Acute stress disorder and posttraumatic stress disorder in children and adolescents involved in assaults and motor vehicle accidents

Richard Meiser-Stedman, PhD, William Yule, PhD, Patrick Smith, PhD, Ed Glucksman, FFAEM, Tim Dalgleish, PhD

Location of work and address for reprints:

Richard Meiser-Stedman

Department of Psychology, Institute of Psychiatry, De Crespigny Park, London, SE5 8AF, United Kingdom

Tel: +44 20 7848 0580

Fax: +44 20 7848 5006

e-mail: r.meiser-stedman@iop.kcl.ac.uk

Abstract

Objective: Acute Stress Disorder (ASD) and later Posttraumatic Stress Disorder (PTSD) were investigated in children and adolescents.

Method: Emergency department attendees (N=93) were interviewed within four weeks following assault or MVA to assess ASD. At 6 months 68.8% were re-interviewed to assess PTSD.

Results: At initial interview, 19.4% had ASD, while 24.7% met all ASD criteria except dissociation. At 6 months, 12.5% had PTSD. ASD and PTSD did not differ in prevalence between trauma populations. Sensitivity and specificity statistics and regression modeling revealed that, while ASD diagnosis was a good predictor of later PTSD, dissociation did not play a significant role.

Conclusions: ASD has merit as a predictor of later PTSD in children and adolescents, though dissociation has questionable utility.

Psychological trauma occurs at high rates in children and adolescents (1) and PTSD in this age group has attracted considerable clinical and research interest. However, the diagnosis of Acute Stress Disorder (ASD), 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 four weeks post-trauma, ASD is diagnosed two days to four weeks post-trauma. ASD 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 ASD is its ability to predict later PTSD, thus allowing clinicians to focus resources on susceptible individuals (4). In adults (5, 6) although ASD is a good predictor of later PTSD, the dissociation symptoms appear to add little (7).

Several studies have examined ASD symptomatology in younger populations (8-12). However, only one study (11) has examined the power of the ASD diagnosis (derived solely from questionnaire responses) to predict later PTSD. Results indicated that ASD 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 ASD in younger samples is urgently needed.

The present study is the first to assess ASD in youth using structured clinical interview. Participants were assessed 2-4 weeks and 6 months after physical assault or MVA. These events were selected as both are common, single-incident traumas, with comparable rates of ASD in adults (5, 6). The aim was to compare the utility of diagnoses of ASD, sub-ASD (ASD minus the

dissociation criterion)(3) and 'early PTSD' (PTSD without the duration criterion)(7), in predicting later PTSD.

Method

Child and adolescent (10-16 years) attendees (N=343) of a London ED following MVA or assault met study criteria. One-hundred and nineteen (34.7%) were not contactable due to incomplete ED records, 2 (0.6%) were immediately referred for treatment, and 116 (33.8%) declined to participate. The 106 (30.9%) who consented to participate were assessed within four weeks. Of these, 93 (27.1%) (33 females; mean age = 13.9 years, SD = 1.9) completed an initial clinical interview and 64 (68.8%) completed a second interview at 6 months. There was no difference between participants and non-participants in terms of sex, type of trauma, injury severity, or ethnicity, though participants were significantly younger (participants mean age = 14.8, SD = 1.9; non-participants mean age = 14.0, SD = 1.9; t=1.98, df=364,1, p<0.05). Participants re-interviewed at 6 months were no more or less likely than participants not re-interviewed to meet criteria for initial ASD. After description of the study, written informed consent from both children and their caregivers was obtained.

The Anxiety Disorders Interview Schedule for DSM-IV: Child Version (ADIS-C) (13) was used to diagnose ASD and PTSD. The ADIS-C is a structured interview schedule for the assessment of anxiety disorders in youth, with good psychometric properties (13, 14). The ADIS-C does not include the dissociative symptoms of ASD. A number of supplementary interview items (available from RMS) were therefore designed to assess these symptoms, guided by DSM-IV and existing adult ASD interview schedules (15).

Sub-ASD was defined as the full ASD diagnosis minus the dissociation criterion. Early PTSD was defined as PTSD at initial assessment minus the duration criterion (7). Internal reliabilities for ASD, sub-ASD, and early PTSD diagnoses in the current study were high (Cronbach's alphas = .85-.87). There was unanimous diagnostic agreement between independent raters for 11 initial and 10 follow-up interviews (Kappa = 1.00).

Results

Numbers meeting criteria for ASD, sub-ASD, and early and later PTSD are in Table 1. Chi-square analyses revealed no significant differences in prevalence for any diagnosis between participants exposed to assaults or MVAs.

Table 1 also shows the sensitivity, specificity, and positive and negative predictive power of the individual symptom criteria, and the ASD, sub-ASD, 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. Sub-ASD was the diagnosis that gave the best balance of sensitivity and specificity.

Logistic regression examined whether the ASD dissociation criterion explained any unique variance in later PTSD. Sub-ASD 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=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

ASD in the present sample occurred at a rate (19.4%) similar to that found in adults (5, 6), though slightly higher than in other child studies (8, 11). As in adult studies, ASD occurred at similar rates across assaults and MVAs (5, 6).

The ASD diagnosis was a good predictor of later PTSD at follow up, correctly classifying 82.8% of PTSD cases. However, sub-ASD provided a better balance between sensitivity and specificity at predicting later PTSD than full ASD. Furthermore, regression analysis revealed that the dissociation criterion did not significantly enhance the ability of sub-ASD to predict later PTSD. As in the adult literature (7), ASD and early PTSD were equally effective predictors of later PTSD.

The study had two important limitations. First, the relatively small sample size may have weakened statistical power. Second, the sample comprised older children (essentially pre-adolescents) and adolescents. Studies examining ASD in larger and younger populations are therefore needed.

In conclusion, the ASD diagnosis is a good predictor of later PTSD in children and adolescents. However, our data indicate no unique role for the dissociation criterion of ASD in this population.

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, TX, The Psychological Corporation, 1996

14. Silverman WK, Saavedra LM, Pina AA: (2001). 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, American Psychological Association, 2000

Table 1. Sensitivity, specificity, and positive and negative predictive power of ASD, 'sub-ASD' and 'early PTSD' criteria and diagnoses to predict later PTSD

Criterion/Diagnosis	Frequency		Sensitivity	Specificity	PPP	NPP	% cases correctly allocated
	N	%					
ASD criteria							
A. Traumatic stressor	67	72.0	1.00	0.32	0.17	1.00	40.6
B. Dissociation (at least 3 symptoms)	50	53.8	0.75	0.55	0.19	0.94	57.8
C. Reexperiencing (at least 1 symptom)	63	67.7	1.00	0.30	0.17	1.00	39.1
D. Avoidance (at least 1 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
ASD diagnosis (A + B + C + D + E + F)	18	19.4	0.50	0.88	0.36	0.92	82.8
'sub-ASD' 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 1 symptom)	69	74.2	1.00	0.25	0.16	1.00	34.3
Avoidance (at least 3 symptoms)	49	52.7	0.50	0.45	0.11	0.86	45.3
Arousal (at least 2 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)	8	12.5	-	-	-	-	-

Note. PPP=Positive predictive power. NPP = Negative Predictive Power.

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; PPP = the probability that someone who has a given diagnosis etc. goes on to have a diagnosis of PTSD at 6 month follow up; and NPP = 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.