

## ORIGINAL ARTICLE

## Posttraumatic stress disorder in a pediatric population treated at the Children's Hospital of the State of Chihuahua, Mexico

Luis Carlos Hinojos-Gallardo,<sup>1</sup> Leyla Ruíz-Escalona,<sup>2</sup> Martín Cisneros-Castolo,<sup>3</sup> Elizabeth Mireles-Vega,<sup>1</sup> Gustavo Alfonso Pando-Tarín,<sup>1</sup> and Joel Mario Bejarano-Marín<sup>1</sup>

### ABSTRACT

**Background.** Due to the increase in various types of violent actions in our community, there is a preoccupation regarding the psychological consequences for children who survive a traumatic event. The aim of this study was to identify factors related to the development of posttraumatic stress disorder (PTSD) in pediatric patients treated in the Department of Child Psychology at Children's Hospital of the State of Chihuahua (HIECH).

**Methods.** We conducted a retrospective cross-sectional study examining the clinical files during a 3-month period of patients treated in the Department of Child Psychology of HIECH. The study was conducted with frequencies and bivariate analysis.

**Results.** We analyzed a total of 125 clinical files of which 41.6% corresponded to males and 58.4% to females. In 52 patients the triggering event was a violent action, whereas in 73 patients the event was accidental. The age of the patients was between 5 and 15 years and the highest prevalence was found in patients between 5 and 7 years of age. No statistically significant association was found in regard to parental education, religion, or family type (intact or dysfunctional) with the development of PTSD.

**Conclusions.** Posttraumatic stress disorder in the pediatric population has increased considerably in recent years. Proper identification of patients with data suggestive of the diagnosis is important in order to implement therapies that avoid psychological consequences.

**Keywords:** posttraumatic stress disorder, pediatric population.

### INTRODUCTION

Posttraumatic stress disorder (PTSD) is officially recognized by the Diagnostic and Statistical Manual of Mental Disorders (DSM)-III of the American Psychiatric Association in 1980 primarily as a way of classifying psychological disorders of war veterans. It was not until 1987 that it was officially recognized that children suffered psychological reactions after a traumatic event. Currently, PTSD is a well-identified entity in childhood and we iden-

tify three basic criteria for its diagnosis: re-experiencing or recurrence of the event, actions to avoid activities, places, words, etc. related to trauma and symptoms of hyperexcitement. Given the increase of violent actions of various types in our community, there is concern about the psychological consequences in children surviving a traumatic event and the importance of promoting further psychological assessment of affected children in the pediatric emergency room.

PTSD develops after a traumatic event or exceptionally threatening or catastrophic natural situation. PTSD does not develop, therefore, after unpleasant situations described as "traumatic" in everyday language such as a divorce, job loss or failure of a test. PTSD is a disorder that may affect persons of all ages. Approximately 25 to 30% of persons who experience a traumatic event can develop PTSD.

In 1976, Terr et al. began the first prospective study in a group of children with PTSD, defining it as a complex interaction of cognitive, emotional and behavioral responses that constitute conscious and unconscious reactions in children in an effort to cope with the event that caused the trauma.<sup>1</sup>

<sup>1</sup> Facultad de Medicina, Universidad Autónoma de Chihuahua, Chihuahua, Mexico

<sup>2</sup> Departamento de Psicología Infantil,

<sup>3</sup> Departamento de Epidemiología, Hospital Infantil del Estado de Chihuahua, Chihuahua, México

*Correspondence:* Dr. Luis Carlos Hinojos-Gallardo  
Facultad de Medicina  
Universidad Autónoma de Chihuahua  
Chihuahua, Mexico  
E-mail: lchinojos@hotmail.com

Received for publication: 1-25-11

Accepted for publication: 6-28-11

The triggering event is known as a stressor and, according to its intensity, can be mild or severe. According to its persistence over time, it may be acute or chronic. In the presence of stress, the body produces an adaptive response that involves monitoring, focused attention, suppression of vegetative functions (feeding, reproduction), physical adaptation characterized by increased arterial pressure and heart rate and inhibition of the reproductive system and growth.

With regard to international classifications of mental disorders, incorporation of these types of syndromes has been slow. According to the DSM-I there is a category of "general reaction to stress," which is a reaction to fighting or civil disasters that may progress to a neurotic reaction if persistent. In DSM-II, traumatic reactions were minimized by reducing them to a temporary reaction, which was soon regarded as insufficient. In DSM-III, a specific category was created for the first time of "post-traumatic stress disorder" included in anxiety disorders. To make a diagnosis based on DSM-III, and later in DSM III-R, a severe stressor was required to exist that is outside the range of usual human experiences and creates a triad of symptoms: re-experiencing the event, persistent avoidance of stimuli associated with trauma and hyperexcitement (hyperarousal).

In relation to the triad of symptoms, re-experiencing or repetition of the event in children is expressed as flashbacks or intense reminders, typically expressed as an image associated with a limited vocabulary, repetitive play and traumatic re-enactment. Nightmares are frequent in those who have the memory repeated or aspects that are more or less covert of the event such as death, monsters and disasters. In addition, children may have dissociative states in which they repeated the event through daydreams and acted in the same or similar behaviors as the aspects of the traumatic situation. There are "flashbacks" and they present an intensification of the symptoms and hypersensitivity facing environmental stimuli associated with or symbolizing the trauma. An important feature of re-experiencing the trauma is that it may develop after a latency period of months or years.

The worldwide prevalence of PTSD at some point in life is 1-4%.<sup>1</sup> It varies according to such factors as the type of stressful event, age or gender.<sup>2,3</sup> In 1996, Savin et al. reported that Thailand had a PTSD prevalence of 71.7% in children from a Cambodian refugee camp,<sup>4</sup> whereas

Sack et al. reported a PTSD prevalence of 50% in children from the same source.<sup>5</sup>

Pynoss et al. evaluated school-age children who were attacked by a sniper and found a prevalence of PTSD of 94.3% in those who attended school that day, 45% in those who did not attend on that day and 89% in those who were inside the building.<sup>6</sup>

Children, especially those <8 years of age, cannot directly express PTSD symptoms such as re-experiencing or avoidance. Instead, they may express problems with sleep. Therefore, it is vital to take into account opportunities for identifying PTSD. This is common (>30%) for children who present in emergency departments for a traumatic injury.

The emergency department staff should inform parents or guardians of their child's risk for developing PTSD after attending the emergency department for their traumatic injury and advise them on what actions to take if symptoms appear.

Early identification of individuals at higher risk of PTSD and opportune intervention are a priority task in public mental health care, noting that delayed symptom onset may be as short as 1 week or as long as 30 years. Symptoms may fluctuate over time and become more intense during stressful periods. After a year, 50% of the patients have recovered. In general, children are more susceptible. Examples are infants who suffer burns; ~80% of these children will present data of posttraumatic stress 1 or 2 years after the event, whereas only 30% of adults that have suffered the same experience will suffer from this syndrome.<sup>7</sup>

Children with traumatic experiences such as domestic violence, violence from strangers, or loss of a family member due to violence or sexual abuse have a greater risk of later presenting behavioral problems, depressive disorders, personality disorders, substance abuse, suicide attempts or chronic pain syndromes.<sup>8,9</sup>

Prevalence studies show a rapid and economic diagnosis.<sup>10</sup> In the current study we analyzed cases with a diagnosis of PTSD at the Children's Hospital in the state of Chihuahua, Mexico during a 3-month period, its causes and characteristics, with the intention of identifying risk factors in the pediatric population and to achieve earlier identification of cases. In this way, we can initiate appropriate preventive and corrective treatment, thus reducing long-term consequences.

The objective of the current study was to identify factors associated with the development of PTSD in the pediatric population treated at the Department of Mental Health at the Children's Hospital of Chihuahua, Mexico.

## SUBJECTS AND METHODS

This was a retrospective cross-sectional study in which we analyzed the records of patients diagnosed with PTSD during a 3-month period (October-December 2010). The study took place at the Department of Pediatric Psychology at the HIECH. HIECH is a health care facility dedicated to children. The institution functions as a clearinghouse for state regional hospitals with attention focused on the area of pediatrics and pediatric specialties. The institution is a teaching center for pediatric specialties in coordination with the Faculty of Medicine for the National Autonomous University of Chihuahua.

The study analyzed the following variables:

1. Independent variable: diagnosis of PTSD
2. Dependent variables: characteristics such as gender, age, parental education, clinical history of psychological treatment of the patient, type of stress experienced

Frequencies and bivariate analysis studies were conducted. We included patients who fulfilled the diagnosis according to the DSM-IV characteristics. We excluded those patients with incomplete clinical files.

Data were analyzed using the SPSS statistical analysis program to identify prevalence of PTSD due to violence and the frequencies of each variable. Quantitative variables had calculations conducted for means and standard deviation (SD). Associations among variables were also analyzed.

### Ethical Considerations

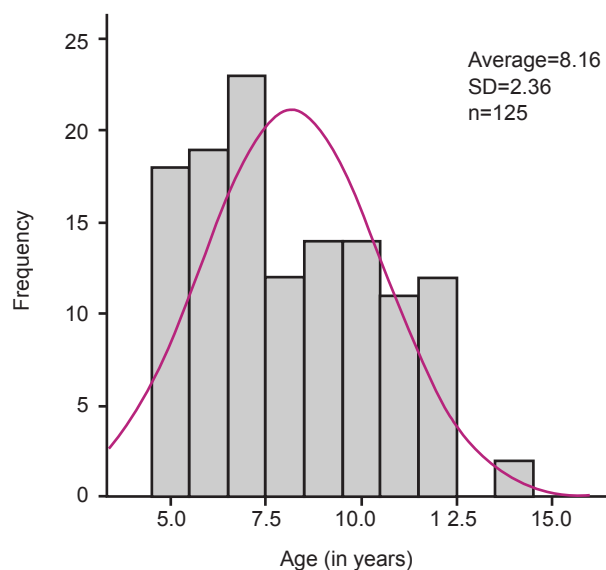
The study was conducted according to the ethical standards of the Helsinki Declaration (updated in Scotland, October 2000). The standard of patient confidentiality (no names were used or any other identifying information) was respected at all times. The study was submitted for approval by the committees of Health and Bioethics Research at HIECH and we obtained the certificate of approval from both committees. Children diagnosed with PTSD

received specialized follow-up care in the area of child psychology. Results of this intervention were beyond the scope of this study.

## RESULTS

We analyzed records of 125 patients who met the diagnostic criteria for PTSD. Of these, 52 (41.6%) were males and 73 patients (58.4%) were females. In 41.6% of the patients the triggering event was experienced or witnessed violence, whereas 58.4% were due to experienced or witness of an accident (100% were reported as auto accidents). Age of the patients ranged from 5 to 15 years with a higher number of patients being between 5 and 7.5 years of age (Figure 1).

Of the variables analyzed, we found that parental educational level of patients corresponded to the high mean levels, identifying only five patients (4%) whose parents had no education. Parents of the patients claimed to practice Catholicism in 83.2%, Protestantism in 14.4% and only 2.4% declared themselves as atheists. Patients from urban areas represented 93.6% of the study population and only 6.4% of the patients were rural residents. A more relevant fact was the family functionality, finding that 60.8% of the families were classified as integral and 39.2% as



**Figure 1.** Gaussian curve of the ages (in years) of 125 children with posttraumatic stress disorder (PTSD) treated at the Hospital Infantil, State of Chihuahua, Mexico.

dysfunctional. This classification of family functionality was based on the family tree diagram that was established based on the patient's clinical history. We considered a family as being integral when comprised of both parents living in the same nuclear household.

Bivariate analysis was conducted and analyzed the type of event in relation to the age of the patient. Younger subjects were most affected by violence than by accidents ( $p = 0.035$ , statistically significant). Likewise, male patients showed a higher tendency to develop PTSD secondary to accidents than to violence. For calculation of this association, we used  $\chi^2$  ( $p = 0.015$ , statistically significant). Furthermore, we noted that females presented an OR of 2.54 times greater for developing PTSD secondary to violence compared with males (95% CI). In our study, parental educational level results in being indiscriminate in relation to PTSD diagnosis (Figure 2).

In the analysis of family type, integral or dysfunctional, we found a higher prevalence of patients from dysfunctional families; nevertheless, this finding was not statistically significant (Figure 3).

## DISCUSSION

The most frequent age during which patients presented PTSD resulted to be school-age, which is also recognized by child psychologists as the time when the child is most receptive to his/her environment. In general, the literature reports differences as far as the age of the highest prevalence of PTSD according to several factors including type of study or measurement instrument used.<sup>10,11</sup> Likewise, it has been mentioned that the age when a child considered a situation as a stressor, i.e., if the event is experienced and not understood by the child or because of the child's age, he/she does not understand that his life or that of his family members was at risk. The child does not evaluate it as traumatic and this will be reflected in the child's emotional response to the event. Handford et al. reported that children <8 years old were not affected by the nuclear incident at Three Mile Island, possibly because they did not understand the risk they were exposed to.<sup>12</sup> Steward et al. proposed, in this respect, that the child who fails to understand the traumatic event assimilates it as various misinterpretations, which always cause some type of psychological disorder. An example of the latter is preschool-age children who experienced some type of sexual

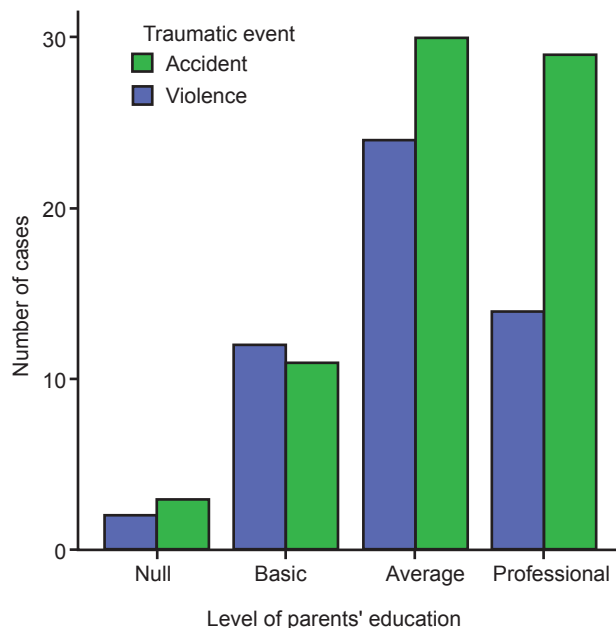


Figure 2. Parental educational level in relation to the diagnosis of PTSD.

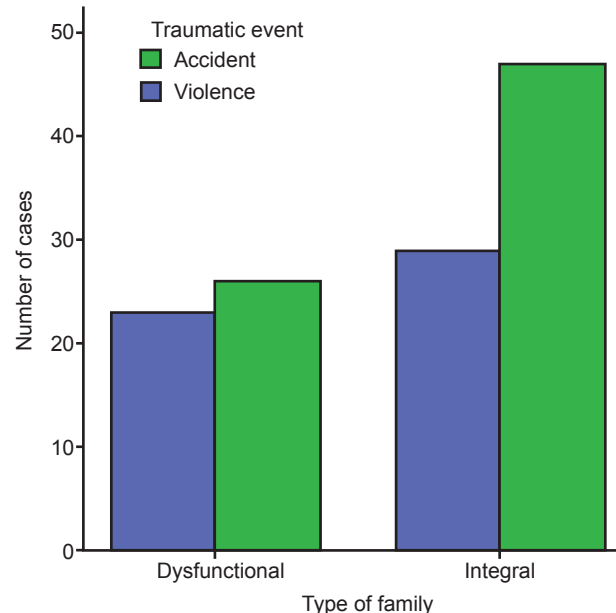


Figure 3. Type of family structure in relation with the diagnosis of PTSD.

abuse and, as a consequence, feel "all broken inside."<sup>13</sup> To date, we can find >50 published cases of children <4 years of age who have documented symptoms of PTSD.<sup>14,15</sup>

The type and intensity of the reaction of the parents can also have an effect on the value that the child has placed on the traumatic event.

Patient gender showed no significant difference according to the simple analysis; however, in the bivariate analysis it was struck by the tendency of males to show PTSD secondary to accidents rather than violence. The latter may be because males have greater exposure to games, video games and violent images. With regard to this interesting subject, Villani et al. suggested to even incorporate the pediatric clinical history to the type of media images to which the child is constantly exposed.<sup>16</sup> Recently, Joffre et al. published an interesting study of children from a secondary school where bullying behavior was identified (abuse or peer violence) and the associated characteristics and found that the preference for television programs or internet games with violent content was a risk factor that plays a role of aggressor in bullying.<sup>17</sup> The influence of violent images that children receive through television, video games or internet is an issue to be addressed further in future studies.

Contrary to initial hypotheses that aimed to show that the lower the level of parental education, the more likely the child will be to demonstrate data from PTSD, we found that there is no statistically significant relationship between this variable and PTSD. This allowed us to conclude that PTSD occurs at all societal levels regardless of parental educational level. A similar conclusion is made with the variable of family integrity. It was found that the fact that whether or not the family is integral is not a risk factor for developing PTSD.

The results obtained in this study demonstrate the importance of intentional searching for traumatic stress data in children with a history of some event that may lead to the development of PTSD, taking into consideration that the socioeconomic and cultural level or integrity of the family are not relevant for development of the disorder.

PTSD in the pediatric population has increased considerably in recent years;<sup>18-22</sup> however, we should include data from previous years that allow us to make an accurate statistical comparison. Appropriate identification of patients who present data suggestive of this diagnosis is of paramount importance in order to implement therapies in children that will help to avoid the psychological consequences described above. With regard to PTSD, in an outpatient setting, awareness of pediatric professionals

allows identification of those patients who should be assessed by a psychiatrist or child psychologist, both healthy children and in children who present with complaints of disease.

---

## REFERENCES

1. Terr LC, Bloch D, Oehlert J. Intuitive and counter-intuitive findings in 111 Columbine juniors. Program and abstracts of the American Academy of Child and Adolescent Psychiatry 49th Annual Meeting; October 22-27, 2002; San Francisco, CA. Symposium 4C.
2. Cohen JA, The Work Group on Quality Issues. Practice parameter for the assessment and treatment of children and adolescents with posttraumatic stress disorder. *J Am Acad Child Adolesc Psychiatry* 1998;37(suppl 10):4S-26S.
3. Helzer J, Robins L, McEvoy L. Post-traumatic stress disorder in the general population. *N Engl J Med* 1987;317:1630-1634.
4. Savin D, Sack WH, Clarke GN, Meas N, Richart I. The Khmer Project: III. A study of trauma from Thailand's Site II refugee camp. *J Am Acad Child Adolesc Psychiatry* 1996;35:384-391.
5. Sack WH, Him C, Dickason D. Twelve-year follow-up study of Khmer youths who suffered massive war trauma as children. *J Am Acad Child Adolesc Psychiatry* 1999;38:1173-1179.
6. Pynoos R, Frederick C, Nader K, Arroyo W, Steinberg A, Eth S, et al. Life threat and posttraumatic stress in school-age children. *Arch Gen Psychiatry* 1987;44:1057-1063.
7. Solano ME. Estrés postraumático en niños y adolescentes y sus consecuencias. *Hond Pediatr* 2004;24. Available at: <http://www.bvs.hn/RHP/pdf/2004/pdf/Vol24-2-2004-7.pdf>
8. Lampe A, Doering S, Rumpold G, Sölder E, Krismer M, Kantner-Rumplmair W, et al. Chronic pain syndromes and their relation to childhood abuse and stressful life events. *J Psychosom Res* 2003;54:361-367.
9. Dong M, Anda RF, Dube SR, Giles WH, Felitti VJ. The relationship of exposure to childhood sexual abuse to other forms of abuse, neglect, and household dysfunction during childhood. *Child Abuse Negl* 2003;27:625-639.
10. Salmon K, Bryant RA. Posttraumatic stress disorder in children. The influence of developmental factors. *Clin Psychol Rev* 2002;22:163-188.
11. Fletcher KE. Childhood posttraumatic stress disorder. In: Mash EJ, Barkley R, eds. *Child Psychopathology*. New York: Guilford Press; 2003. pp. 330-371.
12. Handford HA, Dickenson MS, Mattison RE, Humphrey FJ, Bagnato S, Bixler EO, et al. Child and parent reaction to the Three Mile Island nuclear accident. *J Am Acad Child Adolesc Psychiatry* 1986;25:346-356.
13. Steward MS. Understanding children's memories of medical procedures: "He didn't touch me and it didn't hurt!" In: Nelson CA, ed. *Memory and Affect in Development*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1993. pp. 171-225.
14. Coates S, Gaensbauer TJ. Event trauma in early childhood: symptoms, assessment, intervention. *Child Adolesc Psychiatr Clin North Am* 2009;18:611-626.

15. Scheeringa MS, Zeanah CH. Symptom expression and trauma variables in children under 48 months of age. *Infant Mental Health J* 1995;16:259-270.
16. Villani S. Impact of media on children and adolescents: a 10-year review of the research. *J Am Acad Child Adolesc Psychiatry* 2001;40:392-401.
17. Joffre-Velázquez VM, García-Maldonado G, Saldívar-González A, Martínez-Perales G, Lin-Ochoa D, Quintanar-Martínez S, et al. Bullying en alumnos de secundaria. Características generales y factores asociados al riesgo. *Bol Med Hosp Infant Mex* 2011;68:193-202.
18. Pérez-Olmos I, Fernández-Piñeres PE, Rodado-Fuentes S. Prevalencia del trastorno de estrés postraumático por la guerra, en niños de Cundinamarca, Colombia. *Rev Salud Pública* 2005;7:268-280.
19. Benjet C. Childhood adversities of populations living in low-income countries: prevalence, characteristics, and mental health consequences. *Curr Opin Psychiatry* 2010;23:356-362.
20. Kuterovac G, Dyregrov A, Stuvland R. Children in war: a silent majority under stress. *Br J Med Psychol* 1994;67:363-375.
21. Thabet AA, Vostanis P. Post-traumatic stress reactions in children of war. *J Child Psychol Psychiatry* 1999;40:385-391.
22. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. *Arch Gen Psychiatry* 1995;52:1048-1060.