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Original article

Detection of the awareness rate of abuse in pediatric patients admitted to emergency medicine department with injury

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ABSTRACT

Objective: It was aimed to investigate whether neglected and abused pediatric patients are properly recognized and reported by emergency physicians in the emergency department (ED).

Methods: This prospective study was conducted on patients between 0 and 6 years of age presenting with trauma to ED. Patients were examined again by an emergency medicine specialist independent from the physician who did the first intervention during clinical follow-up phase after notification of patients presenting with trauma to emergency physician. Asked radiological examinations and clinical follow-up were performed. The suspected abuse evaluation form, consisting 12 items, which was formed by considering the forms used in previous studies was used to examine the awareness of physicians in cases of abuse suspicion.

Results: A total of 126 patients were included in our study. 54% of cases (n = 68) were male and mean age was determined to be 31.3 ± 18.9 months. It was found that no judicial records were written to 35.7% (n = 45) of our patients and that 11.1% (n = 5) of these patients were hospitalized. In 51.1% (n = 23) of patients without judicial records, multiple suspected abuse findings were identified. According to evaluation of first physician, it was found that 75.9% (n = 41) of discharged patients had no judicial records and was not considered as neglect and abuse.

Conclusion: We conclude that detection rates of abuse can be increased by developing child abuse screening forms and ensuring the continuity of the necessary training programs.

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1. Introduction

According to the first article of the Convention on the Rights of the Child, a person below the age of 18 is defined as a child.¹ Child abuse and neglect which is not known to what extent it is present

in the society is a serious health problem, because most of it remains hidden and their victims keep silent.²

Many abused children do not receive medical attention. Compared with the general children population, abused children are frequently brought to the emergency department before they are diagnosed as being abused.³ Prevention of recurrent or identified abuse at an early stage is necessary to limit the long-term effects of the abuse. Unfortunately, these children do not get diagnosed in the emergency department, despite their frequent use of emergency services.⁴ When abused children return to their homes without a good assessment, it was observed that 5–10% of patients were killed in the later stages and 35–50% were exposed to serious injuries.⁵ Physicians have a very important role in the

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identification and treatment of child abuse.⁶ Therefore, physicians should keep in mind child abuse as a differential diagnosis every time.

In this study, it was aimed to investigate whether neglected and abused pediatric patients are properly recognized and reported by emergency physicians in the emergency department.

2. Materials and methods

This prospective study was conducted on patients between 0 and 6 years of age presenting with trauma to Adana Numune Training and Research Hospital Emergency Department between 1 September 2011 and 1 September 2012 regardless of their judicial records status. Study was initiated after obtaining ethical approval. Consents were taken from the parents of all patients enrolled in the study. Patients over the age of 6 and who did not give informed consent were excluded. Patients with received consents were included in the study.

Patients were examined again by an emergency medicine specialist independent from the physician who did the first intervention during clinical follow-up phase after notification of patients presenting with trauma to emergency physician. Asked radiological examinations and clinical follow-up were performed.

Age, gender, type of admission to the emergency room, type of event, presenting complaints, type of injury, area of injury, traumatic lesions occurring after injury, transferred clinic (surgical/medical section), kinship of caregiver, number of individuals in the family, presence of any step parental, prior hospital admission due to same complaint of the patients were investigated by a form. The suspected abuse evaluation form, consisting 12 items, which was formed by considering the forms used in previous studies was used.⁷ With this form, awareness of physicians was examined in cases of abuse suspicion.

Mean, standard deviation, minimum–maximum, median, proportion and frequency values were used in descriptive statistics of the data. The distribution of variables was checked with Kolmogorov–Smirnov test. Mann–Whitney U and chi-square tests were used for the analysis of qualitative data. Categorical variables (such as age, gender) were summarized as mean and standard deviation and chi-square test statistic was used for comparison of categorical measurement. SPSS 21.0 software package was used for analysis.

3. Results

A total of 126 patients between 0 and 6 years of age who admitted with trauma were included in our study. Fifty-four percent of cases (n = 68) were male and mean age was determined to be 31.3 ± 18.9 (95% confidence interval) months.

Eighty-seven point three (n = 110) percent of cases were found to admit due to accidental injury. While falls from height was the most common reason with a rate of 36.5% (n = 46), it was followed by poisoning with 27.7% (n = 35), assault with 12.7% (n = 16), traffic accidents with 10.3% (n = 13), burns with 9.5% (n = 12) and stab injuries with 1.6% (n = 2). 20.6% of patients (n = 26) was found to be hospitalized to the surgical departments. One hundred and eight (85.7%) of these patients were found to be accompanied by mothers (Table 1).

Sixty-nine (n = 87) percent of cases suffered external injuries after trauma and older lesions were found in 1.6% (n = 2) of all patients. Extremity fractures were present in 3.9% (n = 5) of patients.

It was found that no judicial records were written to 35.7% (n = 45) of our patients and that 11.1% (n = 5) of these patients were hospitalized. In 51.1% (n = 23) of patients without judicial records,

Table 1
Characteristics of emergency trauma patients.

Age group (months)	
0–24	51 (40.6%)
25–48	57 (45.2%)
48–60	18 (14.2%)
Gender (male)	68 (54%)
Event type	
Accident	110 (87.3%)
Assault	16 (12.7%)
Event cause	
Fall from height	46 (36.5%)
Poisoning	25 (19.8%)
Stab wound	2 (1.6%)
Assault	16 (12.7%)
Traffic accident	13 (10.3%)
Burn	12 (9.5%)
Other	7 (5.6%)
Multi trauma	5 (3.9%)
Old lesion	2 (1.6%)
Extremity fracture	5 (3.9%)
Treatment outcome	
Discharged from the emergency department	83 (65.8%)
Hospitalization to the clinic	39 (30.9%)
Referral to another hospital	3 (2.3%)
Left voluntarily	1 (0.8%)
Hospitalization department	
Surgical service	26 (20.6%)
Pediatrics service	13 (10.3%)
Judicial record status of cases	
Judicial	81 (64.3%)
Not Judicial	45 (35.7%)
Past history of admission to emergency department with complaint of trauma	40 (31.7%)
Past history of admission to emergency department with complaint of other reasons	54 (42.8%)
Accompanying person during emergency department admission	
Mother	108 (85.7%)
Father	34 (26.9%)
Sibling	7 (5.5%)
Caregiver	3 (2.3%)
Other	20 (15.8%)
The presence of another injured in the incident	8 (6.3%)
The number of family members of patients	
Nuclear	21 (16.6%)
Large	105 (83.3%)
Findings of abuse	
None	43 (34.1%)
Single findings	23 (18.2%)
Multiple findings	60 (47.6%)

multiple suspected abuse findings were identified. Two of these cases were found to be beaten (Table 2).

Thirty-one point seven (n = 40) percent of patients were found to have already been admitted to the emergency room due to trauma and 30% (n = 12) of those were found to have multiple trauma.

When the children were evaluated in terms of abuse and neglect, positive findings were detected in 65.9% (n = 83) of cases. While 23 cases had only one positive finding, multiple positive findings were found in 60 cases. While “carelessness, indifference and neglect” was in the first place in 76 cases, it was followed by “frequent admission to emergency department in patient's previous records” in 34 cases and “the family's contradictory behavior and expression” in 29 cases (Table 3).

In this study, regarding type of events, 87.3% (n = 110) of cases were found to admit because of the accident. When the cases were examined in detail and suspected abuse evaluation form was considered, multiple suspected abuse was found in 47.6% (n = 60) of these cases.

According to evaluation of first physician, it was found that 75.9% (n = 41) of discharged patients had no judicial records and was not

Table 2
Characteristics of the cases that are not reported as judicial cases.

Non-judicial cases	45 (35.7%)
Treatment results	
Discharged from the emergency department	39 (30.9%)
Hospitalization to the clinic	5 (3.9%)
Left voluntarily	1 (0.8%)
Suspected abuse	
None	16 (12.6%)
Single findings	6 (4.7%)
Multiple findings	23 (18.2%)
Event cause	
Fall from height	31 (24.6%)
Poisoning	3 (2.3%)
Burn	8 (6.3%)
Stab wound	1 (0.8%)
Assault	2 (1.6%)
Multi trauma	1 (0.8%)
Extremity fracture	1 (0.8%)
Old lesion	1 (0.8%)
Frequent admission to the emergency department with trauma	10 (7.9%)

considered as neglect and abuse. Thirty-nine (30.9%) of the patients included in the study were hospitalized. Twelve (22.2%) of these hospitalized patients were found not to have judicial records. Significant difference was found between patients with and without judicial records ($p = 0.039$) (Tables 4 and 5). Six of those hospitalized patients underwent surgery and 3 patients were found not to have judicial records. All these patients were re-evaluated with suspected abuse evaluation form and judicial records were prepared.

4. Discussion

Child abuse and neglect, with medical, legal, developmental and psychosocial aspects, is a serious problem with quite complex causes and tragic consequences. Although abuse and neglect are frequent and major health problems, difficulties in diagnosis and cooperation with relevant expertise are being experienced due to lack of evidence, incorrect assessment and cultural and traditional values creating social pressure.

Many abused children do not receive medical attention. Children who are able to receive medical attention are severe and life-threatening cases and are usually taken to the emergency room. Establishing the diagnosis of child abuse and neglect cases from medical aspects may be possible with suspect and confirmatory diagnosis by results of detailed history, physical examination,

laboratory and imaging studies.⁸ Conflict between clinical findings during children's examination and stories told by family about mechanisms of these lesions, no provided detailed information by family, family recrimination of its members, contradictory or continuous changing stories and delayed hospital admission should remind possibility of abuse and neglect.⁸

In our country, there are no large studies partially or fully reflecting the dimensions of physical, emotional and sexual abuse of children in the family, in the institutions and in the society. In a study on a total of 16,100 children aged 4–12 years in eight provinces, the prevalence of physical abuse was 34.6% in girls and 32.5% in boys. In this study, in parallel with the data obtained in studies from our country,^{9–11} more abuse (54%, $n = 68$) were identified in male gender. The reasons for male gender being more involved in criminal cases and having more exposure to neglect and abuse can be classified as boys being more active, having more tough and physical strength requiring games, having more outdoor activities and less parental supervision.

One hundred and ten (87.3%) patients were reported as accidental injury, while 16 (12.7%) were beaten. Accidental injuries included traffic accidents, falls from height, burns, electrocution, drowning, firearms and stab injuries and poisonings. Ninety percent (90%) of traumas in childhood are blunt trauma and there are many studies reporting that close to 50% of those blunt traumas are also traffic accidents.^{12–18} Another reason for the high rate of traffic accidents incidence is that all vehicle accidents are reported as forensic case without exception besides being frequent, but vast majority of other falls or collision cases are not reported as forensic by emergency workers. In this case, the rate of traffic accidents is shown relatively higher. In case of skeptical approach to abuse and neglect and use of suspected abuse evaluation form by emergency physicians, we believe these statistics can be changed.

Accidents rank fourth as cause of death in children aged 1–4 years according to Turkey's State Institute of Statistics.¹⁹ One hundred and twenty thousand (120,000) children were admitted to the emergency department as a result of home accidents in the last five years and 2000 children died as a result of these accidents. This shows home accidents as a form of child neglect. Correct diagnosis of neglect and abuse in the emergency room as a result of home accidents will be able to carry a compelling in taking measures to prevent accidents in the home.

In our study, poisoning ranked second in accidental injury. Fifteen point nine percent (15.9%) of the cases admitted with only drug poisoning, whereas fall from height accompanied poisoning in 3 cases (2.4%). In this study, the most common poisoning agents were drugs. Around 80% of childhood poisoning cases were found

Table 3
Distribution of positive symptoms suggesting abuse.

Findings of abuse	n/(%)
No suspected abuse	43 (34.1%)
1: Physical or mental injury incompatible with history of the child	1 (0.8%)
2: Injury type being unusual for described accidental injuries	4 (3.2%)
3: Description is not consistent with the child's age or development	12 (9.5%)
4: Unreasonable or unexplained delays in child's medical treatment even though presence of a serious illness or injury	4 (3.2%)
5: Child being brought by anyone other than the parents for treatment. The place of the family cannot be explained by a suitable explanation, such as being out of town	10 (7.9%)
6: Inappropriate responses of family to the situation of children, such as overprotective, over-anxious, or totally unconcerned and indifferent responses to a serious injury	29 (23.0%)
7: Child has frequent history of emergency department admissions.	34 (27.0%)
8: Child has recurrent injuries or history of child abuse.	8 (6.3%)
9: Child has recurrent vaginal infections and/or genital injuries.	0 (0.0%)
10: Child's weight and length is below normal of age of the children (without medical explanation).	3 (2.4%)
11: Large families	22 (17.5%)
12: Carelessness, indifference, neglect	76 (60.3%)

‰: Percentage of Patients, n: Number of Patients with Positive Suspect.

Table 4
Comparison of data of judicial cases according to suspected abuse evaluation form part 1.

		Judicial event detection in hospital		p	Error type	
		True	False		Judicial-not abuse	Not judicial-abuse
		Avg. \pm SD/n-%	Avg. \pm SD/n-%		Avg. \pm SD/n-%	Avg. \pm SD/n-%
Age (months)		30.6 \pm 16.9	32.3 \pm 21.4	0.882	37.2 \pm 20.7	27.8 \pm 21.3
Gender	Female	30 \pm 41.7%	28 \pm 51.9%	0.256	13 \pm 50.0%	15 \pm 53.6%
	Male	42 \pm 58.3%	26 \pm 48.1%		13 \pm 50.0%	13 \pm 46.4%
Type of Event	Accident	61 \pm 84.7%	49 \pm 90.7%	0.315	23 \pm 88.5%	26 \pm 92.9%
	Assault	11 \pm 15.3%	5 \pm 9.3%		3 \pm 11.5%	2 \pm 7.1%
Occurred Injuries	Yes	50 \pm 69.4%	37 \pm 68.5%	0.911	15 \pm 57.7%	22 \pm 78.6%
	No	22 \pm 30.6%	17 \pm 31.5%		11 \pm 42.3%	6 \pm 21.4%
Old Lesions	Yes	1 \pm 1.4%	1 \pm 1.9%	0.837	0 \pm 0.0%	1 \pm 3.6%
	No	71 \pm 98.6%	53 \pm 98.1%		26 \pm 100.0%	27 \pm 96.4%
Extremity Fracture	Yes	4 \pm 5.6%	1 \pm 1.9%	0.292	0 \pm 0.0%	1 \pm 3.6%
	No	68 \pm 94.4%	53 \pm 98.1%		26 \pm 100.0%	27 \pm 96.4%

Chi-square test/Mann–Whitney U test.

Table 5
Comparison of data of judicial cases according to suspected abuse evaluation form part 2.

		Judicial event detection in hospital		p	Error type	
		True	False		Judicial-not abuse	Not judicial-abuse
		Avg. \pm SD/n-%	Avg. \pm SD/n-%		Avg. \pm SD/n-%	Avg. \pm SD/n-%
Outcome	Discharged	42 \pm 58.3%	41 \pm 75.9%	0.039	18 \pm 69.2%	23 \pm 82.1%
	Hospitalized	27 \pm 37.5%	12 \pm 22.2%		8 \pm 30.8%	4 \pm 14.3%
	Referral	3 \pm 4.2%	0 \pm 0.0%		0 \pm 0.0%	0 \pm 0.0%
	Leave voluntarily	0 \pm 0.0%	1 \pm 1.9%		0 \pm 0.0%	1 \pm 3.6%
Service	No hospitalization	45 \pm 62.5%	42 \pm 77.8%	0.066	18 \pm 69.2%	24 \pm 85.7%
	Neurosurgery	5 \pm 6.9%	3 \pm 5.6%		2 \pm 7.7%	1 \pm 3.6%
	Pediatric surgery	8 \pm 11.1%	1 \pm 1.9%		0 \pm 0.0%	1 \pm 3.6%
	Orthopedics	1 \pm 1.4%	1 \pm 1.9%		1 \pm 3.8%	0 \pm 0.0%
	Burn unit	2 \pm 2.8%	1 \pm 1.9%		0 \pm 0.0%	1 \pm 3.6%
	Children's service	9 \pm 12.5%	4 \pm 7.4%		4 \pm 15.4%	0 \pm 0.0%
	Other	2 \pm 2.8%	2 \pm 3.7%		1 \pm 3.8%	1 \pm 3.6%
Days of admission		3.0 \pm 3.5	2.6 \pm 4.9	0.151	3.1 \pm 6.0	1.5 \pm 0.6
Surgical Treatment	Yes	3 \pm 4.2%	3 \pm 5.6%	0.235	2 \pm 7.7%	1 \pm 3.6%
	No	23 \pm 31.9%	8 \pm 14.8%		5 \pm 19.2%	3 \pm 10.7%

Chi-square test/Mann–Whitney U test.

in children less than six years of age.²⁰ In this age group, together with increase in motor skills and interest in research and learning, poisoning is common. This exposure increases with careless and unconscious family members putting drug preparations and other toxic products to easily accessible places, keeping drugs out of their own boxes, keeping cleaning agents in easily accessible places and beverage storages and children's poor control.²¹ As a result of emergency department physicians recognizing poisoned patients correctly, both judicial reporting will be provided and effect of the accident on child and family will reduce with psychosocial support.

The ratio of detected assault was 12.7% (n = 16). Assault-induced forensic cases are reported among the first four causes in neglect and abuse series and the incidence is reported to be between 6% and 19% in various studies.^{22–27} These cases were suspected due to the presence of traces of old bruises and burns, contradictory statements of family, fussy family members, accompanying old lesions to new, children being taken to emergency department by different family members and prior admission due to multiple trauma and physical abuse was demonstrated in these patients. Physical assault cases should be evaluated in detail, and the importance of the use of a suspected abuse evaluation form should not be forgotten besides careful history and physical examination.

In our study, 12 (9.5%) burns were observed in patients. The past medical records of these cases were evaluated in the light of

findings detected during physical examination and evidences showing physical abuse were revealed. A burn case had been brought to the emergency room several times due to burns and another case was found to have admissions due to beating, poisoning, falls and drug poisoning. When assessing burn patients, an emergency physician should carefully detect the presence of old lesions as well as newly developed lesions, check old records, carefully watch attitudes and behaviors of family members and make judicial declaration in the presence of suspected abuse and neglect.

Child abuse and neglect often cannot be identified in the emergency departments. Because injuries are recorded as normal accidents.²⁷

The deterioration of individual's physical or mental health due to intentional, imprudent, reckless or negligent behavior includes legal aspects and is considered criminal cases.²⁸ Although child abuse affects children of all ages, the risk of exposure to serious injury requiring medical intervention of a smaller child is high because of being much more vulnerable. Thus emergency service personnel should suspect child abuse more frequently in this age group and initiate necessary legal procedures.²⁹ In studies analyzing the pediatric trauma patients admitted to the emergency department, patients appear to be discharged from the emergency service after evaluation with an average rate of 65.97%, 50.13% and 65.33%.^{9,30} Considering the fact that traumatic lesions were seen in

87% of abuse and neglect cases in this study, discharge rate is similar to the literature. Not suspecting from abuse and neglect and lack of judicial notice for the determination of causing events will lead to a lack of taking the necessary measures to prevent these reasons and these patients will not be prevented from admitting to emergency room with repeated abuse and neglect.

Of 12 hospitalized patients who lack judicial notice after the first assessment, 6 patients required surgical intervention. When patients with and without judicial notices were compared, a statistically significant difference was found ($p = 0.039$). Judicial notices of patients who were not having judicial statements were evaluated again with abuse evaluation form and their reports were provided. Physicians working in the emergency department not using abuse evaluation forms cause misinterpretations and prepare the ground for medico-legal issues. We believe that both legal issues and morbidity and mortality can be prevented by using suspected abuse evaluation form.

In this study, we have found that using child abuse screening form helps in the diagnosis of child abuse and neglect in cases when no diagnosis could be made in the emergency department. Insufficient judicial records and high suspicion of abuse in these cases show that physicians do not have sufficient knowledge and skills in this regard. We conclude that detection rates of abuse will increase by developing child abuse screening forms and ensuring the continuity of the necessary training programs before and after graduation. Child's medical history, reactions of family during examination and child's psychological state should be evaluated as a whole and multidisciplinary approaches should be asked in necessary cases with emergency medicine, social pediatrics, forensic medicine and child psychiatry consultations, so this will reduce abuse and neglect rates in children.

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