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Acute Stress Disorder and Posttraumatic Stress Disorder in Children and Adolescents Involved in Assaults or Motor Vehicle Accidents

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Objective: The authors investigated acute stress disorder and later posttraumatic stress disorder (PTSD) in children and adolescents who had been involved in assaults or motor vehicle accidents.

Method: They interviewed 93 patients 10–16 years old who were seen in an emergency department for having been assaulted or involved in a motor vehicle accident within 4 weeks after the assault or accident to assess acute stress disorder. At 6 months, they reinterviewed 64 (68.8%) of the patients to assess PTSD.

Results: At initial interview, 18 (19.4%) of the 93 patients had acute stress disorder and 23 (24.7%) met all acute stress disorder criteria except dissociation. At 6 months, eight of the 64 patients (12.5%) had PTSD. Acute stress disorder and PTSD did not differ in prevalence between patients who had been assaulted and those who had been in accidents. Sensitivity and specificity statistics and regression modeling revealed that the diagnosis of acute stress disorder was a good predictor of later PTSD but that dissociation did not play a significant role.

Conclusions: Acute stress disorder has merit as a predictor of later PTSD in children and adolescents, but dissociation has questionable utility.

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Psychological trauma occurs at high rates in children and adolescents (1), and posttraumatic stress disorder (PTSD) in this age group has attracted considerable clinical and research interest. However, the diagnosis of acute stress disorder, introduced in DSM-IV, has received relatively little attention in younger populations (2), despite a growing body of research in adults (3). Unlike PTSD, which is diagnosed at least 4 weeks after trauma, acute stress disorder is diagnosed 2 days to 4 weeks after trauma. Acute stress disorder also differs from PTSD in being explicitly conceived as a dissociative response to trauma requiring at least three of a possible five dissociation symptoms. An important public health marker of the utility of acute stress disorder is its ability to predict later PTSD, thus allowing clinicians to focus resources on susceptible individuals (4). In adults, acute stress disorder is a good predictor of later PTSD (5, 6), but the dissociation symptoms appear to add little (7).

Several studies have examined acute stress disorder symptoms in younger populations (8–12). However, only one study (11) examined the power of the acute stress disorder diagnosis (derived solely from questionnaire responses) to predict later PTSD. Results indicated that acute stress disorder had low predictive sensitivity (unlike in adults) but that this was improved by *removal* of the dissociation items. Further research on the predictive utility of acute stress disorder in younger samples is urgently needed.

To our knowledge, the present study is the first to assess acute stress disorder in children and adolescents using structured clinical interview. Participants were assessed 2–4 weeks and 6 months after physical assault or

motor vehicle accident. These events were selected because both are common, single-incident traumas with comparable rates of acute stress disorder in adults (5, 6). Our goal was to compare the utility of diagnoses of acute stress disorder, subacute stress disorder (acute stress disorder minus the dissociation criterion) (3), and "early PTSD" (PTSD without the duration criterion) (7) in predicting later PTSD.

Method

Children and adolescents (10–16 years old) who were treated in a London emergency department following motor vehicle accident or assault met study criteria (N=343). One hundred nineteen (34.7%) of these patients could not be contacted because of incomplete emergency department records, two (0.6%) were immediately referred for treatment, and 116 (33.8%) declined to participate. The 106 children and adolescents (30.9%) who consented to participate were assessed within 4 weeks. Of these, 93 (87.7%) completed an initial clinical interview and 64 (60.4%) completed a second interview at 6 months. The mean age of the 93 patients who completed the initial interview was 13.9 years (SD=1.9); 33 were girls.

There was no difference between participants and nonparticipants in terms of sex, type of trauma, injury severity, or ethnicity, although participants were significantly younger (nonparticipants' mean age=14.8, SD=1.9) ($t=1.98$, $df=364.1$, $p<0.05$). Participants reinterviewed at 6 months were no more or less likely than participants not reinterviewed to meet criteria for initial acute stress

disorder. After description of the study, written informed consent from both children and their caregivers was obtained for all participants.

The child version of the Anxiety Disorders Interview Schedule for DSM-IV (13) was used to diagnose acute stress disorder and PTSD. This instrument is a structured interview schedule with good psychometric properties (13, 14) for the assessment of anxiety disorders in young subjects. It does not include the dissociative symptoms of acute stress disorder. Therefore, we designed a number of supplementary interview items (available from R.M.-S.) to assess these symptoms, guided by DSM-IV and existing adult acute stress disorder interview schedules (15).

Subacute stress disorder was defined as the full acute stress disorder diagnosis minus the dissociation criterion. Early PTSD was defined as PTSD at initial assessment minus the duration criterion (7). Internal reliabilities for acute stress disorder, subacute stress disorder, and early PTSD diagnoses in the current study were high (Cronbach's alpha=0.85–0.87). There was unanimous diagnostic agreement between independent raters for 11 initial and 10 follow-up interviews (kappa=1.00).

Results

Table 1 shows how many children and adolescents met criteria for acute stress disorder, subacute stress disorder, and early and later PTSD. Chi-square analyses revealed no significant differences in prevalence for any diagnosis between those exposed to assaults and those involved in motor vehicle accidents.

Table 1 also shows the sensitivity, specificity, and positive and negative predictive power of the individual symptom criteria and the acute stress disorder, subacute stress disorder, and early PTSD diagnoses at initial interview to predict later PTSD, as well as the number of later PTSD cases that were correctly diagnosed by each criterion or diagnosis. Subacute stress disorder was the diagnosis that gave the best balance of sensitivity and specificity.

We used logistic regression to examine whether the acute stress disorder dissociation criterion explained any unique variance in later PTSD. Subacute stress disorder was entered in the first step, resulting in a significant model (χ^2=6.56, df=1, p<0.01) and accounting for unique variance (Wald χ^2==6.33, df=1, p<0.01). Entering the dissociation criterion in the second step did *not* significantly improve the model's ability to predict later PTSD and did not account for any unique variance.

Discussion

The rate of acute stress disorder in this group of children and adolescents (19.4%) is similar to that found in adults (5, 6) but slightly higher than in other child studies (8, 11). As in adult studies, acute stress disorder occurred at similar rates among subjects involved in assaults or motor vehicle accidents (5, 6).

The acute stress disorder diagnosis was a good predictor of later PTSD at follow-up, correctly classifying 82.8% of PTSD cases. However, subacute stress disorder provided a better balance between sensitivity and specificity at predicting later PTSD than full acute stress disorder. Furthermore, regression analysis revealed that the dissociation criterion did not significantly enhance the ability of

subacute stress disorder to predict later PTSD. As in the adult literature (7), acute stress disorder and early PTSD were equally effective predictors of later PTSD.

The study had two important limitations. First, the relatively small number of subjects may have weakened statistical power. Second, the study group comprised older children (essentially preadolescents) and adolescents. Studies examining acute stress disorder in larger and younger populations are therefore needed.

In conclusion, the acute stress disorder diagnosis is a good predictor of later PTSD in children and adolescents. However, our data indicate no unique role for the dissociation criterion of acute stress disorder in these patients.

References

1. Giaconia RM, Reinherz HZ, Silverman AB, Pakiz B, Frost AK, Cohen E: Traumas and posttraumatic stress disorder in a community population of older adolescents. J Am Acad Child Adolesc Psychiatry 1995; 34:1369–1380
2. March JS: Acute stress disorder in youth: a multivariate prediction model. Biol Psychiatry 2003; 53:809–816
3. Harvey AG, Bryant RA: Acute stress disorder: a synthesis and critique. Psychol Bull 2002; 128:886–902
4. Marshall RD, Spitzer R, Liebowitz MR: Review and critique of the new DSM-IV diagnosis of acute stress disorder. Am J Psychiatry 1999; 156:1677–1685

5. Brewin CR, Andrews B, Rose S, Kirk M: Acute stress disorder and posttraumatic stress disorder in victims of violent crime. Am J Psychiatry 1999; 156:360–366

6. Harvey AG, Bryant RA: The relationship between acute stress disorder and posttraumatic stress disorder: a prospective evaluation of motor vehicle accident survivors. J Consult Clin Psychol 1998; 66:507–512

7. Brewin CR, Andrews B, Rose S: Diagnostic overlap between acute stress disorder and PTSD in victims of violent crime. Am J Psychiatry 2003; 160:783–785

8. Bryant B, Mayou R, Wiggs L, Ehlers A, Stores G: Psychological consequences of road traffic accidents for children and their mothers. Psychol Med 2004; 34:335–346

9. Daviss WB, Racusin R, Fleischer A, Mooney D, Ford JD, McHugo GJ: Acute stress disorder symptomatology during hospitalization for pediatric injury. J Am Acad Child Adolesc Psychiatry 2000; 39:569–575

10. Fein JA, Kassam-Adams N, Vu T, Datner EM: Emergency department evaluation of acute stress disorder symptoms in violently injured youths. Ann Emerg Med 2001; 38:391–396

11. Kassam-Adams N, Winston FK: Predicting child PTSD: the relationship between acute stress disorder and PTSD in injured children. J Am Acad Child Adolesc Psychiatry 2004; 43:403–411

12. Winston FK, Kassam-Adams N, Vivarelli-O'Neill C, Ford JD, Newman E, Baxt C, Stafford P, Cnaan A: Acute stress disorder symptoms in

children and their parents after pediatric traffic injury. Pediatrics 2002; 109:e90

13. Silverman WK, Albano AM: Anxiety Disorder Interview Schedule for DSM-IV: Child and Parent Interview Schedule. San Antonio, Tex, Psychological Corp, 1996

14. Silverman WK, Saavedra LM, Pina AA: Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for DSM-IV: child and parent versions. J Am Acad Child Adolesc Psychiatry 2001; 40:937–944

15. Bryant RA, Harvey AG: Acute Stress Disorder: A Handbook of Theory, Assessment, and Treatment. Washington, DC, American Psychological Association, 2000

Table 1. Sensitivity, Specificity, and Positive and Negative Predictive Power of Acute Stress Disorder, Subacute Stress Disorder and Early PTSD Criteria and Diagnoses to Predict Later PTSD Among 93 Children and Adolescents Involved in Assaults or Motor Vehicle Accidents[a]

Criterion/Diagnosis	Frequency N	Frequency %	Sensitivity	Specificity	Positive Predictive Power	Negative Predictive Power	Cases Correctly Allocated (%)
Acute stress disorder criteria							
A. Traumatic stressor	67	72.0	1.00	0.32	0.17	1.00	40.6
B. Dissociation (at least three symptoms)	50	53.8	0.75	0.55	0.19	0.94	57.8
C. Reexperiencing (at least one symptom)	63	67.7	1.00	0.30	0.17	1.00	39.1
D. Avoidance (at least one symptom)	63	67.7	0.88	0.34	0.16	0.95	40.6
E. Arousal (at least one symptom)	75	80.6	1.00	0.23	0.16	1.00	32.8
F. Impairment	36	38.7	0.75	0.64	0.23	0.95	65.6
Acute stress disorder diagnosis (A + B + C + D + E + F)	18	19.4	0.50	0.88	0.36	0.92	82.8
Subacute stress disorder diagnosis (A + C + D + E + F)	23	24.7	0.63	0.82	0.33	0.94	79.7
Early PTSD criteria							
Reexperiencing (at least one symptom)	69	74.2	1.00	0.25	0.16	1.00	34.3
Avoidance (at least three symptoms)	49	52.7	0.50	0.45	0.11	0.86	45.3
Arousal (at least two symptoms)	60	64.5	0.88	0.38	0.17	0.95	43.8
Early PTSD diagnosis (early PTSD criteria + A + F)	23	24.7	0.63	0.79	0.29	0.94	76.6
PTSD diagnosis at 6 month assessment (N=64)	8	12.5					

[a]Sensitivity=the probability that someone diagnosed with PTSD at follow up had a given diagnosis etc. at initial interview; Specificity=the probability that someone not diagnosed with PTSD at follow up did not have a given diagnosis etc. at initial interview; positive predictive power=the probability that someone who has a given diagnosis, etc., goes on to have a diagnosis of PTSD at 6-month follow-up; and negative predictive power=the probability that someone who does not have a given diagnosis, etc., does not go on to have a diagnosis of PTSD at 6-month follow-up.