Acute Stress Disorder Symptomatology During Hospitalization for Pediatric Injury

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ABSTRACT

Objective: To examine and identify predictors of acute stress disorder (ASD) and ASD symptomatology (ASDS) in children hospitalized for injuries. **Method:** Fifty-four youths were assessed while hospitalized for injuries. Dependent variables were parent and nurse ratings of children's ASDS. Independent variables included children's prior trauma exposure and behavior problems, injury severity and permanence, brain injury, injury or death to family/friend(s), parental distress, and child reports of the injury/hospitalization experience as meeting criterion A for ASD. **Results:** A total of 92.6% of children felt the current experience met criterion A, compared with 64.8% of parents. According to parent questionnaires, 4 subjects (7.4%) met *DSM-IV* criteria for ASD while another 12 (22.2%) had clinically significant but subsyndromal ASDS. Children's ASDS, as reported by parents, correlated highly with parental distress and ratings of children's prior psychopathology, and modestly with injury severity and family/friend(s) injured or killed. Nurses' ratings of children's ASDS correlated strictly with injury- and accident-related variables, and not with parent ratings of children's ASDS. **Conclusions:** Children perceive injuries and hospitalizations as stressful. ASDS is widely though divergently reported by parents and nurses in children hospitalized for injury. Parental distress, children's prior psychopathology, and injury-related factors may be useful predictors of children's postinjury ASDS. *J. Am. Acad. Child Adolesc. Psychiatry,* 2000, 39(5):569–575. **Key Words:** acute stress disorder, injury.

Acute stress disorder (ASD) was introduced as a new diagnosis to describe symptoms occurring 2 to 28 days after a psychologically traumatic experience (*DSM-IV*) (American Psychiatric Association, 1994). The traumatic experience must involve actual or threatened death or serious injury or other threat to physical integrity (criterion A1) and must be accompanied by intense fear, horror, or helplessness (criterion A2). The patient must have at least 3 dissociative symptoms (criterion B), which could include depersonalization, derealization, dissociative amnesia, seeming dazed or with reduced awareness of surroundings, and feelings of detachment or emotional numbing. Additional diagnostic criteria include at least one symptom in the reexperiencing (criterion C), avoidance (criterion D), and anxiety/hyperarousal (criterion E) categories. The symptoms must cause significant distress or impairment (criterion F) and not be due to a general medical condition or other psychopathology (criterion G).

The diagnostic criteria for ASD were compiled on the basis of limited empirical evidence in adults suggesting that immediate dissociative and other posttraumatic symptoms predicted later posttraumatic stress disorder (PTSD) (Bryant and Harvey, 1997). Some recent studies of acutely traumatized adults (Bryant and Harvey, 1998; Classen et al., 1998) and children (DiGallo et al., 1997; Max et al., 1998) have supported the notion that ASD symptomatology (ASDS) predicts subsequent PTSD. The early identification of ASDS and its risk factors thus might help to direct therapeutic interventions toward traumatized patients at greatest risk of continued posttraumatic symptoms.

One might presume that the same variables that predict later PTSD would also predict more immediate ASD and ASDS. However, unlike PTSD, ASD occurs more immediately after traumatic exposure and requires the presence

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of at least 3 dissociative symptoms. Therefore, ASD may not share the same predictors. Moreover, certain potential predictors may apply only to specific age groups. In studies with children, for example, variables that have consistently been predictive of subsequent PTSD have included parental distress and parental psychopathology. Additional predictors of childhood PTSD have resembled those of adulthood PTSD, including the degree of the traumatic exposure and (inversely) the span of time after the traumatic exposure (Foy et al., 1996). Two additional risk factors, prior trauma exposure (Boney-McCoy and Finkelhor, 1995; Nader et al., 1990) and prior child psychopathology (Boney-McCoy and Finkelhor, 1996; Earls et al., 1988), have also been suggested. At this point, however, there are no published studies specifically examining predictors of ASD or ASDS in children, underscoring the need for empirical research in this area.

Injured children are an especially logical group to study such predictors of ASD or PTSD. Injuries are a common traumatic experience of childhood, resulting in more than 600,000 hospital admissions annually in the United States (Division of Injury Control, 1990). Empirical studies examining the predictors of PTSD in injured children have identified many of the same risk factors that have been reported in the general childhood PTSD literature, including acute parental distress (Martini et al., 1990; Rossman et al., 1997), prior child psychopathology (Max et al., 1998; Martini et al., 1990), and degree of acute traumatic exposure (Rossman et al., 1997). However, the generalizability of such findings is limited by the use of small case studies (Martini et al., 1990), mixed samples of injured and noninjured youths (Rossman et al., 1997), samples with a narrow range of injuries or accidents (DiGallo et al., 1997; Martini et al., 1990; Rossman et al., 1997), or samples exclusively with traumatic brain injuries (Max et al., 1998). None have focused on predictors of ASDS during the early period of the hospitalization when it would presumably be most pronounced, and none have examined prior traumatization as a predictor.

In this report, we present findings from the first phase of a prospective study to assess the psychiatric consequences of children and adolescents hospitalized with injuries. Our objective was to assess ASDS in children hospitalized for acute injuries and to explore its association with predictors that have been linked to PTSD in children. We hypothesized that children's ASDS during the hospitalization, as rated by parents and nurses, would be predicted by breadth of prior trauma exposure, prior psychopathology, injury severity and permanence, brain injury, injury or death to family/friend(s) in the accident, children's subjective perceptions of the current trauma, and postinjury parental distress.

METHOD

Subjects

Participants were drawn from a sample of injured pediatric patients admitted at least overnight to Dartmouth Hitchcock Medical Center (DHMC) between August 1, 1996, and September 15, 1997. Patients aged 7 to 17 years were eligible. Patients with persistent delirium, pervasive developmental disorders, or mental retardation were excluded. Also excluded were patients living more than a 90-minute drive away. Of the 132 eligible children, 66 were discharged before they could be recruited. Another 12 refused to take part. Fifty-four subjects completed round 1, which took place in the hospital. Enrolled and nonenrolled patients did not differ in age or gender. Our sample consisted of 18 girls and 36 boys. Ages ranged from 7 to 17 years, with a mean of 13.4 (SD = 3.2). Race was predominantly white (94.4%), with 2 Asian subjects and 1 Native American, mirroring the demographics of our geographic region. Twenty-eight children (51.9%) lived with 2 parents, 15 (27.8%) with a single parent, 9 (16.7%) with a parent and stepparent, and 2 (3.7%) with foster parents. Thirty-five children (64.8%) had insurance, while 19 (35.2%) had either no insurance or Medicaid.

A pediatric surgeon (D.M.) rated children's *injury severity* using the Injury Severity Score (ISS) (Baker et al., 1974). This index calculates 3 different domains of injury based on bodily systems. Scores of the 3 domains are squared, then summed to obtain total scores ranging from 0 to 75, with higher scores signifying higher levels of injury severity. ISS of enrolled patients ranged from 1 to 45, with a mean of 15.2 (SD = 14.9). The enrolled sample's mean ISS was significantly higher than the mean ISS of those not enrolled, which was 12.6 (SD = 9.2) ($t = 2.81, p = .006$), inasmuch as many nonenrolled children with less serious injuries were discharged before they could be recruited.

Hospitalizations in our sample were for injuries related to car accidents ($n = 24$; 44.4%); auto–pedestrian or auto–bicyclist collisions ($n = 8$; 14.8%); falls ($n = 7$; 13.0%); winter sports accidents involving sledding, skiing, or snow-boarding ($n = 6$; 11.1%); accidental gunshots ($n = 2$; 3.7%); and burns or explosions ($n = 2$; 3.7%). Additional accidental injuries included being struck by a golf ball, run over by a motor boat, injured playing softball, injured using a wood-splitter, or assaulted by 2 peers in a fight at school. Two children (3.7%) had lost a parent as a result of their accident, 4 (7.4%) had family members seriously injured, and 10 (18.5%) had at least one friend seriously injured. Twenty-four subjects (44.4%) experienced a brain injury. Eighteen (33.3%) had injuries resulting in lasting physical damage or disfigurement. Twenty-four (44.4%) experienced at least one significant medical procedure.

Procedure

The study's consent form and protocol were approved by DHMC's Committee for the Protection of Human Subjects. The parents of potential participants were approached by a pediatric surgeon (D.M.) and told that the study was investigating children's emotional adjustment to their physical injuries. Parents were offered $25 for participating. Assessments described in this report occurred while the patient was in the hospital. A second round of assessments occurred 4 or more weeks after the first round, during an outpatient visit, and are reported in another article (Daviss et al., 2000).

Outcome Variables

Children's Acute Distress Disorder Symptomatology. Parents completed the Child Stress Reaction Checklist (CSRC-P) developed by Saxe and colleagues (1997) as the primary determinant of ASDS and ASD diagnostic status. With this 30-item measure, parents rank their child's acute stress symptoms on a 3-point, Likert-type scale (0 = "not true," 1 = "somewhat true," and 2 = "very true") (range of possible scores: 0–60), with higher total scores indicating more ASDS. In a sample of 17 children hospitalized for burn injuries, test-retest reliability for the total scores of the CSRC-P was adequate ($r = 0.82$), and convergent validity was suggested by the strong correlation ($r = 0.84$) with another child PTSD measure (Saxe et al., 1997). In our sample, the internal consistency of the CSRC-P was high ($\alpha = .91$). The child's primary nurse completed a shorter version of the CSRC, the CSRC-N (Saxe et al., 1997), within a week of the child's admission or at the time of discharge, whichever came first. The CSRC-N's 25 items are scored on a 4-point, Likert-type scale (0 = "never" to 3 = "very often") (range of possible scores: 0–75), with higher scores again reflecting greater ASDS severity. The internal consistency of the CSRC-N in our sample was also high ($\alpha = .93$).

Predictor Variables

Children's Appraisal of Current Trauma; Types of Prior Traumatization. Each child was interviewed by a clinician using the Traumatic Events Screening Inventory for Children (TESI-C) (Ford and Rogers, 1997). The TESI-C is a 15-item, semistructured interview that inquires about a variety of traumatic events including current and previous injuries, hospitalizations, domestic violence, community violence, disasters, accidents, physical abuse, and sexual abuse. Additional questions determine whether any reported event involved a threat to the child or others' physical integrity (criterion A1 for ASD/PTSD) and whether the child's emotional reactions included extreme fear, helplessness, horror, confusion, or agitation (criterion A2). All clinicians doing in-hospital TESI-C interviews (W.B.D., A.F., R.R., J.D.F., and 3 psychiatry residents) had undergone a half-day training session on proper use of the TESI-C prior to this study. Interrater reliability, assessed by an independent review of 24 taped interviews by a second clinician, was found to be adequate (κ values ranging from 0.73 to 1.00 for various types of traumatic events). Children's categorical appraisal of the current trauma (either the accidental injury or the hospitalization) as meeting criterion A was used as one predictor. The parent of each child completed a parallel questionnaire, the Traumatic Events Screening Inventory for Parents (TESI-P) (Ford and Rogers, 1997). The TESI-P screens the same list of traumatic events and also determines whether any reported event meets criterion A for the child for ASD/PTSD (Ford and Rogers, 1997). For any prior traumatic event, a parent's *or* child's description of the child's subjective experiences as meeting criterion A led us to count that event as traumatic. Test-retest reliability for specific types of events using the combination of TESI-C and TESI-P ratings in a subgroup of 24 patients at outpatient follow-up 1 or more months later yielded good to fair agreement for several types of events (sexual abuse, $\kappa = 0.83$; family arguments, $\kappa = 0.69$; domestic violence, $\kappa = 0.56$; physical abuse, $\kappa = 0.51$; witnessing other's death or serious illness, $\kappa = 0.49$) and marginal to poor agreement for others (prior accident/medical procedures, $\kappa = 0.41$; verbal abuse, $\kappa = 0.40$; witnessing an accident, $\kappa = 0.25$; and experiencing a storm or natural disaster, $\kappa = -0.07$). We used an ordinal count of the various previous types of traumatic events to represent a summary predictor variable, types of prior traumatization, which had adequate test-retest reliability at the outpatient follow-up appointment ($n = 24$, Kendal τ-$B = 0.48$, $p < .0005$). Such a total count of prior event types meeting criterion A for ASD/PTSD was more predictive of suicidal ideations and behaviors than any single type of traumatic event in a large outpatient child psychiatry sample (Sanchez and Daviss, 1998). From the TESI-C and TESI-P accounts of the current accident, we derived an additional predictor, whether the patient had experienced a family member or friend's injury or death.

Prior Child Psychopathology. Parents completed the Child Behavior Checklist (CBCL) describing behavior over the 6 months prior to the injury and hospitalization (Achenbach, 1991a). The CBCL includes 118 symptoms that yield a dimensional score of total behavior problems, calculated as a Total Problems T score using the 1991 Data Entry and Scorer software (Achenbach, 1991b). The CBCL has well-documented validity and reliability (Achenbach, 1991a).

Injury Severity Scores. ISS, described above, were used as one predictor of ASDS. We also examined other injury-related factors gathered from medical record reviews, including whether the child had experienced a brain injury or lasting impairment or disfigurement (labeled as permanent injury).

Parents' Acute Distress. Parents completed a revised version of the Stanford Acute Stress Reaction Questionnaire (SASRQ-R) to measure the parental distress surrounding the child's injury and hospitalization. The original version of the SASRQ has shown excellent reliability and concurrent validity with other measures of adult PTSD (Koopman et al., 1994). Other versions have been used to assess acute stress reactions to various traumatic experiences (Classen et al., 1998). The SASRQ-R used here had 30 items and, after discussion with one of its authors, was modified by using 4 of the 6 original Likert-type response options while preserving their numerical values ("never" = 0, "occasionally" = 2, "often" = 4, and "very often" = 5). Higher total scores reflected higher parental distress (range of possible scores: 0–150). The internal consistency of the SASRQ-R in our sample was high ($\alpha = .93$).

Statistical Analyses

Data were analyzed using the SPSS 6.1 software (SPSS, 1994). Subjects were categorized as having ASD, partial ASD (a subsyndromal form, meeting criterion A and 3 of 4 of criteria B through E), or no ASD. Children's appraisal of the current trauma on the TESI-C was used to establish criterion A, and parent reports on the CSRC-P were used to establish symptoms for criteria B, C, D, and E, counting those rated as at least "somewhat true" as being present. The CSRC-P items were matched to *DSM-IV* criteria (by W.B.D.), with perfect interrater agreement for each of the 30 items ($\kappa = 1.0$) based on independent matching by another coauthor (R.R.). We did not feel a brief stay in a hospital would allow a reasonable assessment of functional impairment, so we excluded criterion F in classifying ASD status. Because of the small number of patients with the full syndrome of ASD, we combined ASD and partial ASD patients into a group we called *ASD symptomatic* and compared this with the remaining *ASD nonsymptomatic* group. For these group comparisons, Student t tests were used for continuous variables and χ^2 tests were used for categorical variables, at a significance level of $p < .05$, 2-tailed. Pearson bivariate correlations were used to examine relationships between parent and nurse observations of ASDS and our hypothesized predictors. For these analyses, we set the significance level at $p < .05$, 1-tailed, to increase our statistical power and in accordance with the directional nature of our hypotheses about associations between variables.

RESULTS

ASD Diagnosis and ASDS

Fifty subjects (92.6%) portrayed their current traumatic experiences as meeting criterion A for ASD/PTSD, in contrast to only 35 parents for their children (64.8%),

with poor agreement between parent and child appraisals of the current traumatic experiences ($\kappa = -0.03$, $p = .78$). Regarding dissociative or criterion B symptoms in their child, 35 parents (64.8%) reported their child as seeming dazed or confused, 31 (57.4%) reported amnesia for the some or all of the traumatic events, 19 parents (35.2%) reported emotional numbing or detachment, and 6 (11.1%) reported symptoms of derealization. Ten subjects (18.5%) met the full criterion B, having at least 3 different dissociative symptoms, while 22 (40.7%) had just 2 dissociative symptoms and 13 (24.1%) had just one dissociative symptom. Twenty-one subjects (38.9%) had one or more reexperiencing symptoms (criterion C), 19 (35.2%) had one or more avoidance symptoms (criterion D), and 39 (72.2%) had one or more hyperarousal/anxiety symptoms (criterion E). Four subjects (7.4%) who met criteria for ASD and 12 other subjects (22.2%) who met criteria for partial ASD were combined to form a group of 16 subjects (29.9%) classified as ASD symptomatic.

Prior Traumatization

The range of previous traumatic events meeting criterion A was 0 to 6 (median = 1, mode = 0). Thirty-six subjects (66.7%) or their parents reported they had been exposed to at least one previous traumatic experience serious enough to meet criterion A for ASD/PTSD. Fifteen subjects (27.8%) had experienced at least one type of abusive trauma including being threatened with or actually being physically abused (24.1%) or being sexually abused (7.4%). Thirty-three (61.1%) had experienced at least one type of nonabusive trauma, including witnessing threats of family violence (31.5%), having previous serious injuries (22.2%), witnessing accidents where others were injured (14.9%), experiencing significant disasters or storms (13.0%), witnessing incidences of family violence (9.3%), witnessing violence or violent threats in the community (3.8%), being kidnapped (3.8%), or witnessing a parent's suicide attempt by an overdose (1.9%).

Predicting ASD Symptomatic Status and ASDS

Table 1 shows a comparison of the ASD symptomatic and ASD nonsymptomatic groups as rated by parents. There were no differences by age or gender. Among predictor variables, prior psychopathology and parental distress were significantly higher and there was a higher rate of permanent injury in the ASD symptomatic group.

TABLE 1
Comparison of ASD Symptomatic Versus ASD Nonsymptomatic Groups

Variable	ASD Symptomatic (n = 16)	ASD Nonsymptomatic (n = 36)	Statistical Test
Age (years)	13.2 ± 3.2	13.8 ± 3.4	$t_{50} = 0.66$
Gender (% female)	31.3	33.3	$\chi^2_1 = 0.02$
ASD measures			
CSRC-P	16.8 ± 9.8	4.5 ± 3.9	$t_{50} = 4.86$***
CSRC-N	18.9 ± 10.1 (n = 15)	12.4 ± 12.7 (n = 35)	$t_{48} = 1.75$
Predictors			
Types of prior traumatic events meeting criterion A	1.8 ± 1.8	1.3 ± 1.3	$t_{50} = 1.22$
Prior psychopathology (CBCL Total Problems)	57.4 ± 13.3	49.9 ± 9.8	$t_{50} = 2.26$*
Injury Severity Score	15.7 ± 8.5 (n = 15)	12.1 ± 10.4	$t_{49} = 1.20$
Brain injury (%)	50.0	44.4	$\chi^2_1 = 0.14$
Permanent injury (%)	56.3	25.0	$\chi^2_1 = 4.78$*
Family/friend(s) injured or killed (%)	37.5	19.4	$\chi^2_1 = 1.93$
Current injury meeting criterion A per child (%)	93.8	92.1	$\chi^2_1 = 0.01$
Parent stress (SASRQ-R)	43.6 ± 26.8 (n = 15)	19.6 ± 17.1	$t_{49} = 3.22$**

Note: Values represent groups' means ± SD or percentages. Numbers in parentheses reflect reduced subject number in preceding row due to missing data. The ASD symptomatic group met criterion A (per child's report) and at least 3 of 4 of criteria B through E (per CSRC-P). ASD = acute stress disorder; CSRC-P = Child Stress Reaction Checklist-Parent version; CSRC-N = Child Stress Reaction Checklist Nurse version; CBCL = Child Behavior Checklist; SASRQ-R = Stanford Acute Stress Reaction Questionnaire-Revised.
* $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed).

Mean injury severity, rate of brain injury, and other predictors did not differentiate the groups.

Table 2 shows correlations between ASDS and various predictor variables. Children's current ASDS, as reported by parents, correlated highly with parental distress and parent ratings of children's prior psychopathology, and modestly with injury severity and family/friend(s) injured or killed. Nurses' ratings of children's ASDS correlated particularly strongly with injury severity, brain injury, and permanent injury, and modestly with family/friend(s) injured or killed. Parent and nurse ratings of children's ASDS did not correlate. Many of the predictor variables correlated significantly with each other. Parental distress was significantly intercorrelated with prior child traumatization and prior child psychopathology. Injury severity correlated with parental distress and with other injury-related and accident-related factors (e.g., brain injury, permanent injury, and family/friend(s) injured or killed).

DISCUSSION

There are several important preliminary findings from this study. ASD symptoms were widely if divergently observed in our patients during their hospitalizations for injuries. Though few subjects met full symptom criteria for ASD, almost a third of our subjects had at least subsyndromal (partial) ASD, with enough distress to meet criterion A and enough symptoms to meet at least 3 of the 4 other symptom criteria (criteria B through E). Our findings suggest that parents may underestimate their children's acute distress; children almost uniformly (92.6%) experienced the current experience as meeting criterion A, in contrast to only a slight majority of parents' ratings (64.8%) for their children. Relying on parent and nurse questionnaires to measure ASDS beyond criterion A, we may well have underestimated the actual rates of ASD and partial ASD. The strongest predictors of children's ASDS depended on who was rating it. Nurse-rated ASDS was consistently correlated with injury- and accident-related variables (including injury severity, permanent injury, brain injury, and family/friend injury or death). For parent ratings of ASDS, some of these same variables (injury severity and family/friend injury or death) were modest correlates, though more robust correlates were parent ratings of children's prior psychopathology and parents' acute distress, in particular.

The correlation between injury- or accident-related factors and both parent and nurse ratings of children's ASDS echoes previous empirical research that has linked trauma severity and posttraumatic symptoms (Foy et al., 1996). However, the precise nature of this association is unclear. There may be a direct medical link between injury severity and ASDS, since more serious injuries might be associated with more delirium symptoms or pain (Peterson, 1986; Suhr, 1986), either of which could be misperceived as ASDS. Though we excluded patients with overt delirium, 44% of our sample had experienced a brain injury, which might be associated with psychopathology similar to ASDS (Harvey and Bryant, 1998). Nurses, less familiar than parents with children's current or prior psychiatric

TABLE 2
Correlations of Acute Stress Measures and Predictors

	1	2	3	4	5	6	7	8	9
Child's Acute Stress									
1. CSRC-P (n = 52)	1.00								
2. CSRC-N (n = 51)	0.13	1.00							
Predictors									
3. Types of prior traumatic events meeting criterion A	0.15	0.08	1.00						
4. Prior psychopathology (CBCL Total Problems)	0.37**	0.16	0.36**	1.00					
5. Injury Severity Score (n = 53)	0.26*	0.50***	−0.14	0.03	1.00				
6. Brain injury	0.08	0.34**	0.10	0.18	0.34**	1.00			
7. Permanent injury	0.18	0.40**	0.12	0.14	0.28**	−0.06	1.00		
8. Current trauma meeting criterion A per child	0.15	0.10	0.03	0.06	0.13	−0.03	0.21	1.00	
9. Family/friend(s) injured or killed	0.27*	0.32*	−0.01	0.23*	0.27*	0.28*	0.15	0.16	1.00
10. Parent stress (SASRQ-R) (n = 53)	0.69***	0.12	0.31**	0.46***	0.26*	0.23	−0.03	0.16	0.16

Note: Numbers in columns are Pearson correlation coefficients for each pair of variables. N = 54 except for variables with missing data (n in parentheses). CSRC-P = Child Stress Reaction Checklist-Parent version; CSRC-N = Child Stress Reaction Checklist-Nurse version; CBCL = Child Behavior Checklist; SASRQ-R = Stanford Acute Stress Reaction Questionnaire-Revised.

* $p < .05$; ** $p < .01$; *** $p < .001$ (1-tailed).

symptoms, may have been especially influenced in their report of ASDS by patients' medical status or their knowledge of other losses associated with the accident.

Parental distress, previously linked with childhood PTSD (Foy et al., 1996), was the strongest correlate of injured children's ASDS, as rated by parents. Conceivably, acute parental distress may predispose these children to more ASDS. The link may also be bidirectional, inasmuch as children with more ASDS may cause a greater degree of acute distress in their parents. There are other possible explanations. A high level of chronic parental psychopathology, though not directly measured here, has previously been linked to children's subsequent posttraumatic symptoms (Foy et al., 1996) and may be indirectly reflected in parents' reports of their own acute distress. The high intercorrelation between parental distress and other predictors such as children's prior traumatization and prior psychopathology could represent a more chronic than acute relationship between parental and child psychopathology. This link could also reflect a measurement bias, in which more acutely (or chronically) distressed parents tend to report more prior psychopathology (McKelvey et al., 1999) or current psychopathology (as ASDS) in their children.

Similarly, the association between parental ratings of children's prior psychopathology and current ASDS echoes previous research linking children's prior psychopathology with degree of posttraumatic response (Boney-McCoy and Finkelhor, 1996; Earls et al., 1988), but it is also ambiguous. Injured children's previous psychopathology may elevate their risk of postinjury psychiatric morbidity, including ASDS. Previous psychopathology (especially externalizing symptoms) may increase children's risk of being injured in the first place. Current ASDS in injured children could also represent simply a continuation of prior internalizing and externalizing symptoms. Because of the cross-sectional nature of these data, we are unable to determine the causal direction(s) of such correlated variables. Further longitudinal research is thus needed to clarify these relationships between prior child psychopathology and current parental ratings of ASDS in children and in themselves.

A distinct feature of our study was the systematic appraisal of previous traumatic events, using both a child semistructured interview (the TESI-C) and a parent questionnaire (the TESI-P), to determine whether children met criterion A for ASD/PTSD. Prior traumatization was surprisingly common in this sample of pediatric patients, with 66.7% having experienced at least one previous event severe enough to meet criterion A for PTSD and 27.8% having experienced some type of abusive trauma. This could raise questions about the generalizability to other, noninjured populations of children. While not directly predictive of current ASDS in these children, breadth of prior traumatization, through its link with parents' acute distress and children's prior psychopathology, might exert some indirect effect on children's ASDS. Prior traumatization might also have a greater impact on long-term rather than acute posttraumatic symptoms. Specific types of prior traumatization may also be important predictors but could not be explored here given the small sample.

Limitations

Our findings need to be viewed as preliminary because of several limitations in this study. The lack of a control group and our study's cross-sectional design make it impossible to determine causality and what symptoms observed during the hospitalization actually stemmed from the injury and hospitalization or were simply chronic symptoms. The classification of children as having ASD or partial ASD was tenuous, because it did not consider criterion F and determined symptom criteria (other than criterion A) based only on parent questionnaires. Many of our measures had limited psychometric data, reflecting the preliminary status of research in this area. The lack of convergence between parent and nurse ratings of children's ASDS is particularly striking and may suggest problems with third-person measurements of childhood ASDS, since parents (Cantwell et al., 1997; Engel et al., 1994) and nurses may be less sensitive to children's internalizing symptoms. Because children almost uniformly considered the current trauma to meet criterion A for ASD/PTSD, perhaps an ordinal rather than a categorical measure reflecting a wider range of children's impressions about the current trauma would be more useful, as would a child-rated measure specifically designed to measure ASDS beyond criterion A. Sampling biases may also have been a limitation. One could speculate that the enrolled sample was a distinctly more vulnerable group, having higher rates of previous traumatization and reduced psychosocial resources to cope with the acute stressors on an outpatient basis. Findings in acutely injured pediatric inpatients thus may not generalize to other children who have experienced acute trauma. Finally, though the sample included a broader range of injuries than samples reported in previous studies of injured children

(DiGallo et al., 1997; Martini et al., 1990; Max et al., 1998; Rossman et al., 1997), our findings may not generalize to more urban or ethnically diverse populations of injured pediatric inpatients.

Clinical Implications

Despite these limitations, it is important to underscore that ASD symptoms were widely reported by parents and nurses in these children hospitalized for injuries. Assessments of traumatized children at multiple time points using multiple informants, and especially children's first-hand accounts of ASDS, may be critical in reliably identifying ASDS in this population and distinguishing it from medically based and other psychopathology. Our study suggests that if clinicians strictly adhere to the current *DSM-IV* criteria for ASD, especially with the high threshold for dissociative symptoms, they may overlook a large proportion of injured children who nevertheless experience substantial ASDS. Several significant predictors of ASDS in our sample were consistent with previously reported predictors of childhood PTSD, including parental distress, prior child psychopathology, and trauma severity (Foy et al., 1996). Parental distress, in particular, may provide not only a useful predictor of childhood ASDS but also an opportunity for clinical intervention in this seemingly vulnerable population of injured children and their families.

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