

Acute Stress Disorder Symptoms in Children and Their Parents After Pediatric Traffic Injury

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ABSTRACT. *Objective.* The American Academy of Pediatrics highlights the important role of pediatricians in recognizing adverse child responses to tragic events, such as traffic crashes. One challenge in effectively identifying children and their parents with troubling psychological responses to trauma is that little is known about the normal range of acute psychological responses in children and their parents in the immediate aftermath of traumatic events, making identification of adverse child responses difficult. Within the first month after a traumatic event, individuals may display reexperiencing, avoidance, and hyperarousal symptoms as well as dissociation (eg, feelings of unreality or emotional numbing). The presence of these responses, collectively known as acute stress disorder (ASD), alerts providers to those who may be at risk for ongoing difficulties. For beginning to develop an evidence base to guide pediatric care providers in addressing acute traumatic responses, the aim of the current investigation was to describe systematically the range and type of symptoms of ASD in children and their parents after pediatric traffic injury.

Methods. A prospective cohort study was conducted of traffic-injured children, who were 5 to 17 years of age and admitted to the hospital for treatment of injuries from traffic crashes, and their parents. All children who met eligibility criteria between July 1999 and May 2000 were invited to participate in the study. After consent/assent was obtained, children and their custodial parents (or guardians) were interviewed within 1 month after injury via a structured assessment to determine the circumstances of the crash and the presence of ASD symptoms. Relevant demographic and clinical information (eg, age, race, gender, date of injury) was abstracted from the medical records of subjects. A survey instrument to assess the presence of ASD symptoms was completed by both the child and his or her guardian. All children completed the Child Acute Stress Questionnaire, and all parents completed the Stanford Acute Stress Reaction Questionnaire. Responses were scored for the presence of dissociation, reexperiencing, avoidance, and/or hyper-

arousal symptoms as well as broad distress (symptoms present in every category).

Results. Symptoms of ASD were commonly observed in the children and parents. Eighty-eight percent of children and 83% of parents reported having at least 1 clinically significant symptom; this affected 90% of the families. Broad distress was observed for a large minority: 28% of children and 23% of parents. No statistically significant association was found between child broad distress and either child age ($r = -0.12$) or child injury severity score ($r = -0.05$). χ^2 analyses revealed no significant association between broad distress and child gender, child race, or mechanism of injury. No statistically significant association was found between parent broad distress and child age ($r = -0.06$) or child injury severity score ($r = 0.09$). χ^2 analyses revealed no significant association between parent broad distress and child gender or parent presence at the crash scene. Associations were found between parent broad distress and race in that fewer white parents reported broad distress. In addition, mechanism of injury was associated with parent broad distress: more parents reported broad distress when their children were involved in pedestrian-motor vehicle crashes, and fewer parents reported broad distress when their children were injured in a bicycle fall.

Conclusions. Pediatric care providers can expect to see some ASD symptoms in most children and parents in the immediate aftermath of traffic-related injury. Brief education is appropriate to explain that these symptoms are normal reactions that are likely to resolve. If symptoms persist for >1 month or are particularly distressing in their intensity, then referral for psychological care may be necessary for treatment of posttraumatic stress disorder. Given the high prevalence of pediatric traffic crashes and the underdiagnosis of posttraumatic stress disorder, probing for recent crash exposure might be appropriate during routine child health maintenance. The following are recommendations for pediatricians: 1) routinely call the family several days and 1 to 2 weeks after a traffic injury and ask about behavioral symptoms and family function; 2) make use of the ongoing physician-patient relationship to explore symptom presence and intensity and any functional impairment in the injured child; a brief office visit with the child and parents could serve this purpose; 3) be sure to explore the effect that the child's injury has had on the family; remember that the parent's experience posttraumatic stress symptoms after pediatric traffic-related injuries and these symptoms may limit the parent's ability to support the child; 4) provide supportive care and give families the opportunity to discuss the crash and their current feelings; do not force families to talk about the crash; 5) although any child in a traffic crash or his or her parent is at risk for posttraumatic symptomatology, regardless of injury severity, par-

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ticular attention should be paid to the parents of child pedestrians who are struck by motor vehicles. These parents experience posttraumatic symptoms more commonly than parents of children in other traffic crashes. *Pediatrics* 2002;109(6). URL: <http://www.pediatrics.org/cgi/content/full/109/6/e90>; *posttraumatic stress disorder, accidents, traffic accidents, wounds and injuries, child, hospitalized, mental disorders.*

ABBREVIATIONS. PTSD, posttraumatic stress disorder; ASD, acute stress disorder; SASRQ, Stanford Acute Stress Reaction Questionnaire; CASQ, Child Acute Stress Questionnaire; AIS, Abbreviated Injury Scale; ISS, Injury Severity Score; MAIS, Maximal Abbreviated Injury Scale; CI, confidence interval.

The American Academy of Pediatrics highlighted the important role of pediatricians in recognizing child responses to tragic events (eg, the Columbine shooting,¹ disasters,² and the recent terrorist events³) that warrant clinical attention. Furthermore, the American Academy of Pediatrics instructs parents to observe how traumatic events, including crimes, traffic crashes, and disasters, affect not only the child but also the family.⁴ One challenge in effectively identifying children and their parents with troubling psychological responses to trauma is that there is little prospective research regarding the normal range of acute psychological responses in children and their parents in the immediate aftermath of traumatic events. As a result, those who care for trauma-exposed children, whether in the emergency or ambulatory setting, are ill-prepared to identify those with responses that warrant additional care and follow-up.

Posttraumatic stress disorder (PTSD) has been identified in children and adults as a constellation of symptoms that include reexperiencing (upsetting thoughts or feelings about the trauma), avoidance (of activities or other reminders of the traumatic event), and hyperarousal (sleep or concentration difficulties, hypervigilance) that persist and impair functioning.⁵ Recent evidence has pointed to the role that untreated stress symptomatology plays in poor health and functional outcomes in adults after trauma and highlights the importance of addressing the psychological as well as the physical consequences of injury.^{6,7} Within the first month after a traumatic event, individuals may display reexperiencing, avoidance, and hyperarousal symptoms, as well as dissociation (eg, feelings of unreality or emotional numbing). The presence of these responses, collectively known as acute stress disorder (ASD; Table 1), alerts providers to those who may be at risk for ongoing difficulties. In adults, the presence of ASD within the first month after a traumatic event seems to aid in prediction of later PTSD development⁸⁻¹¹; however, prospective data on the relationship between ASD and PTSD in children is not currently available. Similarly, although investigators have begun to describe the range of ASD symptoms in injured adults, far less is known about the occurrence of acute stress responses in injured children.

One of the most common traumatic events that children face is the traffic crash (involving pedestri-

TABLE 1. Diagnostic Criteria for ASD

- A. The person has been exposed to a traumatic event in which:
 - 1) s/he experienced, witnessed, or was confronted with an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
 - 2) his/her response involved intense fear, helplessness, or horror
- B. Either during or after the distressing event, the individual has 3 (or more) of the following dissociative symptoms:
 - 1) subjective sense of numbing, detachment, or absence of emotional responsiveness
 - 2) reduction in awareness of his or her surroundings (eg, "being in a daze")
 - 3) derealization
 - 4) depersonalization
 - 5) dissociative amnesia (ie, inability to recall an important aspect of the trauma)
- C. The traumatic event is persistently reexperienced in at least 1 of the following ways: recurrent images, thoughts, dreams, illusions, flashback episodes, or a sense of reliving the experience; or distress on exposure to reminders of the traumatic event.
- D. Marked avoidance of stimuli that arouse recollections of the trauma (eg, thoughts, feelings, conversations, activities, places, people).
- E. Marked symptoms of anxiety or increased arousal (eg, difficulty sleeping, irritability, poor concentration, hypervigilance, exaggerated startle response, motor restlessness).
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or impairs the individual's ability to pursue some necessary task, such as obtaining necessary assistance or mobilizing personal resources by telling family members about the traumatic experience.
- G. The disturbance lasts for 2 days to 4 weeks and occurs within 4 weeks of the traumatic event.
- H. The disturbance is not attributable to the direct physiological effects of substance, or a general medical condition or other preexisting psychiatric condition.

Adapted from the American Psychiatric Association.⁵

ans, bicyclists, and motor vehicle occupants): >300 000 children are injured in traffic crashes each year in the United States,¹² and many more are exposed to the trauma of a crash without sustaining physical injury.¹³ Researchers have recognized the long-term behavioral and psychological consequences of pediatric traffic injury.^{14,15} In particular, one quarter to one third of all traffic-injured children^{16,17} and 15% of their parents¹⁶ develop PTSD. The high incidence of crashes that involve children and the propensity for these events to result in psychological sequelae highlight the need for providers to be able to distinguish between those who have normal from those who have abnormal adverse reactions to trauma and may need additional care.

To date, only 4 published prospective investigations have assessed acute stress symptoms in children with a recent traumatic injury: Daviss et al¹⁸ gathered parent- and nurse-reported data on ASD symptoms in 54 children who were hospitalized for injury, Fein et al¹⁹ assessed ASD symptoms in 81 children and youth in the emergency department within hours of a violent injury, Robert et al²⁰ evaluated several acute stress symptoms in a large cohort of children who were hospitalized for burn injuries to identify those who might benefit from psychopharmacologic treatment, and DiGallo et al²¹ assessed PTSD symptoms in 57 children within 2

weeks of a traffic crash. These studies reported between 10% and 30% prevalence of significant acute distress in children postinjury (cross-study comparisons are made difficult by variation in assessment strategy, time frame, and symptom coverage). No previous study has reported the prevalence of ASD symptoms in parents after a child is injured. The current study addresses gaps in previous studies and extends the limited knowledge base regarding acute stress in children after a traffic crash injury by using child self-report of the full range of ASD symptoms and by including assessment of parent ASD symptoms. For beginning to develop an evidence base to guide pediatric care providers in addressing these acute traumatic responses, our investigation systematically describes the range and type of ASD symptoms in children and their parents after traffic injuries.

METHODS

This study is part of an ongoing prospective research program concerning posttraumatic stress in children and their parents after hospital admission for pediatric traffic injury. All children who were between the ages of 5 and 17 years and admitted to a large urban pediatric hospital for treatment of traffic-related injuries and did not meet exclusion criteria were invited to participate in the study. Modes of injury included in this study were motor vehicle crashes in which the child was an occupant, motor vehicle-pedestrian crashes, motor vehicle-bicyclist crashes, and bicycle falls without motor vehicle involvement. Children were excluded from the study when they or their parents did not speak English, when the child had cognitive limitations that would preclude responding to an interview, or when they lived beyond a 2-hour travel distance from the hospital (because enrollment in the larger study involved 2 in-home assessments by study interviewers). Parents were asked for consent for their own and their child's participation according to a protocol approved by the Institutional Review Board of The Children's Hospital of Philadelphia. Only 1 parent or guardian per child was interviewed. To be eligible to participate, an adult had to be a custodial parent (or guardian), live with the index child, have (or share) primary responsibility for the child's care, and speak English well enough to complete an interview. Interviewers spoke to the first available parent (or guardian) who met these criteria. Throughout this article, the term "parent" refers to any parent or guardian who participated in the study.

After consent was obtained from a parent, the study was explained to the injured child and his or her consent/assent was requested. Both parent and child were interviewed at their earliest convenience after consent was obtained. Symptoms of ASD in the child and the available parent were assessed by trained interviewers using the interview protocol described below. The interview included a short questionnaire regarding the circumstances of the crash, including mode of injury, the child's report of whether any parent was present at the crash scene, and the reporting parent's presence at the scene. Relevant demographic and clinical information (eg, age, race, gender, date of injury) was abstracted from the medical records of participants.

All interviewers completed a 2-day training session and demonstrated mastery of protocol content and adherence (as assessed by a doctoral-level, clinical psychologist [N.K.-A.]). Quality assurance of adherence to standardized interview protocols was assessed via ongoing review of audiotaped interviews and by in-person monitoring by a senior survey researcher.

Acute Stress Measures

Symptoms were assessed across the 4 categories that compose ASD: dissociation, reexperiencing, avoidance, and hyperarousal (see Table 1). As part of the acute assessment, each participant completed survey instruments designed to assess the presence of acute stress symptoms.

Parent/Guardian Acute Stress

The Stanford Acute Stress Reaction Questionnaire (SASRQ)²² is a 30-item symptom checklist designed to assess acute stress symptoms in adults. Each item is rated on a 6-point Likert-type scale, from 0 ("never") to 5 ("very often") and corresponds to 1 of the 4 ASD symptom categories. The SASRQ is a commonly used measure of ASD symptoms in adults. It has demonstrated excellent internal consistency (α coefficients range from 0.80 to 0.95 for the total scale), adequate test-retest reliability ($r = 0.69$ over 3–4 weeks in a sample of college students with no intervening traumas), and strong evidence for its validity as a measure of acute posttraumatic stress in adults.^{22–24}

Child Acute Stress

The student version of the SASRQ,²⁵ a measure of acute posttraumatic stress severity for children ages 9 to 15, was adapted for use in the current study, resulting in the 48-item Child Acute Stress Questionnaire (CASQ). The 30 Student SASRQ questions were reworded to present tense to assess current symptoms, and its 5-point response scale was changed to a simpler 3-point scale to be more appropriate for the full age range of children assessed in the current study. Eighteen items were added to increase coverage of 2 key aspects of ASD: peritraumatic dissociation and fear, helplessness, or horror experienced at the time of a traumatic event. Each item of the CASQ is rated on a 3-point Likert-type scale (0 = "not true," 1 = "sometimes or somewhat true," and 2 = "very or often true") and corresponds to 1 of the 4 ASD symptom categories. Examples of CASQ items are presented in Table 2. The CASQ is available on request from the authors.

Initial psychometric data on this modified measure is promising. Internal consistency was excellent for the 48-item CASQ, both in the current study sample and in a separate group of 104 injured children assessed by the authors (Cronbach's $\alpha = 0.94$ in each of these samples). The stability of CASQ ratings was evaluated in a separate sample of 40 recently injured children who were reassessed 1 to 7 days after an initial assessment. Test-retest reliability of the CASQ total score (sum of item ratings) was high ($r = 0.79$, $P < .0005$), and there was moderate agreement between test and retest administrations regarding the presence or absence of broad distress ($\kappa = 0.69$, $P < .0005$). Preliminary principal components analyses with the CASQ have been undertaken in a sample of 200 injured children. These analyses provide general support for the construct validity of the measure. Principal components analysis (with varimax rotation) suggested 4 posttrauma components (re-experiencing and avoidance, dissociation and numbing, attention difficulties and arousal, and flashbacks) and peritrauma components (dissociation, fear/helplessness/horror, and an altered sense of time).

Scoring of Symptom Presence (CASQ and SASRQ)

Individual symptom items were considered to denote clinically significant distress if the score was a "2" for the CASQ (0–2 scale) or a "3" or higher for the SASRQ (0–5 scale). Each symptom category (dissociation, reexperiencing, avoidance, and hyperarousal) was scored as "present" if at least 1 clinically significant

TABLE 2. Examples of CASQ Items for Each ASD Symptom Category

Category	Example
Subjective experience of fear, helplessness, horror	I felt really scared.
Peritraumatic dissociation	What was happening seemed unreal to me, like I was in a dream or watching a movie.
Current (posttrauma) dissociation	Right in the middle of doing things, I suddenly can't remember what I was doing.
Reexperiencing	I feel really upset if I see something that reminds me of what happened when I was hurt.
Avoidance	I try to avoid doing things that remind me of what happened.
Hyperarousal	I feel jumpy—I get startled easily.

symptom was reported within that category. If fewer than half of the items in a symptom category were completed, then the category was not scored as either present or absent (and that child or parent was not included in later analyses of cases with complete acute stress symptom data). Parents or children were classified as experiencing "broad distress" when all 4 acute stress symptom categories were present.

Injury Measures

Each medical record was abstracted for all injury diagnoses by a trauma registrar with more than a decade of experience. The corresponding *International Classification of Diseases, Ninth Revision*, codes were mapped to the Abbreviated Injury Scale (AIS) and its derivative, the Injury Severity Score (ISS).^{26–28} The AIS and ISS are widely used to classify injury severity. The AIS rates the severity of an anatomic injury from 1 (minor injury) to 6 (fatal injury) for each of 6 body regions: head/neck, face, chest, abdomen, extremities/pelvic girdle, and external. An AIS score ≥ 2 is considered to pose a clinically significant threat to life (eg, concussion or worse brain injury, all fractures, abdominal organ injury). Because multiple injuries can occur within 1 body region, the Maximal Abbreviated Injury Scale (MAIS) is defined for each body region. A MAIS score of 0 was assigned when no injury occurred in a given body region. The ISS is defined as the sum of the squares of the MAIS from the 3 body regions with the most severe injuries and serves as a well-recognized measure of overall injury severity. Both AIS and ISS have proved reliable and valid as measures of injury severity in children.²⁹

Statistical Methods

Descriptive statistics (frequencies, percentages, exact binomial 95% confidence intervals [CIs]) were calculated for demographic, injury circumstance, and acute stress symptom variables. Participant families were compared with families who were eligible for participation but not enrolled in the study (Exact χ^2 or Kruskal-Wallis tests for comparisons of categorical variables, and *t* tests for continuous variables). A determination of the presence or absence of "broad distress" was computed on the basis of acute stress symptoms reported by the child or parent, respectively. The association of broad distress with various demographic and injury characteristics was examined using point biserial correlations for age and injury severity and using exact χ^2 analyses for all categorical variables. Agreement between parent and child broad distress was assessed using an exact McNemar test. Analyses were performed with SPSS Version 10.0 (SPSSInc, Chicago, IL) and StatXact Version 4.0 (Cytel, Cambridge, MA).

RESULTS

Study Population

Between July 1999 and May 2000, 212 children were admitted to the hospital for traffic-related injuries and met all other eligibility criteria for the study. For 97 of the eligible 212 children, complete acute stress symptom data were collected from the child ($n = 95$) and/or the parent ($n = 94$). The remaining 115 children were not included in the present analyses. For 68 children, parents could not be contacted despite repeated attempts, or an acute stress interview could not be completed at the family's convenience, within 1 month of the child's injury. For 35 children, parents refused participation in the study. For 12 children, incomplete acute stress data were obtained from the child or the parent. There were no significant differences on age, gender, mode of injury, or admission to the intensive care unit (for all tests, $P > .05$) between children from these 97 participating families and the 115 eligible children who were not included in these analyses. The group included in the study had a lower proportion of black children (44% vs 62% for those not included; $P = .04$). There was a significant difference ($P = .02$) in the

median income (by zip code) such that families who resided in zip codes with higher incomes were more likely to become study participants.

Table 3 summarizes characteristics of the study participants. The age range was 5 to 17 years (mean age: 10.4; standard deviation: 3.3). The length of inpatient admission ranged from 1 to 35 days. Median length of stay was 2 days; 50% of study participants stayed in the hospital between 1 and 4 days. Of the children in the study, 35% required an admission to the intensive care unit. ISS ranged from 1 to 25 (mean ISS: 8.6; standard deviation: 5.9). In the majority of cases (68%), the reporting parent was the mother; 25% were fathers; and 7% were either the grandmother or another female guardian. For 32 children (33%), a parent (or legal guardian) was present at the crash. Among responding parents, 15 (16%) were present at the crash in which their child was injured. (Note: As 1 parent per child was interviewed, there may have been another parent present at the crash but not participating in the study.) Interviews were conducted between 3 and 30 days postinjury (median: 13 days); 50% of study participants were interviewed between 10 and 19 days postinjury.

Acute Stress Symptoms in Children

Table 4 summarizes the frequency of acute stress symptoms in the children. Eighty-four children (88%; 95% CI: 0.80–0.94) reported symptoms present (at the clinically significant level corresponding to "very or often true") in at least 1 of the 4 ASD symptom categories. Dissociation was the symptom category that was most often reported to be present by children, with the remaining symptom categories reported as present approximately equally. Twenty-seven children (28%; 95% CI: 0.20–0.39) experienced broad distress (at least 1 clinically significant symptom in every category).

No statistically significant association was found between child broad distress and child age ($r = -0.12$, $P = .23$) or child ISS ($r = -0.05$, $P = .64$). χ^2

TABLE 3. Participant Characteristics

Characteristic	n (%) (N = 97 [100])
Gender	
Male	70 (72)
Female	27 (28)
Race	
Black	43 (44)
White	48 (50)
Hispanic	1 (1)
Asian	1 (1)
Other	4 (4)
Mode of injury	
Motor vehicle crash-child occupant	23 (24)
Motor vehicle-pedestrian crash	32 (33)
Motor vehicle-bicyclist crash	14 (14)
Bike fall	28 (29)
Median income in area of residence (by zip code)	
\leq \$20 000	14 (14)
\$20 001–\$40 000	55 (57)
\geq \$40 001	24 (25)
No information available	4 (4)

TABLE 4. Number (%) of Children or Parents Reporting ASD Symptoms

	Child (<i>n</i> = 95)		Parent (<i>n</i> = 94)	
	Clinically Significant Symptoms (Score of 2 on 0–2 Scale)		Clinically Significant Symptoms (Score of 3, 4, 5 on 0–5 Scale)	
	<i>n</i> (%)	95% CI	<i>n</i> (%)	95% CI
Dissociation	74 (78)	68, 86	37 (39)	29, 50
Reexperiencing	48 (51)	40, 61	51 (54)	44, 65
Avoidance	50 (53)	42, 63	40 (43)	32, 53
Arousal	50 (53)	42, 63	69 (73)	63, 82
Broad distress*	27 (28)	20, 39	22 (23)	15, 33

* At least 1 clinically significant symptom present in each symptom category.

analyses revealed no significant association between broad distress and child gender ($P = .80$), child race ($P = .42$), or mechanism of injury ($P = .16$).

Acute Stress Symptoms in Parents

Table 4 shows the frequency of acute stress symptoms among parents who participated in the study. Seventy-eight parents (83%; 95% CI: 0.74–0.90) reported symptoms present (at the clinically significant level) in at least 1 of the 4 ASD symptom categories. Arousal was the symptom category that was most often reported to be present for parents, and dissociation was least often present. Twenty-two parents (23%; 95% CI: 0.15–0.33) experienced broad distress (at least 1 clinically significant symptom in every category).

No statistically significant association was found between parent broad distress and child age ($r = -0.06$, $P = .56$) or child ISS ($r = .09$, $P = .44$). χ^2 analyses revealed no significant association between parent broad distress and child gender ($P = 1.0$) or parent presence at the crash scene ($P = .18$). Associations were found between parent broad distress and race ($P = .004$) in that fewer white parents reported broad distress. In addition, mechanism of injury was associated with parent broad distress ($P = .005$): more parents reported broad distress when their children were involved in a motor vehicle-pedestrian crash, and fewer parents reported broad distress when their children were injured in a bicycle fall.

Relationship Between Parent and Child Symptoms

In 87 of the 97 families in this study (90%; 95% CI: 0.82–0.95), either child or parent (or both) reported at least 1 clinically significant acute stress symptom. Table 5 describes the relationship between child and parent acute stress symptoms in the 92 families in which both child and parent data were available. For 9 families (10%; 95% CI: 0.05–0.18), both parent and child had clinically significant symptoms across multiple symptom categories. In 55 of the pairs (60%;

95% CI: 0.49–0.70), neither parent nor child experienced broad distress. A McNemar test revealed no significant association between parent and child reports of broad distress ($P = .57$).

DISCUSSION

Acute stress responses seem to be normative within the first month after a pediatric traffic injury in that more than four fifths of injured children and their parents experienced at least 1 symptom of clinically significant acute posttraumatic distress. For a large minority of the injured children and their parents, symptoms were more severe: in approximately 40% of the families, at least 1 person (either child or parent) had clinically significant symptoms across multiple symptom categories (28% of children and 23% of parents). These results begin to develop a foundation for understanding normal and abnormal acute stress responses in children and their parents after a traumatic injury.

Few published studies to date have described self-reported acute stress symptoms in children within the first month after a traumatic injury, and none have reported specifically on diagnostic ASD in children or parents. Robert et al³⁰ found that 10% of 403 children who were hospitalized for acute burn injury experienced “ASD symptoms” that lasted for at least 2 days, across multiple assessment points. DiGallo et al²¹ assessed PTSD symptoms in 57 children 2 days to 2 weeks after the child was injured in a traffic crash. They reported that 18% had moderate to severe posttraumatic stress symptoms and another 17% had mild symptoms. Fein et al¹⁹ evaluated 81 youths during emergency department treatment for violent injury, with 30% reporting broad acute stress symptoms. Our finding that 28% of children reported a full range of clinically significant acute stress symptoms is generally consistent with this previous work and adds to this emerging literature on the occurrence of significant acute stress responses after pediatric injury.

TABLE 5. Relationship Between Parent and Child Clinically Significant Acute Stress Symptoms

Parent Symptoms <i>n</i> (% of Families)	Child Symptoms (<i>n</i> [% of Families])		
	Broad Distress Not Present	Broad Distress Present*	Total
Broad distress not present	55 (60)	16 (17)	71 (77)
Broad distress present*	12 (13)	9 (10)	21 (23)
Total	67 (73)	25 (27)	92 (100)

* At least 1 clinically significant symptom present in each symptom category.

The current study extends these previous results by describing acute stress responses in both children and their parents and examining their co-occurrence. Understanding the response of parents is important because it may influence that of the child. A strong relationship has been reported between parent functioning (including parents' posttraumatic stress symptoms) and later child posttraumatic stress after a variety of traumatic experiences.³¹⁻³⁴ The current results suggest that child and parent acute stress symptoms do not always co-occur; therefore, assessing the relative contributions of child and parent acute responses to later child outcomes is an important question for future investigation.

Limitations and Suggestions for Future Research

This study addressed acute stress responses in an urban and suburban population, in a sample that consisted primarily of black and white children and parents. Similar studies among children and parents in rural settings and in other ethnic populations would be useful. The generalizability of the estimates of prevalence found in this study may be limited by the inclusion of 46% of the eligible population. The study sample consisted of a fairly diverse group of children and parents in terms of ethnicity and socioeconomic status but included fewer subjects from lower income neighborhoods and fewer blacks than were eligible for enrollment. The current study involved only 1 parent or guardian per child. It is possible that another parent's responses may vary substantially or may have a differential impact on the child's recovery. Involving more immediate family members (ie, both parents, siblings) would provide a more complete picture of child and family acute stress responses after injury. Because most participating parents were mothers, the generalizability of these results to fathers of injured children is less certain.

Because no existing survey instrument was validated for assessment of acute stress symptoms in 5- to 17-year-old children, an instrument initially designed for children 9 years and older but modified to be appropriate for children 5 to 8 years of age was used. Although initial psychometric assessment of this modified tool is promising, additional testing of the modified instrument would enhance further the validity and reliability of the results reported. Future research should address potential moderators of acute posttraumatic reactions, including previous traumatic experiences of children or their parents. Future work might also examine the role of acute stress symptoms in predicting later PTSD development.

Implications for Practice

Pediatricians should be on the alert to identify those with persistent and distressing responses to a traumatic event experienced by an individual child and family, such as a traffic crash, as well as to events that affect the broader community, such as the recent terrorist attacks in the United States.⁴ All families require emotional support when a child is exposed to a traumatic event. As evidenced by the findings in

this study, pediatric care providers can expect to see at least a few significant acute stress symptoms in most children and parents in the early aftermath of traffic-related injury. In this situation, brief education is appropriate to explain that these are typical reactions and are likely to resolve as the physical injuries heal and as the family uses its normal coping methods to deal with the immediate shock. In addition, our data suggest that approximately one quarter of children or parents will experience more pervasive reactions and significant distress in the immediate aftermath of a traffic crash. Pediatric providers can prepare parents to be observant of their own and their child's reactions by briefly reviewing symptoms of reexperiencing, avoidance, hyperarousal, and dissociation. Parents and children with persisting distress also may be reassured by a personal referral to a trusted behavioral health provider who specializes in treating families who have experienced a trauma. Given previous research findings that link untreated posttraumatic stress symptoms with poorer health and functional outcomes,¹⁶ referral for psychological care when a parent or child reports significant acute stress symptoms should be part of thorough medical follow-up for pediatric traffic injuries.

The following are recommendations for pediatricians:

1. Routinely call the family several days and 1 to 2 weeks after a traffic injury and ask about behavioral symptoms and family function.
2. Make use of the ongoing physician-patient relationship to explore symptom presence and intensity and any functional impairment in the injured child. A brief office visit with the child and parents could serve this purpose.
3. Be sure to explore the effect that the child's injury has had on the family. Remember that parents experience posttraumatic stress symptoms after pediatric traffic-related injuries, and these symptoms may limit the parent's ability to support the child.
4. Provide supportive care and give families the opportunity to discuss the crash and their current feelings. Do not force families to talk about the crash.
5. Although any child in a traffic crash or his or her parent is at risk for posttraumatic symptomatology, regardless of injury severity, particular attention should be paid to the parents of child pedestrians who are struck by motor vehicles. These parents experience posttraumatic symptoms more commonly than parents of children in other traffic crashes.

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