disorder, anxiety, and depression and, in severe cases, suicide is attempted [22]. In addition, they suffered from insomnia, anorexia, and nightmares, making them to return to normal life [23]. It is recommended to start psychiatric counseling in earlier time and follow-up psychiatric as well as obstetrics and gynecology examination should be performed one or two weeks after the visit [24]. The psychiatric follow-up examination rates were reported as 5.4% [6] and 13.5% [5], and in this study, only one patient was followed up as receiving psychiatric treatment at same hospital. The physicians, in treating victims of sexual violence, should pay attention so that they visit not only obstetrics, but also psychiatry.

The victims in this study were those who visited the emergency unit in person or with accompanying police, and when the emergency unit contacted the obstetrics and gynecology department, they knew that the patients is a victim of sexual violence and practiced examination accordingly. It can be reasonably expect that, however, there are a number of victims of sexual violence who visited the emergency unit for vaginal bleeding or trauma, without reporting the fact of sexual violence and thus were overlooked. In particular, children are likely to be unaware that they have been sexually committed and the perpetrator is often a relative

[11], meaning that the crime is often concealed. Sexual violence against children is defined as “rape or forced indecent against persons under the age of 13”, and even with the consent of the victim, all sexual acts against children are regarded sexual violence. For a child who visits the emergency unit with the vaginal bleeding or trauma to the vulva as complaint, the obstetrician and gynecologist should always take care of the possibility of sexual violence in mind.

5. Conclusions

No previous domestic studies on sexual violence, in their reports, subdivided the number of perpetrators, rate of carrying hepatitis B antibody in victims of sexual experience before case. In this study, the overall rate of carrying hepatitis B antibody in victims of sexual violence was 50.6%, and 65.1% of adolescent victims reported previous sexual experience. Further epidemiological studies, based on accumulated data of each dedicated medical institution for sexual violence victims, are necessary in order to derive statistically significant results. In addition, it is suggested that doctors who exam victims of sexual violence should be familiar with the kinds of medical examination for victims of sexual violence, and should pay careful attention not only for collecting legal evidence but also, from medical perspective, for physical and psychological treatment of them.

Author contributions

GEH performed the research and analyzed the data. JHS wrote the manuscript and reviewed relevant literature. THK designed the research study. HHL reviewed relevant literature and revised the manuscript. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate

The article does not contain any studies with human participant or animal performed by any of the authors.

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Conflict of interest

The authors declare no conflict of interest. THK is our Guest Editor, given his role as Guest Editor, had no involvement in the peer-review of this article and has no access to information regarding its peer-review.

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