

# Medicolegal Analysis of Reports of Suspected Sexually Abused Children Examined in Omdurman Mortuary (Sudan)

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## Abstract

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**Background:** A serious public health issue that affects children and families is referred to by the interchangeable phrases child abuse and neglect, child maltreatment, and child victimization. **Objective:** To analyze 442 reports of suspected sexually abused children (SSAC) examined in Omdurman (2015-2019) regarding patterns of injuries, mechanisms and causes of death, mortality rate and relationship between SSAC and alleged suspect. **Methods:** This retrospective study was carried out on data retrieved from reports of SSAC. **Results:** Year 2017 received the highest percentage of cases. The most common age group was between 5 years<10 years. 62.9% of SSAC were female. The most common type of sexual abuse was vaginal. 87.8% of cases had no relation with the alleged offender. Contusions were the most frequent general injuries. Head injuries were the most frequent regional injuries. Old tear of hymen and posterior fourchette were the most frequent local injuries. The highest mortality rate was in 2015. The most common mechanism of death was anoxic anoxia and the most common cause of death was blunt head Injuries. **Conclusion:** The highest percentage of cases was in 2017. The most common age group was between 5years<10years. Females were the most common sex. Most of SSAC had no relation with their alleged offender. Contusions and head injuries were the most frequent general and regional injuries respectively. Old tear of hymen and posterior fourchette were the most frequent local injuries. The highest mortality rate was in 2015. The most common mechanism of death was anoxic anoxia and the most common cause of death was blunt head Injuries.

## Key words

Medicolegal Analysis; Omdurman; Sexually Abused Children

## Introduction

The most valuable resource in a country is its children. A society's ability to thrive and progress is constantly dependent on its youth. They are a socially vulnerable group. In many nations, particularly developing ones, child sexual abuse (CSA) is a widespread but mainly unacknowledged issue that is growing horribly common in schools (Belur and Singh, 2015).

Child sexual abuse (CSA) is a global issue that is subtle, enduring, and grave, affecting 2–62% of women and 3–16% of males as victims. The physiological and psychological effects may last throughout adulthood. Suicide attempts and related sexually transmitted infections, such HIV, can be lethal. Since up to 96% of children evaluated for suspected sexual abuse had normal genital and anal tests, all doctors who treat children should be well-versed in medico-legal questioning and examination techniques (Johnson, 2004).

Child sexual abuse is a worldwide public health issue. It is a terrible and horrible event that gravely violates a child's rights to protection and health. Child sexual abuse was considered uncommon and prevalent among the impoverished until the early 1970s. All socioeconomic categories are affected by child sexual abuse, according to experts today. Reports of child

sexual abuse were more than those of other forms of neglect or abuse between 1970 and 1990 as a result of growing public awareness (Putnam, 2003).

Globally, rates of sexual abuse have been shown to range from 3–29% for male children and 7–36% for female children (Modelli et al., 2012). Africa was expected to have the greatest prevalence rate of CSA (34.4%). Though the precise scope of the issue in other regions, including Asia, is unknown; it is most likely considerably more severe (Behere and Mulmule, 2013).

Child sexual abuse is defined as a child's participation in sexual behavior that he or she does not completely appreciate, is unable to offer informed permission to, is not developmentally equipped to give consent to, or breaches societal laws or social taboos. It is an activity in which a kid engages with an adult or another child in order to please or meet their needs. The criminal, due to age or development, is in a position of responsibility, trust, or authority. This may include, but is not limited to, child solicitation or compulsion to engage in any illegal sexual behavior; his/her exploitative use in prostitution; or pornographic performance and materials (Belur and Singh, 2015).

The diagnosis of CSA is challenging and may depend on patient, practitioner, and system variables.

Previous researches have showed possible grave effects if cases of abuse are overlooked, and highlighted a role for ongoing medical education in enhancing the accuracy of diagnosing suspected abuse (Trokel, 2006).

Child sexual abuse is closely linked to a variety of poor physiological, behavioral, and social consequences in survivors, including HIV risk behaviors, mental illnesses, drug misuse, and suicidality. Because there is no research comparing the long-term effects of CSA in male and female survivors, data from the Adverse Childhood Experiences (ACE) Study were utilized to investigate the association between CSA and its severity and the likelihood of these long-term effects. The association between the perpetrator's gender and each result among male CSA victims was also examined (Dube et al., 2005).

There is an absence of peer-reviewed research on child sexual abuse in sub-Saharan Africa (SSA), much of which is restricted to the Republic of South Africa (Lalor, 2004).

### **Aim of the Work**

To analyze the reports of suspected sexually abused children (SSAC) examined in Omdurman mortuary (2015-2019) regarding the patterns of injuries, the mechanisms and causes of death, the mortality rate during the years of this study and the relationship between the sexually abused children and the alleged suspect.

### **Materials and Methods**

This retrospective study was carried out on data retrieved from the medico-legal reports of the SSAC who were examined in Omdurman mortuary, Sudan in the period from the first of January 2015 to the last of December 2019. Omdurman mortuary is considered as an emergency institution that receives dead and living bodies for twenty four hours and in all days of the week for medico-legal purposes including suspected sexually abused children. In spite of the fact that Omdurman mortuary has a certain jurisdiction which is Omdurman city, it's authorized to receive subjects from all over the country because it is a central mortuary and the second after the Khartoum (now called Bashayer) central mortuary. All variables according to a predetermined protocol set by the mortuary for dealing with sexually abused children were considered and analysed statistically for the purpose of this research.

For the purpose of this study, all the children (442) who were examined for sexual abuse in Omdurman mortuary in the period from the first of January 2015 to the last of December 2019 were taken as a sample.

Ethical considerations:

All information retrieved from the reports of the SSAC for the purpose of this study was dealt anonymously and all types of identifiers were avoided. All ethical considerations for this study were approved by the ethical committee of the faculty of medicine-Ain Shams University (No.FWA 000017585) and an official permission was obtained from Omdurman mortuary manager.

Statistical analysis:

Data were gathered, edited, tagged, and put into the IBM SPSS (IBM Corp. Released 2020). IBM SPSS Statistics for Windows, Version 27.0 (Armonk, NY: IBM Corp.). The qualitative variables were reported as numbers and percentages and Chi-square tests were applied in case of testing correlation between two categorical variables.

### **Results**

Table 1 showed that year 2017 received the highest percentage of cases (32%) suspected to be sexually abused.

Table 2 showed that the most common age group examined was between 5 years<10 years (63.8%) while the least examined age group was between 1 day<5 years (12.7%).

In table (3), 62.9% of the SSAC were female children.

The most common type of sexual abuse in the SSAC was vaginal (40.5%) followed by anal (19.5%) as shown in Table 4.

Table 5 showed that 87.8% of the SSAC cases had no relation with their alleged offender and only 1.6% were relatives and 10.6% were neighbors.

Contusions were the most frequent general injuries (29.3%) in the examined children while burn injuries were the least frequent (3.9%) as shown in Table 6.

As shown in Table 7, head injuries were the most frequent regional injuries (36.1%), while the back, eye, and face were the least frequent one (3.3%).

Table 8 showed that old tear of hymen and posterior fourchette were the most frequent pattern of local injuries (10.6% /11.6%) while tear of the perineum was the least frequent one (0.2%).

In Table (9), the highest mortality rate among the examined children was in 2015 (9.5%), and the lowest was in 2017 (2.1%).

The most common mechanism of death was anoxic anoxia (35%) and the most common cause of death was blunt head Injuries (25%) as shown in Table 10.

The study revealed that there was a significant correlation between the age group of the examined children and their sex but there was no significant correlation with the type of sexual abuse (Table 11).

**Table (1): The distribution of the SSAC examined in Omdurman mortuary (2015-2019) according to their number in each year of this study.**

Year	Total	Percentage
2015	42	9.5%
2016	38	8.6%
2017	141	32%
2018	113	25.5%
2019	108	24.4%
<b>Total</b>	<b>442</b>	<b>100%</b>

**Table (2): Age distribution of the SSAC examined in Omdurman mortuary (2015-2019)**

Age group	Number	Percentage
Between 1 day<5 years	56	12.7%
Between 5 years<10 years	282	63.8%
Between 10 years<18 years	104	23.5%
<b>Total</b>	<b>442</b>	<b>100%</b>

**Table (3): Sex distribution of the SSAC examined in Omdurman mortuary (2015-2019)**

Sex	2015	2016	2017	2018	2019	Total
<b>Male children</b>	15 (35.7%)	17 (44.7%)	54 (38.3%)	40 (35.4%)	38 (35.1%)	164 (37.1%)
<b>Female children</b>	27 (64.3%)	21 (55.3%)	87 (61.7%)	73 (64.6%)	70 (64.9%)	278 (62.9%)
<b>Total</b>	<b>42</b>	<b>38</b>	<b>141</b>	<b>113</b>	<b>108</b>	<b>442</b>

**Table (4): The distribution of the SSAC in Omdurman mortuary (2015-2019) according to the types of sexual abuse**

Types of sexual abuse	2015	2016	2017	2018	2019	Total	Percentage(%)
Vaginal	8	13	64	45	49	179	40.5%
Anal	11	3	25	21	26	86	19.5%
Vaginal & anal	12	3	2	15	4	36	8%
None	11	19	50	32	29	141	32%
<b>Total</b>	<b>42</b>	<b>38</b>	<b>141</b>	<b>113</b>	<b>108</b>	<b>442</b>	<b>100%</b>

**Table (5): Relationship distribution of the SSAC examined in Omdurman mortuary (2015-2019) with the suspected offender**

The relationship	2015	2016	2017	2018	2019	Total	Percentage (%)
Relative	1	1	2	2	1	7	1.6%
Neighbour	5	4	15	13	10	47	10.6%
No relation	36	33	124	98	97	388	87.8%

**Table (6): The distribution of the types of general injuries over the bodies of the SSAC examined in Omdurman mortuary (2015-2019)**

Types of general injuries	2015	2016	2017	2018	2019	Total	Percentage (%)
Abrasions	1	3	1	1	3	9	17.7%
Contusions	2	3	3	4	3	15	29.3%
Lacerations	2	--	1	2	3	8	15.7%
Cut wounds	2	1	--	--	1	4	7.9%
Stab wounds	1	3	1	1	1	7	13.7%
Fractures	2	1	1	1	1	6	11.8%
Burn	--	2	--	--	--	2	3.9%
Total						51	100%

**Table (7): The distribution of regional injuries in the SSAC examined in Omdurman mortuary (2015-2019)**

Sites of regional injuries		2015	2016	2017	2018	2019	Total	Percentage (%)		
Head	Scalp	2	--	--	2	4	8	22	13.1%	36.1%
	Skull	1	--	--	1	1	3		5%	
	Brain	1	--	--	1	1	3		5%	
	Meninges	1	--	1	3	3	8		13.1%	
Eye	Conjunctiva	--	1	--	--	--	1	2	1.6%	3.3%
	Eye orbit	--	1	--	--	--	1		1.6%	
Face		--	--	--	1	1	2	2	3.3%	3.3%
Neck	Skin & subcutaneous tissue	3	4	2	2	3	14	19	23%	31.2%
	Cervical spine	--	1	--	--	--	1		1.6%	
	Throat	1	--	--	1	1	3		5%	
	Thyroid cartilage	1	--	--	--	--	1		1.6%	
Chest	Chest wall	1	1	--	2	--	4	8	6.5%	13.1%
	Pericardium	1	--	--	1	--	2		3.3%	
	Heart	1	--	--	1	--	2		3.3%	
Abdomen	Abdominal wall	--	--	1	--	1	2	4	3.3%	6.4
	Liver	--	--	--	--	1	1		1.6%	
	Large intestine	--	--	1	--	--	1		1.6%	
Back		--	1	1	--	--	2	2	3.3%	3.3%
Extremities	Forearm	--	1	--	--	--	1	2	1.6%	3.3%
	Thigh	--	1	--	--	--	1		1.6%	
Total							61	61	100%	100%

**Table (8): The patterns of local findings in the SSAC examined in Omdurman mortuary (2015-2019)**

Patterns of local findings	2015	2016	2017	2018	2019	Total	Percentage(%)
Recent tear of hymen	4	6	22	9	10	51	4.3%
Old tear of hymen	6	8	38	32	42	126	10.6%
Dilatation of vagina	7	10	41	40	50	148	8%
Bruises of vaginal orifice	1	4	2	8	9	24	2%
Gapping of labia majora	6	5	30	23	39	101	8.5%
Fibrosis of labia minora	6	5	30	22	38	99	8.3%
Recent tear of the posterior fourchette	3	6	26	17	11	63	5.3%
Old tear of the posterior fourchette	12	13	39	32	42	138	11.6%
Laceration of the vaginal orifice	1	3	2	1	3	10	0.8%
Abrasions around the vaginal orifice	6	3	15	14	7	45	3.8%
Dilatation of anal canal	9	3	17	25	27	81	6.8%
Bruises of anal orifice	8	2	14	19	17	60	5%
Abrasions around the anal orifice	10	1	23	26	13	73	6.1%
Laceration of the anal orifice	3	2	1	2	4	12	1%
Tear of the perineum	1	-	-	-	1	2	0.2%
Absence of local injuries	11	19	50	50	29	159	13.3%
Total						1192	100%

**Table (9): The mortality rate in the SSAC examined in Omdurman mortuary (2015-2019)**

Year	Number	Dead	Mortality rate
2015	42	4	9.5%
2016	38	2	5.3%
2017	141	3	2.1%
2018	113	5	4.4%
2019	108	6	5.6%

**Table (10): The mechanisms and causes of death in the suspected sexually abused children examined in Omdurman mortuary (2015-2019)**

Mechanisms of death	Frequency	Percentage	Cause of death	Frequency	Percentage
Brain laceration	6	30%	Blunt head Injuries	6	25%
Bleeding	4	20%	Stab in the liver	1	5%
			Skull Injuries	1	5%
			Cut throat	2	10%
Septicaemia	1	5%	Abdominal trauma	1	5%
Cardiac tamponade	2	10%	Stab in the heart	2	10%
Anoxic anoxia	7	35%	Strangulation ligature	2	10%
			Overlying	1	5%
			Smothering	2	5%
			Manual strangulation	2	10%
Total	20	100%	Total	20	100%

**Table (4): The correlation of the age groups to the sex and type of sexual abuse in the SSAC examined in Omdurman mortuary (2015-2019)**

		1day<5 years		5 years<10 years		10 years<18 years		Test value	P-value	Sig.
		No.	%	No.	%	No.	%			
Sex	Male children	27	48.2%	107	37.9%	30	28.8%	6.086*	0.047	S
	Female children	29	51.8%	175	62.1%	74	71.2%			
Type of sexual abuse	Vaginal	22	64.7%	31	62.0%	8	50.0%	1.031*	0.597	NS
	Anal	12	35.3%	19	38.0%	8	50.0%			

## Discussion

The aim of this study was to analyze the reports of SSAC examined in Omdurman mortuary regarding the patterns of injuries, the mechanisms and causes of death, the mortality rate during the years of this study and the relationship between sexually abused children and the alleged offender.

Year 2017 received the highest percentage of cases (32%) suspected to be sexually abused. This might be due to the security liquidity in those years. That could be supported by a study conducted by Kadoda and Hale, (2020) who stated that there was increasing sexual violence including rape during the years 2018 and 2019 (Sudan recent revolution) due to the state of security instability.

The most common age group examined was between 5 years<10 years (63.8%) while the least examined age group was between 1 day<5 years (12.7%). This would agree with the finding that most of the alleged offenders were strangers (87.8%) and this age group is easily persuaded and usually are allowed to go outside their homes. The same was found by Elhassan et al. (2016) in a survey in Khartoum, where they mentioned that, the most targeted age group was from 5-10 years and most of the alleged offenders were non-relatives and they used persuasion to abuse the children. Most of the abuses took place outside in areas near by the children's homes.

In the SSAC, 62.9% of the SSAC were female children. This would agree with worldwide prevalence where Barth et al. (2013) found that in fifty-five studies included 24 countries and in four predefined types of sexual abuse, prevalence estimates ranged from 8 to 31 % for female children and 3 to 17 % for male children. Nine female children and 3 male children out of 100 are victims of forced intercourse.

The most common type of sexual abuse in the SSAC was vaginal (40.5%) followed by anal (19.5%). This might agree with the finding that the female sex was the most targeted by CSA. That would agree with a study carried out by Chiesa and Goldson (2017) where they found that in 18 (58%) of the 31 cases, the type of sexual abuse was vaginal penetration.

In this study, 87.8% of the SSAC cases had no relation with their alleged offender and only 1.6% were relatives and 10.6% were neighbors. This meant that most of the children were sexually abused outside their homes. This might be due to an unsafe environment around their homes due to security issues. Also,

children might not be adequately trained in dealing with strangers. That would be consistent with the findings of Olson et al. (2007), who discovered that child sexual predators employ the communication process of entrapment to attract their victims into an ongoing sexual connection. Certain criminals obtain access to certain groups of youngsters. Once in contact with a youngster, the offender initiates the entrapment cycle, allowing him to communicate with the child and entice him into sexual advances. This was further supported by Rudolph et al. (2018), who discovered that the best way to lower the rate of CSA was for the field of CSA prevention to concentrate on prevention programs that target multiple levels of a child's ecology, specifically potential offenders and protectors (parents, educators, medical professionals, religious leaders, and community members). That may be further supported by Bernheimer and Jones (2013), who discovered that all children should work to develop their communication skills, observation and attentiveness when speaking with strangers, the ability to behave cautiously when interacting with strangers, and the development of self-confidence and confidence in one's own opportunities in order to protect them from sexual abuse.

Contusions were the most frequent general injuries (29.3%) in the examined children while burn injuries were the least frequent one (3.9%). Alempijevic et al. (2007) conducted a research in which he reported that 64 victims (63.4%) had one or more extra-genital injuries, 36 victims (35.6%) had no injuries, and one victim had medical records that were inconclusive. Two victims had lacerations, whereas the majority of injuries (62%), abrasions, and contusions were less common. The assault's physical severity was rated using the Clinical Injury Extent Score. One victim suffered serious injuries, while the remainder (44%) had mild injuries and 18% had moderate ones.

Head injuries were the most frequent regional injuries (36.1%), while the back, eye and face were the least frequent one (3.3%). That meant most injuries were in vital areas. This could be contrasted with a study by Sobh et al. (2020) that found a specific distribution of general injuries without naming specific body organs. He stated that simple wounds accounted for half of physical violence, while serious injuries such as traumatic abortion, infirmities, stab wounds, and firearm injuries accounted for the other half.

Old tear of hymen and posterior fourchette were the most frequent pattern of local injuries (10.6% /11.6%) while tear of the perineum was the least frequent one (0.2%). This was expected because the most targeted sex by CSA is female sex and female children were the most common sex in this study group. The vaginal location is also the most often experienced kind of sexual assault. According to Modelli et al. (2012), the prevalence of sexual abuse has been shown to range from 3 to 29% for male children and 7 to 36% for female children globally. Wihbey (2011) further confirmed this when he stated that an estimated 19.7% of female children and 7.9% of male children worldwide experienced sexual abuse before to the age of 18.

The highest mortality rate amongst the examined children was in the year 2015 (9.5%) and the lowest mortality rate was in the year 2017 (2.1%), there was only 1 child who died during the process of sexual assault. The other 19 children were killed due to serious injuries not directly related to the act of sexual assault. The injuries were found in vital areas such as the head, neck, chest and abdomen. Weapons used were lethal such as solid objects and sharp objects. That reflected the intention of the offender to get rid of the children. That could be supported by Knack et al. (2019) where they found that CSA is a recognised social issue that has been associated with a plethora of adverse outcomes including increased rates of mortality. Beauregard et al. (2020) discovered that sexual killers who murdered their victims had the purpose to do so when compared to offenders who caused multiple physical injuries. Sexual murderers are more prone to use a weapon, even if it is unnecessary. Sexual abuse situations that result in death are neither unintentional or due to situational causes. That is consistent with a research conducted by Healey et al. (2016), who discovered a group of offenders who almost exclusively killed their victims and indicated a fatal intent through their choice of offending behavior. Bourne et al. (2015) found that rape has reached epidemic proportions in Jamaica, with a modest bimodal association between homicide and rape.

The most common mechanism of death found in this study was anoxic anoxia (35%) and the most common cause of death was injury to the brain due to a blunt solid object. That is comparable to Sahil (2021) research, in which he said that a total of 2275 incidents of child sexual assault were documented, with both genders equally harmed. A total of 92 incidents of death were documented as a result of various causes following sexual assault.

There was a significant correlation between the age group of the examined children and their sex but there was no significant correlation with the type of sexual abuse. A similar result was found by Ajduković et al. (2013) where he stated that in Croatia, 10.8% of children experienced some form of sexual abuse (4.8% to 16.5%, depending on the age group) during childhood and 7.7% of children experienced it during the previous year (3.7% to 11.1%, depending on the age group). Sex comparison showed no difference in

the prevalence of contact sexual abuse, whereas more female children than male children experienced non-contact sexual abuse.

## Conclusion

Year 2017 received the highest percentage of cases. The most common age group examined was between 5 years<10 years. Female children were the most common sex. The most common type of sexual abuse was vaginal. Most of the SSAC had no relation with their alleged offender. Contusions were the most frequent general injuries. Head injuries were the most frequent regional injuries. Old tear of hymen and posterior fourchette were the most frequent pattern of local injuries. The highest mortality rate was in the year 2015. The most common mechanism of death was anoxic anoxia and the most common cause of death was blunt head Injuries. There was a significant correlation between the age group of the examined children and their sex.

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## التحليل الطبي الشرعي لتقارير الأطفال الذين تعرضوا للإساءة الجنسية في مشرحة أم درمان (السودان)

عماد أحمد السيد مصطفى<sup>1</sup> و ياسر فؤاد العقيد<sup>2</sup> و صابر مكي حسن فضل

### الملخص العربي

**الخلفية:** تشار إلى مشكلة صحية عامة خطيرة التي تؤثر على الأطفال والأسر بالعبارات المتبادلة: إساءة معاملة الأطفال وإهمالهم، إساءة معاملة الأطفال، ووقوع الأطفال ضحايا.

**الهدف:** لتحليل ٤٤٢ بلاغاً عن أطفال مشتبه في تعرضهم للاعتداء الجنسي (SSAC) تم فحصهم في أم درمان (٢٠١٥-٢٠١٩) فيما يتعلق بأنماط الإصابات وآليات وأسباب الوفاة ومعدل الوفيات والعلاقة بين الأطفال الذين تعرضوا للاعتداء الجنسي والمشتبه به المزعوم.

**طريقة البحث:** أجريت هذه الدراسة الاستراتيجية على البيانات المسترجعة من تقارير الأطفال المشتبه في تعرضهم للاعتداء الجنسي .

**النتائج:** قد استقبل عام ٢٠١٧ أعلى نسبة من الحالات. وكانت الفئة العمرية الأكثر شيوعاً بين ٥ سنوات > ١٠ سنوات. وكانت نسبة ٦٢.٩% من الأطفال المشتبه في تعرضهم للاعتداء الجنسي من الإناث. وكان النوع الأكثر شيوعاً من الاعتداء الجنسي هو المهبل. ولم يكن لـ ٨٧.٨% من الحالات علاقة بالمعتدي المزعوم. وكانت الكدمات هي الإصابات العامة الأكثر شيوعاً. وكانت إصابات الرأس هي الإصابات الموضعية الأكثر شيوعاً. كان التمزق القديم لغشاء البكارة والشوكة الخلفية هو النمط الأكثر شيوعاً للإصابات الموضعية. كان أعلى معدل للوفيات في ٢٠١٥. كانت آلية الوفاة الأكثر شيوعاً هي نقص الأكسجين وكان السبب الأكثر شيوعاً للوفاة هو إصابات الرأس الرضائية .

**الخلاصة:** كانت أعلى نسبة من الحالات في ٢٠١٧. كانت الفئة العمرية الأكثر شيوعاً بين ٥ سنوات < ١٠ سنوات. كانت الإناث أكثر أنواع الجنس شيوعاً. لم يكن لدى معظم الأطفال المشتبه في تعرضهم للاعتداء الجنسي أي علاقة بمرتكب الجريمة المزعوم. كانت الكدمات و إصابات الرأس هي الإصابات العامة و الموضعية الأكثر شيوعاً على التوالي. كان التمزق القديم لغشاء البكارة والشوكة الخلفية من الإصابات الموضعية الأكثر شيوعاً. كان أعلى معدل للوفيات في ٢٠١٥. كانت آلية الوفاة الأكثر شيوعاً هي نقص الأكسجين وكان السبب الأكثر شيوعاً للوفاة هو إصابات الرأس الرضائية.

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