









Original Article

The changing face of abuse cases in a pediatric intensive care unit: A single-center experience

Fatih Varol,¹  Ebru Sahin,¹  Busra Ozgunay,²  Mehmet Cengiz,²  Zeynep Meva Altas³  and Sirin Guven² ¹Department of Pediatric Intensive Care, ²Department of Pediatrics, Sancaktepe Sehit Prof. Dr. Ilhan Varank Training and Research Hospital, Health Science University, and ³Department of Public Health, Marmara University Faculty of Medicine, Istanbul, Turkey

Abstract **Background:** Due to the increase in abuse and neglect cases in recent years, the purpose of this study was to assess child abuse and neglect of patients who were hospitalized and followed up in our pediatric intensive care unit (PICU).

Methods: A total of 34 abuse and neglect patients who were admitted to the PICU from August 2020 to March 2021 were included retrospectively in the study. Patients' clinical and demographic characteristics were obtained from our hospital's patient record system (HIS). Comorbidities and the mental status of the patients, affected systems, treatments, and outcomes were extracted.

Results: In this study, 44.1% (*n*: 15) of the patients were male and 55.9% (*n*: 19) were female. Physical neglect such as foreign body aspiration, malnutrition, electrocution, drowning, traffic accident, and body collision was detected in 14 (41.2%) patients. Emotional neglect (taking drugs, alcohol, or suicide) was found in 19 (55.9%) of our patients. Only 1 (2.9%) patient presented with physical abuse.

Conclusions: Perception of neglect varies among different cultures. Any infant or child who is admitted to the PICU with a history that is not consistent, a history of delay in seeking medical attention, a previous history of abuse or suspected abuse, or the absence of the primary caretaker at the appearance of illness should signal possible abuse. Health-care professionals should give more attention to these patients to prevent the overlooking and recurrence of neglect and abuse cases due to the intense work tempo in the PICU.

Key words child abuse, emotional neglect, pediatric intensive care unit, physical neglect.

Child abuse, defined as all kinds of behavior negatively affecting the growth and development of a child, has been encountered in every culture throughout the history of humanity.¹ It is difficult to find a universal definition of child abuse and neglect due to differences that modify the perception of behavior that result in neglect and abuse, such as acculturation, methods used to discipline children, knowledge of child development, and family relationships.² The World Health Organization (WHO) defines abuse and neglect as all kinds of disease treatment of a child by an adult that results in actual or potential damage to the child's health, survival, development, and dignity.³ Abuse is examined in three groups: physical, emotional, and sexual. The WHO declares that physical abuse and neglect are the most frequent causes of maltreatment and death of children.⁴

Physical abuse includes non-accidental child injury and injuries caused by maltreatment. In short, physical abuse can be defined as non-accidental injury.^{5–7} Psychological damaging of children and adolescents by social and scientific standards with them being exposed to attitudes and behavior that affect them negatively, or depriving them of necessary attention, affection, and care is emotional abuse.¹ Sexual abuse is the act of using a child that is not completely developed psychosocially, for sexual gratification by an adult. Seventy-one percent of children and adolescents that are sexually abused are female and 29% are male.⁵ Various studies show that 20–25% of sexual abuse cases are incest cases.⁸ On the other hand, neglect is the deprivation of a child from vital requirements such as nutrition, overall health, shelter, clothing, protection, and supervision by the adults responsible.¹ Burning, scalding, falling from heights, drugs, and intake of poisonous substance may suggest that the child is neglected. Every bone fracture, injury, and burn, under the age of 1 should be considered in terms of abuse and neglect.

Child neglect has a negative impact on a child's development due to the lack of treatment and behavior that are necessary for healthy development and caregivers' insufficiency in

Correspondence: Fatih Varol, MD, Department of Pediatric Intensive Care, Sancaktepe Sehit Prof. Dr. Ilhan Varank Training and Research Hospital, Health Science University, Istanbul, Turkey. Email: dr_fvarol@yahoo.com

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meeting the child's needs. It is more frequent than any kind of abuse. Neglect is twice as common as physical abuse and five times more frequent than sexual abuse, but studies on neglect are scarce compared to studies on abuse, hence the actual frequency is more difficult to determine.^{9,10} Physical, medical, and emotional neglect are different types of child neglect.

Signs of abuse and neglect may be incidentally observed in a patient who is being followed up in the pediatric intensive care unit (PICU) and to ensure the patient's safety, it is the duty of nurses as well as doctors who follow up on the patient to take a thorough medical history and to record the findings accurately.¹¹ In a PICU, abuse cases most often present with serious head trauma as well as with symptoms in a broader perspective such as respiratory and cardiac arrest, apnea, seizures, asphyxiation, chest and abdomen trauma, fractures, and unexplained metabolic acidosis.¹² The leading cause of death in specifically abused children under the age of 2 is head trauma.^{13,14} It has been demonstrated that most of the children who suffered from multiple head traumas presented with evidence of other hidden injuries including fractures during medical examination.^{13,15} The American Academy of Pediatrics recommends that, for all children under the age of 2 with suspicious injuries, skeletal imaging should be performed to reveal hidden skeletal system injuries.¹⁶

In this study, we aimed to evaluate the patient characteristics, demographic/clinical findings, and outcomes of child abuse and neglect cases who were followed up in our PICU for a 1 year period.

Methods

Study design

This is a descriptive and retrospective study. We evaluated abuse and neglect cases that were followed up from August 2020 to March 2021 in our PICU. The data regarding patient age, sex, the season of admission, type of abuse and neglect, family characteristics, etiology of trauma, affected systems, underlying diseases, radiological findings, duration of hospitalization, duration of mechanical ventilation, and mortality were obtained from the statistical archive software in the hospital's patient record system (HIS). Ethics committee authorization and institution authorization were acquired from Istanbul Sancaktepe Sehit Prof. Dr. Ilhan Varank Training and Research Hospital (00137288580/2021/128). Detailed informed consent was obtained from our patients' parents.

All cases were categorized into four age groups: infants (<1 year), preschool (1 to <6 years), school-age (6 to <12 years), and adolescents (12 to <18 years). Neglect cases were classified as physical abuse, physical neglect, and emotional neglect. Each case diagnosed as neglect or abuse was evaluated and diagnosed by the child psychiatrist after repeated examinations. When cases of physical neglect were questioned, it was seen that especially young patients were left alone at home by their parents or allowed to play alone on the

street without a parent. On the other hand, the patients in the emotional neglect group had a history of being ignored, excluded, and not cared about by their friends and families. Patients that took drugs accidentally were excluded from the study, as there was no history of recurrent drug intake, and no findings suggestive of neglect were found in the psychosocial evaluation.

Statistical analysis

The data collected were analyzed using SPSS Data Analysis, version 21.0 (SPSS Inc., Chicago, IL, USA). This included frequency (counts) and percentages for nominal variables, medians and minimum, maximum values for continuous variables. Kolmogorov–Smirnov tests were used to assess the normality of the distribution of continuous variables. The alpha error was set at 0.05.

Results

Our study investigated 19 (55.9%) female and 15 (44.1%) male patients. The median age of the patients was 13.1 years (minimum 0.4, maximum 17.9). Three patients under the age of 1 (8.8%), 9 patients between the ages of 1–6 (26.5%), 4 patients between the ages of 6–12 (11.8%), and 18 patients between the ages of 12–18 (52.9%) are present, with respect to age groups. The median mother's age is 40.0 (minimum 24, maximum 50). The family income level of 29 patients (85.3%) is 5,000 Turkish lira or less. One patient (2.9%) had separated parents, and the remainder of the patients' parents were together (Table 1).

Patients were divided into three main groups: physical abuse, physical neglect, and emotional neglect. There was 1 patient (2.9%) who had been physically abused; there were 14 patients (41.2%) who had been subjected to physical neglect (foreign body aspiration, malnutrition, electrocution, drowning in water, traffic accident, impact injury); and 19 patients (55.9%) had been emotionally neglected (drug and alcohol use, suicide attempt). Twelve of them (35.3%) were admitted in winter, 5 (14.7%) in spring, 5 (14.7%) in summer, and 12 (35.3%) in autumn.

The complete blood count (CBC), electrolyte, renal/liver function tests, and coagulation parameters of the patients were observed to be within the normal ranges. Lactate levels were observed to be a minimum of 0.4 and a maximum of 15 in trauma patients. The shortest hospitalization period was 1 day, and the longest was 26 days. Overall 7 (20.6%) of the neglected/abused patients were intubated. It was observed that 7 patients who were intubated were followed up on mechanical ventilator for the minimum 1 day and the maximum 13 days. The central nervous system was the most affected system in 16 patients (47.1%), followed by the respiratory system in 3 patients (8.8%), and multiple system including the nervous system in 6 patients (17.6%). Of 34 patients, 2 (5.9%) had a diagnosis of autism, while 4 patients (11.8%) were diagnosed with mental retardation.

Table 1 Characteristics of the cases (n=34)

	Median (min.–max.)
Age (year)	13.1 (0.4–17.9)
Duration of hospital stay (day)	4.5 (1–26)
	<i>n</i> (%)
Gender	
Female	19 (55.9)
Male	15 (44.1)
Age group (years)	
<1	3 (8.8)
1–5	9 (26.5)
6–11	4 (11.8)
12–18	18 (52.9)
Diagnostic details	
Physical abuse	1 (2.9)
Physical neglect: Foreign body aspiration, malnutrition, electrocution, drowning, traffic accident, body collision	14 (41.2)
Emotional neglect: Taking drugs, alcohol, suicide	19 (55.9)
Season	
Winter	12 (35.3)
Spring	5 (14.7)
Summer	5 (14.7)
Autumn	12 (35.3)
Parents	
Together	33 (97.1)
Separated	1 (2.9)
Intubation	
Yes	7 (20.6)
No	27 (79.4)
Affected system	
Nervous system	16 (47.1)
Respiratory system	3 (8.8)
Two or more systems	6 (17.6)
None	9 (26.5)
Existing condition	
Autism	2 (5.9)
Mental retardation	4 (11.8)
None	28 (82.4)
Mortality	
Alive	33 (97.1)
Dead	1 (2.9)

As can be seen in Table 2, cranial computed tomography (CT) was performed on 13 out of 34 patients. They were specifically followed up due to physical neglect and hemorrhage was reported in 7 patients, brain edema in 2, contusion in 1, and 3 patients were reported as normal. Cranial magnetic resonance imaging (MRI) was performed on 6 patients with symptoms of encephalopathy and seizures, and bleeding and contusion were observed in 1 patient. While 4 of the 7 patients, who received abdominal CT were reported as normal, 1 had a liver laceration and 2 had a spleen laceration. Four abdominal ultrasound (US) tests were performed on the patients who were followed up for traffic accidents and falls,

Table 2 Imaging tests of the children diagnosed with abuse or neglect (n=30)

	<i>n</i> (%)
Cranial computed tomography	13 (38.2)
Normal	3 (8.8)
Hemorrhage	7 (20.6)
Brain edema	2 (5.9)
Contusion	1 (2.9)
Cranial magnetic resonance imaging	6 (17.6)
Normal	5 (14.7)
Contusion, hemorrhage	1 (2.9)
Abdominal computed tomography	7 (20.6)
Normal	4 (11.8)
Liver laceration	1 (2.9)
Spleen laceration	2 (5.9)
Abdominal ultrasound	4 (11.8)
Normal	2 (5.9)
Spleen laceration	2 (5.9)

2 spleen lacerations were observed, and another 2 were reported as normal (Table 3).

Discussion

Child abuse is a major global problem with child mortality rates over 50 000 per year.¹⁷ In the USA, more than 1,500 deaths are reported annually, with over 80% of the victims found to be under 4 years of age.¹⁸ It has been noted that small children are more at risk when compared to older children due to their inability to defend themselves.^{18,19} It has been established that 25% of the children aged 7–18 in our country have been subjected to neglect, 43% to physical abuse, 3% to sexual abuse, and 51% to emotional abuse.^{9,20} Previously, it has been shown that the ratio of patients who were being followed up in a PICU due to maltreatment was 9.8%, which was higher than the 2–6% announced by the Intensive Care Society.⁴ Studies performed in Turkey at different time periods with different age groups, state that the frequency of physical abuse is between 30–54%.⁵ On the other hand, worldwide, nearly a quarter of adults (22.6%) suffered from physical abuse, 36.3% from emotional abuse, and 16.3% regardless of gender suffered from neglect during childhood.³ In this study there were 14 patients (41.2%) who had been subjected to physical neglect; there were 19 patients (55.9%) who were emotionally neglected, and there was 1 patient (2.9%) who had been physically abused.

Previously it had been reported that while physical or sexual abuse cases were more common in male patients, females were the dominant target in neglect, which is the most common type of abuse.^{9,21} Although some studies noted that female cases were more common,²² the general opinion in the literature is that neglect and abuse were more common in male patients.^{23,24} Contrary to the general opinion in the literature, females composed the majority of neglect and abuse cases in this study. We attributed this result to the fact that the majority of our patients were emotional neglect cases.

Table 3 Patient characteristics of abuse and neglect cases who were tested with cranial computed tomography imaging

Patient	Age (years)	Gender	CT findings	MR findings	Duration of stay (days)	Duration of MV	State of MV	Mortality
1	7 y 4 m	Female	Hemorrhage	Not tested	12	0	None	Survivor
2	5 m	Female	Hemorrhage	Not tested	2	0	None	Survivor
3	13 y 5 m	Male	Hemorrhage	Not tested	7	3	Intubated	Survivor
4	17 y 5 m	Male	Hemorrhage	Contusion/Hemorrhage	7	4	Intubated	Survivor
5	1 y 2 m	Female	Hemorrhage	Not tested	1	0	Intubated	Non survivor
6	17 y 6 m	Male	Hemorrhage	Not tested	12	2	Intubated	Survivor
7	5 y 1 m	Male	Hemorrhage	Not tested	5	0	None	Survivor
8	1 y 4 m	Female	Cerebral Edema	Normal	26	13	Intubated	Survivor
9	10 y 6 m	Male	Cerebral edema	Not tested	20	0	None	Survivor
10	14 y 7 m	Male	Contusion	Not tested	10	5	Intubated	Survivor

CT, Computed Tomography; MR, Magnetic Resonance; MV, Mechanical Ventilation.

In the literature, it was evaluated that the cases of neglect and abuse were most frequent between the ages of 0–5. Previous studies reported that the rate of neglect and abuse increased as the age decreased.^{23–25} In a study regarding the data of abuse and neglect cases who were admitted to the intensive care units, it was reported that patients who suffered physical abuse were found to be in a younger age group than those who were neglected.⁴ In this study, the median age of patients was 13.1 years (minimum 0.4; maximum 17.9). In our opinion, this is due to the higher number of neglect cases among the 34 patients. There was only one case of physical abuse and she was under the age of 1. She had a history of repeated hospitalization due to physical abuse several times and died in the PICU, which was her last hospitalization due to physical abuse.

The majority of the cases considered as physical negligence were drowning in water, poisoning, and traumas as a result of preventable home accidents.^{18,26} Consistent with the literature, this study consists of 14 patients who were followed up for physical neglect due to foreign body aspiration, malnutrition, electrocution, drowning in water, traffic accidents, impact injury, and falling from heights.

Unexplained acute changes of consciousness should also be associated with possible head trauma. In a study by Lee *et al.*, it was mentioned that the central nervous system was the most affected system in neglect-abuse cases between 0 and 18 years of age, which were followed up in an intensive care unit.⁴ Similarly, in this study, it was shown that the central nervous system was the most affected system in patients with neglect and abuse, followed by the respiratory system, skeletal system, and gastrointestinal and genitourinary systems, together with the central nervous system. We have determined that functional restriction in our patients was caused by multiple fractures and brain damage.

Emotional abuse and neglect of a child are defined as any act or inaction that harms the emotional integrity and development of the child. Although emotional abuse is very rare, emotional neglect is the most common type of maltreatment. There was no significant difference between males and females in the rate of occurrence of emotional abuse. It peaked between 6–8 years of age and stayed almost

unchanged throughout adolescence. In neglect cases, too, there were no significant differences in the occurrence rate between the genders and it is most commonly encountered in the first few years after birth.^{18,27} About 90% of cases of physical abuse and neglect reportedly involve emotional neglect and abuse.^{18,28} In our study, alcohol use and drug use for a suicide attempt formed our emotional neglect group and 19 patients were analyzed. The majority of the patients were in the adolescent age group and they used their own or household drugs for suicide attempts more often. Younger patients who had frequent accidental drug admissions were not included in this study.

Economic, social, environmental, and cultural circumstances may cause a family crisis that might lead to child abuse. Economic insufficiency is the most important stress factor within the family.^{29,30} In accordance with the literature, the family income level of 29 patients (85.3%) is 5,000 Turkish lira or less in this study. Cases of child abuse and neglect continue to increase and are a national epidemic. Economic stress, caregiver mental health concerns, and natural disasters are all associated with an increased risk of child abuse, raising concern that the severe acute respiratory syndrome coronavirus pandemic may have placed children at high risk of abuse.³¹ Similar to the other literature examined, this study reveals that autumn has the highest incidence in the seasonal distribution of abuse and neglect cases.⁴ However, unlike the other studies in the literature, this study has shown that the incidence was high during winter as well. We believe that this is mainly due to the increase in the time spent at home due to the pandemic.

Unfortunately, the ratio of neglected and abused children in our country is still not clearly known. Endeavors to create a safe environment for children should include protective and interventionist education policies. Appropriate legal arrangements should also be made to reduce the frequency of criminal incidents.³²

Conclusion

In our opinion, the most remarkable point in this study is that the number of neglect and abuse cases who were followed up

in the pediatric intensive care unit for less than 1 year is high. Awareness and knowledge about abuse and neglect affecting the physical, psychological and emotional development of children are crucial and most of the responsibility falls to the health-care professionals. Any infant or child admitted to the PICU with a history that is not consistent, a history of delay in seeking medical attention, a previous history of abuse or suspected abuse, or the absence of the primary caretaker at the appearance of illness should signal possible abuse. Health professionals should therefore give more attention to these patients to prevent the overlooking and recurrence of the neglect and abuse cases during the intense work tempo in PICU.

Limitations

Due to the time limitation, the low number of cases is our limitation in this article. Patients within the last 7 months between August 2020–March 2021 were included in the study because our pediatric intensive care unit was opened in August 2020.

Disclosure

The authors declare no conflict of interest.

Author contributions

F.V. and E.S. had a role in the patients' diagnosis, M.C., and Z.M.A. played a role in study documentation and table preparation. B.O. and S.G. had a role in the literature overview. All authors read and approved the final manuscript.

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