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Clinical Characteristics of Child Trauma and Poisoning Cases Admitted to Forensic Medicine Clinic: A Retrospective Descriptive Study

Adli Tıp Kliniğine Başvuran Çocuk Travma ve Zehirlenme Olgularının Klinik Özellikleri: Retrospektif Tanımlayıcı Çalışma

Abdülkadir İZCİ[a], Ayşe KURTULUŞ DERELİ[b], Kemalettin ACAR[b]

[a]Afyonkarahisar Health Sciences University Faculty of Medicine, Department of Forensic Medicine, Afyonkarahisar, Türkiye
[b]Pamukkale University Faculty of Medicine, Department of Forensic Medicine, Denizli, Türkiye

ABSTRACT Objective: The aim of this study is to make a contribution to the existing literature on effective interventions and measures to prevent child injury. To this end, the clinical characteristics of child trauma and poisoning cases, the events causing injury and the resulting consequences were discussed. **Material and Methods:** All reports of child trauma and poisoning in our archive were included in the study. The injury cases were categorised according to age, gender, type of trauma, injury site and forensic report result. **Results:** The majority (68.7%; n=855) of the 1,244 child trauma and poisoning cases included in the study were male. The majority of injuries were blunt traumas (74%; n=937). Traffic accidents accounted for 60.8% (n=570) of blunt trauma. Non-vehicle traffic accidents, which cause more life-threatening injuries and bone fractures, cause more severe traumas in children. Blunt traumas are mostly seen in the head and neck region (%63.1; n=591), while penetrating injuries are seen in the upper (%31.7; n=53) and lower (%37.7; n=63) extremities. Females (60.2%; n=77) were predominant in poisoning cases. The most common cause of poisoning was corrosive substances below the age of 6 years and drug intoxication above the age of 12 years. **Conclusion:** Traffic accidents and male gender come to the forefront in childhood injuries. Especially non-vehicle traffic accidents may result in more serious injuries. The limitations in physical, cognitive and social development of children make them more prone to injuries. Measures to be taken against traffic accidents, violence against children and poisoning, which frequently cause child injuries, will play a major role in preventing childhood injuries.

Keywords: Childhood injury; traffic accident; poisoning; assault

ÖZET Amaç: Bu çalışmanın amacı, çocuk yaralanmalarını önlemek için alınacak önlemler ile etkin müdahaleler konusunda mevcut literatüre katkıda bulunmaktır. Bu amaçla, çocuk travma ve zehirlenme olgularının klinik özellikleri, travma türleri ve ortaya çıkan sonuçlar tartışılmıştır. Gereç ve Yöntemler: Arşivimizdeki tüm çocuk travma ve zehirlenme raporları çalışmaya dahil edilmiştir. Olgular yaş, cinsiyet, travma tipi, yaralanma bölgesi ve adli rapor sonucuna göre kategorize edilmiştir. Bulgular: Çalışmaya dahil edilen 1.244 çocuk travma ve zehirlenme vakasının çoğunluğu (%68,7; n=855) erkekti. Yaralanmaların çoğunluğunu künt travmalar oluşturmaktadır (%74; n=937). Künt travmaların %60,8'i (n=570) trafik kazalarından kaynaklanmıştır. Araç dışı trafik kazaları daha fazla hayati tehlikeye ve kemik kırığına neden olan ağır travmalara neden olmaktadır. Künt travmalar daha çok baş ve boyun bölgesinde (%63,1; n=591) görülürken, penetran yaralanmalar üst (%31,7; n=53) ve alt (%37,7; n=63) ekstremitelerde görülmektedir. Zehirlenme vakalarında kız çocuklarının (%60,2; n=77) ağırlıkta olduğu görülmüştür. En sık zehirlenme nedeni 6 yaş altında korozif maddeler, 12 yaş üstünde ise ilaç zehirlenmeleridir. Sonuç: Çocukluk çağı yaralanmalarında trafik kazaları ve erkek cinsiyet ön plana çıkmaktadır. Özellikle araç dışı trafik kazaları daha ciddi yaralanmalarla sonuçlanabilmektedir. Çocukların fiziksel, bilişsel ve sosyal gelişimlerindeki sınırlılıklar onları yaralanmalara daha yatkın hale getirmektedir. Çocuk yaralanmalarına sıklıkla neden olan trafik kazaları, çocuğa yönelik şiddet ve zehirlenmelere karşı alınacak önlemler, çocukluk çağı yaralanmalarının önlenmesinde büyük rol oynayacaktır.

Anahtar Kelimeler: Çocukluk çağı yaralanmaları; trafik kazası; zehirlenme; saldırı

Correspondence: Abdülkadir İZCİ
Afyonkarahisar Health Sciences University Faculty of Medicine, Department of Forensic Medicine, Afyonkarahisar, Türkiye
E-mail: drkadirizci@gmail.com

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Children may be exposed to trauma for various reasons such as assault, traffic accidents, poisoning, physical abuse and forensic medical evaluation may be performed. In childhood, traffic accidents are a leading preventable health problems.[1] Limitations in physical, cognitive and social development of children may make them more vulnerable to traffic accidents. Children may have difficulty accurately interpreting various visual and auditory stimuli in traffic accurately. In addition, children's impulsive behaviours during adolescence may lead them to more dangerous and risky behaviours. These reasons have made traffic accidents the leading cause of death among children and young people aged between 5-29 years.[2] It is estimated that 1 child dies in traffic accidents every 4 minutes. Of these deaths, 50% are attributed to motorcycle, bicycle and pedestrian deaths.[3]

According to the World Health Organization (WHO), 1 in 2 children experiences some form of violence every year. Approximately 75% of children aged 2-4 years are regularly exposed to corporal punishment and/or psychological violence by their caregivers every year. In addition, it is reported that 1 out of every 3 students aged 13-15 years has been involved in a physical fight.[4] According to the data of the Turkish Statistical Institute, 61.3% of 217,915 children who came or were brought to the security units as victims of crime in 2023 were trauma cases.[5] These statistics highlight the pervasive nature of violence in children's lives. Children exposed to violence have an increased risk of mental illnesses such as anxiety and posttraumatic stress disorders; high-risk behaviours such as alcohol and substance use, smoking and unsafe sexual life; chronic diseases such as cancer, diabetes and heart diseases; infectious diseases such as Human Immunodeficiency Virus; and social problems such as unsuccessful school life, increased involvement in violence and crime.[4,6] Making effective interventions to prevent violence against children plays a key role for the future of societies and healthy development of children.[6]

Poisoning is a preventable public health issue that accounts for a significant portion of emergency department admissions in childhood and may cause serious morbidity and mortality.[7] According to WHO, poisonings cause more than 45,000 deaths among children and young people under the age of 20 years every year.[8] According to the data of the US National Poison Data System, the majority (71.4%) of childhood poisonings occur in children under 5 years of age. In children aged 5 years and younger, the most common poisonings are reported to be household cleaning materials (10.3%) and analgesic drugs (9.54%).[9]

The aim of this study was to enhance the existing literature on effective interventions and measures to prevent these cases by discussing the clinical characteristics, the events causing the injury and the outcomes of child injury cases admitted to our outpatient forensic medicine clinic.

MATERIAL AND METHODS

Our study was conducted in accordance with the Declaration of Helsinki principles with the approval of xxx University Non-Interventional Clinical Research Ethics Committee dated May 31, 2023 and numbered E-60116787-020-374178.

All archive records prepared between 2013 and 2022 at XXX University Faculty of Medicine, Department of Forensic Medicine were retrospectively analysed. All reports on child trauma and poisoning cases were included in the study (n=1,244). Cases were categorised by trauma (blunt trauma, penetrating injury, physical (thermal and electrical) injuries, aspirations and explosion type injuries), injury site, forensic report outcomes (life-threatening, life-threatening cause, simple medical intervention, persistent mark on the face, bone fractures persistent weakening or loss of function of one of the senses or organs, speech and childbearing abilities).

Statistical evaluations were performed using SPSS version 21.0. Continuous variables are presented as mean±standard deviation, while categorical variables are presented as frequency and percentage. The Shapiro-Wilk test was utilized to assess the normality of the data distribution. The Mann-Whitney U and Kruskal-Wallis tests were applied for data that did not meet the assumptions of parametric tests. The chi square test was employed for categorical variables. A significance level of $p<0.05$ was deemed statistically significant within a 95% confidence interval.

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RESULTS

Of the 1,244 child trauma and poisoning cases included in the study, 31.3% (n=389) were female and 68.7% (n=855) were male. The mean age of males was 11.95 (±5.135), and the mean age of females was 10.75 (±5.354) (U=130307.0 p<0.001). It was found that 65.4% (n=814) of the cases were between the ages of 12-17.

When the cases were categorized by the type of trauma; 74% of the cases (n=937) were blunt traumas, followed by penetrating injuries with 13.3% (n=168). It was found that the majority of both penetrating and blunt injuries occurred in males (88.1% and 70.2%, respectively), while females were most frequently exposed to blunt trauma with 71% (n=279), followed by poisoning cases (Table 1).

The distribution of trauma types by age revealed significant differences (p<0.001). While penetrating injuries are commonly observed in older age groups, it is noteworthy that foreign body aspiration cases are seen in younger ages (Figure 1). The majority of penetrating injuries were due to stab wounds, followed by gunshot wounds at 14.3%.

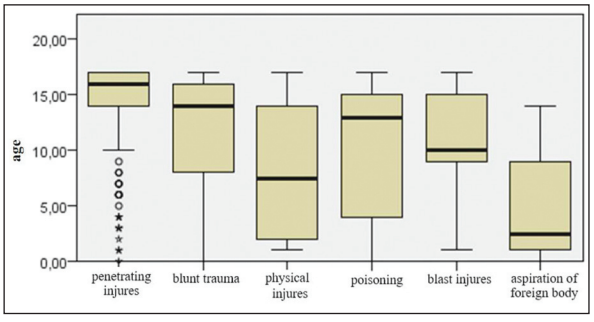

FIGURE 1: Box plot graph showing the distribution of trauma types according to age (Kruskal-Wallis test, p<0.001)

Blunt traumas were grouped as assault, in-vehicle traffic accidents and non-vehicle traffic accidents, falls and other accidents. Traffic accidents were the most prevalent (%60.8; n=570), followed by assault cases (%28.3; n=279). It was observed that 70.2% (n=658) of blunt trauma cases involved males, while 29.8% (n=279) involved females. It was found that 40.4% (n=266) of males were exposed to blunt trauma as a result of non-vehicle traffic accidents and 31.2% (n=205) as a result of assault (p<0.05). Additionally, 33.7% (n=94) of females were affected by blunt trauma from in-vehicle traffic accidents, and these rates were deemed statistically significant (p<0.05) (Table 2).

TABLE 1: Distribution of trauma and poisoning cases according to gender

		Female	Male	Total
Penetrating injury	n	20	148*	168
	%**	11.9	88.1	100.0
	%***	5.1	17.0	13.3
Blunt trauma	n	279	658	937
	%	29.8	70.2	100.0
	%	71.0	75.4	74.0
Physical injury	n	10	8	18
	%	55.6	44.4	100.0
	%	2.5	0.9	1.4
Poisoning	n	77*	51	128
	%	60.2	39.8	100.0
	%	19.6	5.8	10.1
Blast injuries	n	1	5	6
	%	16.7	83.3	100.0
	%	0.3	0.6	0.5
Aspiration of foreign body	n	6	3	9
	%	66.7	33.3	100.0
	%	1.5	0.3	0.7

*p<0.05; **Row percentages are given; ***Column percentages are given.

TABLE 2: Distribution of blunt traumas according to gender

		Female	Male	Total
Assault	n	60	205*	265
	%**	22.6	77.4	
	%***	21.5	31.2	
Traffic accidents	n	180	390	570
	%	31.6	68.4	
	%	64.5	59.3	
IVTA	n	94*	124	218
	%	43.1	56.9	
	%	33.7	18.8	
NVTA	n	86	266*	352
	%	24.4	75.6	
	%	30.8	40.4	
Fall	n	30	45	75
	%	40.0	60.0	
	%	10.8	6.8	
Other accidents****	n	9	18	27
	%	33.3	66.7	
	%	3.2	2.7	
Total	n	279	658	937
	%	29.8	70.2	100.0

*p<0.05; **Row percentages are given; ***Column percentages are given; ****Injuries that cannot be included in the existing classification; IVTA: In-vehicle traffic accidents; NVTA: Non-vehicle traffic accidents

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In the cases included in the study, 128 poisoning cases were identified. Of these, 60.2% (n=77) were females and 39.8% (n=51) were males ($p<0.05$). Drug intoxication was the most prevalent cause cause, accounting for 49.2% of poisoning cases and 71.4% of female cases were found to involve drug intoxication ($p<0.05$). When evaluating poisoning cases by age, it was observed that intoxication from drug, alcohol and narcotic stimulants occurred more frequently in older ages, while corrosive substance intake was seen in younger ages (Figure 2).

When blunt, penetrating, physical and blast type injuries (n=1,130) were categorised by the site of injury, it was found that head and neck injuries were the most common, accounting for 55.5% (n=628) of the cases. It was determined that penetrating injuries primarily involved lower and upper extremities as well as major vessel injuries, while blunt injuries were often located in the head and neck region (Table 3) ($p<0.05$).

The cases were categorized based to the report results into life-threatening danger, simple medical intervention, persistent mark on the face, persistent weakening or loss of function of one of the senses or organs, the ability to have children and persistent difficulty in speaking and were presented in a table (Table 4).

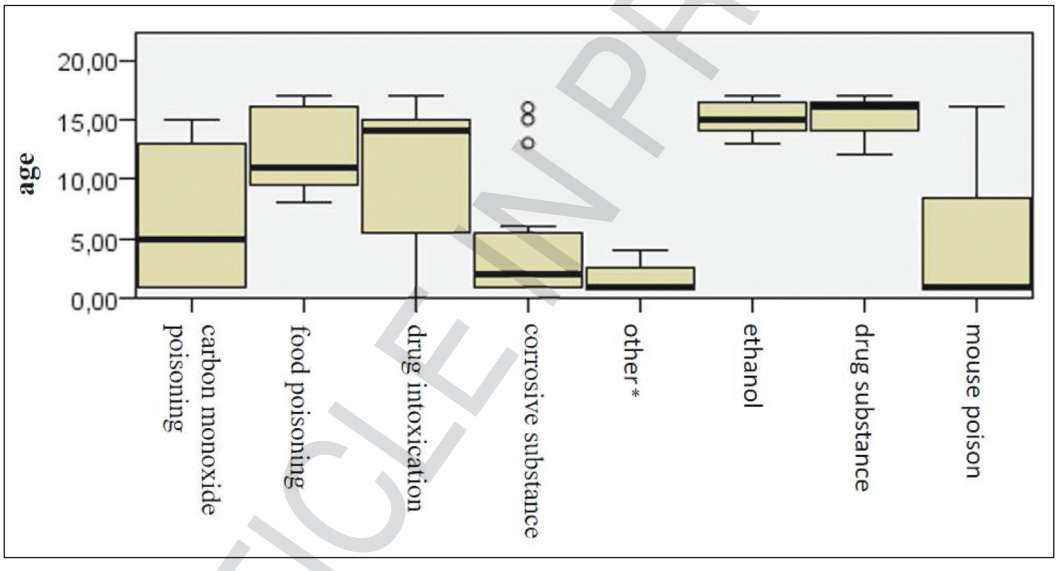

FIGURE 2: Distribution of substances causing poisoning according to age (Kruskall-Wallis test, $p<0.001$) *Organophosphate and sparklers

TABLE 3: Distribution of injury sites according to the type of injury

	Blunt traumas n (%**)	Penetrating injuries n (%)	Other injures*** n (%)	Total n (%)
Head-neck	591 (63.1)*	36 (21.6)	10 (43.5)	628 (55.5)
Thorax	116 (12.4)	24 (14.4)	3 (13)	138 (12.2)
Abdomen	61 (6.5)	13 (7.8)	1 (4.3)	74 (6.5)
Pelvis	48 (5.1)	6 (3.6)	-	54 (4.7)
Spine	20 (2.1)	1 (0.6)	-	21 (1.8)
Upper extremity	264 (28.2)	53 (31.7)*	12 (52.2)	322 (28.5)
Lower extremity	301 (32.1)	63 (37.7)*	6 (26.1)	359 (31.7)
Visceral organ	26 (2.8)	2 (1.2)	-	28 (2.4)
Major vessel	1 (0.1)	7 (4.2)*	-	8 (0.7)
Lumbar region	17	5	1	23 (2.0)
Injury not described	31	-	1	32 (2.8)

*p<0.05; **Column percentages are given; ***Physical and blast injuries

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TABLE 4: The results of the evaluation of the reports in terms of life-threatening danger, simple medical intervention, fixed mark on the face, bone fracture and persistent weakening or loss of function of one of the senses or organs

		No	**Yes**				**Total**
Life-threatening danger	n	998	181				1,179
	%	84.6	15.40				100
Simple medical intervention		Eliminable	No Eliminable				
	n	588	585				1,173
	%	50.1	49.9				100
Fixed mark on the face		Negative	Positive	AAT			
	n	101	21	135			257
	%	39.3	8.2	52.5			100
Bone fracture		No	Yes				
	n	899	345				1,244
	%	72.3	27.7				100
PWLF		Negative	Weakening	LoF	ID	AAT	
	n	98	5	8	2	94	207
	%	47.3	2.4	3.9	1	45.4	100

AAT: Apply after sufficient time has elapsed; PWLF: Persistent weakening or loss of function of one of the senses or organs; LoF: Lost of function; ID: Incurable disease

In 14.5% (n=181) of the injury cases, it was observed that the injury endangered the person's life. When the life-threatening causes of the cases were examined, it was found that 49.1% (n=84) of the cases had cranial injuries, 32.2% (n=55) of the cases had thoracic-lung injuries, 20.5% (n=35) of the cases had intra-abdominal injuries, and 9.9% (n=17) of the cases had major vascular injuries (some cases had multible life-threatening cause).

Life-threatening blunt injuries were most frequently life-threatening due to cranial injuries (60.3%), followed by thoracic and abdominal injuries (32.4% and 21.3%, respectively), and life-threatening penetrating injuries were frequently life-threatening due to major vessel and thoracic injuries (42.8% and 39.2%, respectively) (Tables 5).

Bone fractures and/or dislocations were identified in 27.7% (n=345) of the injury cases. It was observed that blunt injuries accounted for 93.3% (n=322) of these cases. It was observed that bone fractures were more common in non-vehicle traffic accidents ($p<0.05$), followed by assault and in-vehicle traffic accidents (Table 6).

TABLE 5: Distribution of life-threatening causes of life-threatening blunt and penetrating injuries

	Organs or tissues that cause life-threatening conditions					
	Cranial n (%*)	**Thorax-lung n (%)**	**Intra-abdominal n (%)**	**Major vessel n (%)**	**Other** n (%)**	**Total (%***)**
Assault	3 (50)	2 (33.3)	1 (16.7)	-	-	6 (4.4)
Trafic accident	66 (58.4)	39 (34.5)	27 (23.9)	5 (4.4)	4 (3.5)	113 (83.1)
IVTA	22 (56.4)	12 (30.8)	11 (28.2)	-	3 (7.7)	39 (28.7)
NVTA	44 (59.5)	27 (36.5)	16 (21.6)	5 (6.8)	1 (1.4)	74 (54.4)
Fall	12 (80)	2 (13.3)	1 (6.7)	-	-	15 (11)
Other accident	1 (50)	1 (50)	-	-	-	2 (1.5)
Total	82 (60.3)	44 (32.4)	29 (21.3)	5 (3.7)	4 (2.9)	136 (100)
Stab wound	-	7 (35)	5 (25)	9 (45)	-	20 (71.4)
Gunshot wound	1 (20)	4 (80)	1 (20)	-	-	5 (17.8)
Chop wound	-	-	-	2 (100)	-	2 (7.1)
Incision wound	-	-	-	1 (100)	-	1 (3.5)
Total	1 (3.5)	11 (39.2)	6 (21.4)	12 (42.8)	-	28 (100)

*Row percentages are given; **Cervical vertebrae and medulla spinalis injuries; ***Column percentages are given; IVTA: In-vehicle traffic accidents; NVTA: Non-vehicle traffic accidents

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TABLE 6: Distribution of blunt trauma patients with bone fracture/dislocation according to blunt trauma types

		Bone fracture/dislocation		
		No	Yes	Total
Assault	n (%**)	210 (79.2)*	55 (20.8)	265
IVTA	n (%)	162 (74.3)*	56 (25.7)	218
NVTA	n (%)	179 (50.9)	173 (49.1)*	352
Fall	n (%)	46 (61.3)	29 (38.7)	75
Other accidents	n (%)	18 (66.7)	9 (33.3)	27
Total	n (%)	615 (65.6)	322 (34.3)	937

*p<0.05; **Row percentages are given; IVTA: In-vehicle traffic accidents; NVTA: Non-vehicle traffic accidents

DISCUSSION

Childhood injury cases are reported to be more prevalent in males (61.9-67.9%).[10-12] In our study, we found that males accounted for 68.7% of the cases, which aligns with existing literature. It is believed that the higher exposure of male children to trauma is due to their tendency to engage in riskier behaviors during daily activities and social life.[13,14]

Blunt trauma is a common cause of childhood emergency room visits. Traffic accidents remain a significant cause of mortality and morbidity in childhood.[15] The male gender ratio in traffic accidents varies between 52.1% and 74.9%.[16] In our study, this ratio was found to be 68.4%. It is seen that males are more prone to traffic accidents and male gender is among the risk factors for traffic accidents.[17]

In our study, blunt injuries were most frequently observed in the head and neck region (63.1%), followed by the lower extremities (32.1%) and upper extremities (28.2%). In their study on traffic accidents in the pediatric population, Atik et al. reported that the head and neck region was the most commonly affected site (52.4%), followed by injuries to the lower extremities (36.3%) and upper extremities (17.4%).[18] Büken et al. found that among 436 pediatric cases with forensic reports from the pediatric emergency department, the lesions were most frequently located in the head and neck region (31.42%), followed by the upper extremities (27.06%) and lower extremities (19.27%).[19] In 2 studies localizing injuries with Abbreviated Injury Scale (AIS) scores of 3 and above in pediatric in-vehicle traffic accidents, it was reported that the most common injury localizations were the head region (27.3-40.5%), followed by the thorax (21.8%) and extremities (19.9-25.2%).[20,21] Our findings were consistent with those of Büken et al. and Atik et al. In the studies of Brown et al. and Takahashi et al., thorax traumas were significantly more prevalent than in our study.[18-21] This discrepancy may be attributed to the fact that only in-vehicle traffic accidents and AIS≥3 injury locations were included in their analysis. According to Şenavcı et al., AIS≥3 injuries and life-threatening injuries show 75.6% sensitivity and 99.1% specificity.[22] In our study, in 39 cases of in-vehicle traffic accidents with life-threatening injuries, cranial pathologies were the most common with 56.4%, while thoracic pathologies were the second most common with 30.8%.

Many studies indicate that non-vehicle traffic accidents cause more severe trauma than in-vehicle traffic accidents.[18,23,24] Lee et al. reported that the New Injury Severity Score (NISS) score is higher in non-vehicle traffic accidents.[24] In addition, high NISS scores have been found to be associated with longer hospital stays and increased mortality.[24] Atik et al. found that children involved sustained injuries in more areas compared to those in-vehicle accidents.[18] Töro et al. noted that head trauma is more prevalent in non-vehicle accidents.[23] In our study, it was observed that over half of the life-threatening cases (54.4%) among blunt traumas were due to non-vehicle traffic accidents, and 59.5% of these involving head and neck injuries. In addition, non-vehicle traffic accidents were found to cause bone fractures more frequently than in-vehicle traffic accidents, a difference that was statistically significant (p<0.05). Preventing serious traumas in traffic will be possible through the obligation and inspection of personal protective equipment for pedestrians, motorcyclists and cyclists, safe pedestrian crossings, bicycle paths and motorcycle lanes, and effective training of drivers.

Cases of assault in childhood are more prevalent, especially in adolescence over the age of 15 and among males. Kwan et al. report that 81.6% of assault cases over the age of 10 occur in people over the age of 15, 69% are male, and males are more likely to experience assault and penetrating injuries than females.[25] In our study, we found that 58.1% of

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the assault cases were 15 years of age and over and 77.4% were male. These findings suggest that male children may be more susceptible to physical violence, potentially due to their increased engagement in social activities and stronger ties to their social networks. Exposure to violence during childhood can result in various issues, including poor academic performance, mental health challenges, substance abuse, and criminal involvement. Prevention and intervention efforts for children and families are needed to reduce childhood violence before it leads to more serious problems.[26]

Penetrating injuries are included alongside blunt trauma in all pediatric trauma applications.[27] Studies report that penetrating injuries constitute 7.4-7.62% of pediatric trauma admissions.[28] In our study, penetrating injuries ranked second after blunt traumas with 13.3%. Studies report that the majority of penetrating injuries in the pediatric age group (41-63%) occur in children aged 16 years and older.[28,29] In our study, 55.9% of children with penetrating injuries were over 16 years of age, aligning with findings from other studies. Penetrating injuries were associated with upper and lower extremity and major vascular injuries ($p<0.05$). When the relationship between injury types and life-threatening conditions was examined, it was determined that 20% of penetrating injuries were life-threatening ($p=0.98$). However, 63.1% of penetrating injuries were found to be injuries that could not be treated with simple medical intervention ($p<0.05$). Based on these forensic report results, it can be concluded that penetrating injuries lead to more severe injuries from a legal standpoint.

Poisoning cases are often observed in the first and last 5 years of childhood. While accidental poisonings are prevalent in children under the age of 5, abusive drug poisonings are more common in those over 12. Males are more frequently affected between the ages of 0-12, whereas females show a higher prevalence after the age of 12. It has been reported that the most common substances that cause poisoning are pharmacological agents and corrosive substances.[9] In our study, male predominance (54.7%) was found in the 0-6 age group and female predominance (70.3%) in the 12-17 age group. The most common poisoning substance in the 0-6 age group was corrosive substances, whereas pharmacological agents were more prevalent in the 12-17 age group, with poisoning cases peaking in both the 0-6 and 12-17 age groups. Our findings align with the existing literature. Childhood poisoning cases can be prevented by preventing young children from accessing drugs and corrosive substances in the home environment, taking appropriate safety measures, and identifying children in the risk group during adolescence and conducting psychiatric interviews.

In studies conducted at forensic medicine clinics in Türkiye, injuries were evaluated as persistent mark on the face in 2.6-13.7% of trauma cases.[30,31] However, children and adults were included in these studies together. In studies that included only children, it was determined that cases that caused permanent marks on the face constituted 0.3-0.8% of all trauma cases, while this rate was 1.6% in our study.[10,14] This discrepancy between children and adults may be attributed to children's superior.[32]

In studies conducted in Türkiye, where both children and adults were evaluated, it was reported that 6.1-7.4% of the cases had injuries that caused the weakening or loss of one of their senses or organs.[30,33] In studies focusing solely on the pediatric age group, this rate was reported as 0.5-2.1%.[10,14] In our study, this rate was found to be 1% and is consistent with other studies examining children applying to forensic medicine outpatient clinics.

CONCLUSION

Consequently, it has been established that males are more frequently subjected to injury incidents. In penetrating trauma cases, the predominance of the male gender is particularly notable in blunt traumas, non-vehicle traffic accidents, and assault cases. In contrast, poisoning cases are more prevalent among females. Traffic accidents emerge as the leading cause of injury in children. Non-vehicle traffic accidents, which mostly cause life-threatening situations and bone fractures, lead to more severe traumas in children. Poisoning, which ranks third after blunt and penetrating injuries, is seen in the 0-6 age group due to corrosive substance intake and in the 12-17 age group due to drug intoxication.

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To prevent traffic accidents, which account for the majority of child traumas and can result in severe physical injuries, measures such as child-specific and high-security pedestrian crossings, safe social and playground areas to deter children from playing in traffic, and stricter traffic regulations around schools may help reduce childhood traffic accidents. Additionally, corrosive substances should be stored out of children's reach and in bottles with high-security caps to prevent poisoning incidents. Adequate psychiatric support should be offered to children in the high-risk group for poisoning cases among older children.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Abdülkadir İzci, Ayşe Kurtuluş Dereli, Kemalettin Acar;* ***Design:*** *Abdülkadir İzci, Ayşe Kurtuluş Dereli, Kemalettin Acar;* ***Control/Supervision:*** *Ayşe Kurtuluş Dereli, Kemalettin Acar;* ***Data Collection and/or Processing:*** *Abdülkadir İzci, Ayşe Kurtuluş Dereli;* ***Analysis and/or Interpretation:*** *Abdülkadir İzci, Ayşe Kurtuluş Dereli, Kemalettin Acar;* ***Literature Review:*** *Abdülkadir İzci;* ***Writing the Article:*** *Abdülkadir İzci, Ayşe Kurtuluş Dereli, Kemalettin Acar;* ***Critical Review:*** *Abdülkadir İzci, Ayşe Kurtuluş Dereli, Kemalettin Acar;* ***References and Fundings:*** *Ayşe Kurtuluş Dereli;* ***Materials:*** *Abdülkadir İzci, Ayşe Kurtuluş Dereli, Kemalettin Acar.*

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REFERENCES

1. Gicquel L, Ordonneau P, Blot E, Toillon C, Ingrand P, Romo L. Description of various factors contributing to traffic accidents in youth and measures proposed to alleviate recurrence. Front Psychiatry. 2017;8:94. PMID: 28620324; PMCID: PMC5451498.
2. World Health Organization [Internet]. Road traffic injuries: Children. © 2025 WHO [Cited: Jan 9, 2024]. Available from: https://www.who.int/news-room/questions-and-answers/item/road-traffic-injuries-children
3. UNICEF Vietnam [Internet] Children's way to school - the journey of worry. © 2025 WHO [Cited: 2024]. Available from: https://www.unicef.org/vietnam/stories/childrens-way-school-journey-worry
4. World Health Organization. Global Status Report on Preventing Violence Against Children 2020. 1st ed. Geneva: World Health Organization; 2020. https://iris.who.int/bitstream/handle/10665/332394/9789240004191-eng.pdf?sequence=1
5. Türkiye İstatistik Kurumu [İnternet]. Güvenlik Birimine Gelen veya Getirilen Çocuk İstatistikleri, 2023. [Erişim tarihi: 17 Şubat 2025]. Erişim linki: https://data.tuik.gov.tr/Bulten/Index?p=Guvenlik-Birimine-Gelen-veya-Getirilen-Cocuk-Istatistikleri-2023-53674
6. Tharp AT, Simon TR, Saul J. Preventing violence against children and youth. J Safety Res. 2012;43(4):291-8. PMID: 23127679.
7. Akgül F, Er A, Çelebi Çelik F, Çağlar A, Ulusoy E, Yılmaz D, et al. Retrospective analysis of childhood poisoning. Turk J Pediatr Emerg Intensive Care Med. 2016;91-6. https://doi.org/10.4274/cayd.02886
8. World Health Organization. Child injury prevention. 2010. Cited: Jan 8, 2024. Available from: https://apps.who.int/gb/ebwha/pdf_files/EB127/B127_5-en.pdf
9. Gummin DD, Mowry JB, Beuhler MC, Spyker DA, Bronstein AC, Rivers LJ, et al. 2020 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 38th Annual Report. Clin Toxicol (Phila). 2021;59(12):1282-501. PMID: 34890263.
10. Ersoy B, Balcı Y, Gök Y, Ünüvar Göçeoğlu Ü. Adli tıp polikliniğinde adli rapor düzenlenen çocuk hastaların değerlendirilmesi [The evaluation of pediatric patients with forensic reports in a forensic medicine out patient clinic]. Muğla Sıtkı Koçman Üniversitesi Tıp Dergisi. 2020;7(3):116-23. https://doi.org/10.47572/muskutd.644086
11. Özdemir AA, Elgörmüş Y, Çağ Y. Acil servise gelen adli nitelikli çocuk olgularin değerlendirilmesi [Evaluation of the pediatric forensic cases admitted to emergency department]. Uluslararası Temel ve Klinik Tıp Dergisi. 2016;4(1):1-8. https://namikkemalmedj.com/pdf/4615d177-864c-42ed-adf7-32226220a22b/articles/40449/nkmj-4-1-En.pdf
12. Demir ÖF, Aydın K, Turan F, Yurtseven A, Erbil B, Gülalp B. Analysis of pediatric forensic cases presented to emergency department. Turkish Archives of Pediatrics. 2013;48(3):235-40. https://doi.org/10.4274/tpa.266
13. Sever M, Saz EU, Koşargelir M. Bir üçüncü basamak hastane acil servisine başvuran adli nitelikli çocuk hastalarin değerlendirilmesi [An evaluation of the pediatric medico-legal admissions to a tertiary hospital emergency department]. Ulus Travma Acil Cerrahi Derg. 2010;16(3):260-7. Turkish. PMID: 20517754.
14. Baydemir Kılınç B. Atatürk Üniversitesi Tıp Fakültesi Adli Tıp Anabilim Dalında 2016-2018 Yılları Arasında Adli Değerlendirmesi Yapılan Çocuk Travma Olgularının Retrospektif İncelenmesi [Tıpta uzmanlık tezi]. Erzurum: Atatürk Üniversitesi; 2020. https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=_F5QEpayDXGqGZlp9XiFtP7KBx8BPojtOcItsieCNQUVRx989fi4DmImpB8EORkd
15. U.S. Department of Transportation [Internet]. Traffic Safety Facts 2021 Data. [Cited: Jan 11, 2024]. Available from: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813509.pdf
16. Dai W, Liu A, Kaminga AC, Deng J, Lai Z, Wen SW. Prevalence of posttraumatic stress disorder among children and adolescents following road traffic accidents: a meta-analysis. Can J Psychiatry. 2018;63(12):798-808. PMID: 30081648; PMCID: PMC6309043.

17. Wang Z, Chen H, Yu T, Liu S, Hu M. Status of injuries as a public health burden among children and adolescents in China: a systematic review and meta-analysis. Medicine (Baltimore). 2019;98(45):e17671. PMID: 31702619; PMCID: PMC6855559.

18. Dilek A, Cander B, Dikmetaş C, Bulut B, Eren S, Hilmi K, et al. Trafik kazası ile gelen pediatrik hastalarda, kaza oluş şekilleri ile travma skorlarının değerlendirilmesi [Evaluation of accident types and trauma scores in pediatric patients admitted with traffic accident]. Uludağ Üniversitesi Tıp Fakültesi Dergisi. 2020;46(1):47-52. https://doi.org/10.32708/uutfd.655843

19. Yaşar ZF, Büken E. Başkent Üniversitesi Hastanesine trafik kazası nedeniyle başvuran adli olguların incelenmesi [Examination of forensic cases that are consulted to the Başkent University Ankara Hospital because of traffic accident]. Adli Tıp Bülteni. 2015;20(3):132-7. https://doi.org/10.17986/blm.2015314257

20. Brown JK, Jing Y, Wang S, Ehrlich PF. Patterns of severe injury in pediatric car crash victims: Crash Injury Research Engineering Network database. J Pediatr Surg. 2006;41(2):362-7. PMID: 16481252.

21. Takahashi H, Fujita T, Nakahara S, Sakamoto T. Seating position and patterns of severely injured body parts among child passengers in motor vehicle crashes: Japan as a distinct case. Int J Inj Contr Saf Promot. 2018;25(4):427-32. PMID: 29671372.

22. Şenavcı M, Erel Ö. Travma skorlama sistemlerinin adli raporlarda yaşamı tehlikeye sokan yaralanmanın şiddetini ayırt etmede kullanılabilirliği [The usefulness of trauma scoring systems to differentiate severity of life-threatening injuries in forensic reports]. Adli Tıp Bülteni. 2022;27(1):17-23. https://doi.org/10.17986/blm.1544

23. Töro K, Hubay M, Sótonyi P, Keller E. Fatal traffic injuries among pedestrians, bicyclists and motor vehicle occupants. Forensic Sci Int. 2005;151(2-3):151-6. PMID: 15939146.

24. Lee JS, Kim YH, Yun JS, Jung SE, Chae CS, Chung MJ. Characteristics of patients injured in road traffic accidents according to the new injury severity score. Ann Rehabil Med. 2016;40(2):288-93. PMID: 27152279; PMCID: PMC4855123.

25. Kwan K, Wiebe D, Cerdá M, Goldman-Mellor S. Repeat assault ınjury among adolescents utilizing emergency care: a statewide longitudinal study. J Emerg Med. 2019;57(2):254-62. PMID: 31266688; PMCID: PMC6702071.

26. Benedini KM, Fagan AA, Gibson CL. The cycle of victimization: the relationship between childhood maltreatment and adolescent peer victimization. Child Abuse Negl. 2016;59:111-21. PMID: 27568065.

27. Stewart RM, Nathens AB. Michael C. Chang, MD, National Trauma Data Bank, Pediatric Report 2016. [Kaynağa erişim sağlanamamaktadır, kaynağa direkt ulaşılacak link eklenmelidir.]

28. Nielsen JW, Shi J, Wheeler K, Xiang H, Kenney BD. Resource use in pediatric blunt and penetrating trauma. J Surg Res. 2016;202(2):436-42. PMID: 27038660.

29. Apps JR, Williams C, McGuinness A, Gabbie S, Sutcliffe AG. Stabbing and safeguarding in children and young people: a Pan-London service evaluation and audit. JRSM Short Rep. 2013;4(7):1-7. https://doi.org/10.1177/2042533313485236

30. Kukul Güven FM, Bütün C, Yücel Beyaztaş F, Eren ŞH, Korkmaz İ. Cumhuriyet Üniversitesi Tıp Fakültesi Hastanesine başvuran adli olguların değerlendirilmesi [Evaluation of forensic cases admitted to Cumhuriyet University Hospital]. ADÜ Tıp Fakültesi Dergisi. 2009;10(3):23-8. https://dergipark.org.tr/en/download/article-file/679186

31. Akbaba M, Baransel Isır A, Karaaslan B, Dülger HE. Gaziantep Üniversitesi Adli Tıp Anabilim Dalı'nda düzenlenmiş adli raporların değerlendirilmesi (2005-2011) [Evaluation of the Forensic Reports Documented at the Department of Forensic Medicine of Gaziantep University (2005-2011)]. Bullettin of Legal Medicine. 2012;17(2):10-8. https://doi.org/10.17986/blm.201217226

32. Russell L. Understanding physiology of wound healing and how dressings help. Br J Nurs. 2000;9(1):10-2, 14, 16 passim. PMID: 10887841.

33. Tıraşçı Y, Durmaz U, Altınal A, Bulut K, Özdemir Y, Cengiz D, et al. Dicle Üniversitesi Adli Tıp Anabilim Dalınca 2012-2015 yılları arasında düzenlenen adli raporların retrospektif olarak değerlendirilmesi [A retrospective evaluation of judicial reports issued by forensic medicine department of]. Dicle Medical Journal. 2016;43(3):424-30. doi: 10.5798/diclemedj.0921.2016.03.0708

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