SHORT REPORT

Is Acute Stress Disorder the optimal means to identify child and adolescent trauma survivors

at risk for later PTSD?

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Unstructured summary

One argument for the formulation of acute stress disorder (ASD) was the ability of the Dissociation criterion to predict later PTSD. Adult research suggests, however, that the Dissociation criterion has limited validity in this regard. The present study addressed this issue in child and adolescent survivors ($N = 367$) of road accidents from three centres (Oxford, London, Philadelphia). Dissociation accounted for no significant unique variance in later PTSD, over and above other ASD criteria. Furthermore, thresholds of either three or more reexperiencing symptoms, or six or more reexperiencing/hyperarousal symptoms, were as effective at predicting PTSD as the full ASD diagnosis.

In the immediate aftermath of trauma, an important clinical challenge involves identifying individuals who will later develop PTSD [1]. Diagnostic approaches to this problem have eschewed the application of the PTSD criteria themselves in the month post-trauma, citing concerns that PTSD represents a normative response in this acute phase [2]. Instead, the diagnosis of Acute Stress Disorder (ASD) has been proposed, which differs from PTSD in its requirement of 3 or more dissociative symptoms (e.g. derealisation) [3]. The rationale is that dissociation represents a *pathological* response in the acute phase, that can identify those at risk of later PTSD [2].

This diagnostic reliance on dissociation raises potential problems. First, individuals with significant PTSD symptomatology, but without dissociation, may receive less clinical priority than they merit in the acute phase. Secondly, patients find it relatively hard to report dissociative symptoms, thus increasing the clinical assessment burden [2]. These problems could doubtless be overcome if dissociation was indeed a robust index of acute psychopathology and risk for later PTSD. However, research suggests that dissociation actually accounts for little unique variance in predicting PTSD in adults [4-6], thus questioning the validity of ASD.

Research on ASD validity in children lags behind such work in adults, with only one study examining the core prediction that dissociation accounts for unique variance in later PTSD [7]. The results provided no support for such a relationship, thus casting doubt on the predictive validity of the Dissociation criterion in youth. However, this study involved a mixed-trauma sample, and the moderate sample size precluded trauma-specific analyses. Putative differences in the predictive validity of the Dissociation criterion across trauma types therefore suggest caution in interpreting this single finding.

Given the significant concerns about the dissociation mandate in adults, it is important to fully assess whether dissociation has predictive utility in trauma-exposed youth. The

primary aim of the present study was therefore to examine, for the first time to our knowledge, the predictive utility of the ASD Dissociation criterion in children and adolescents in a large sample, homogenous for type of trauma – in this case road traffic accidents (RTAs). To this end, we combined data from the 3 published studies in children and adolescents [7-9].

Driven by concerns about the predictive validity of ASD, adult research has examined whether simple counts of ASD/PTSD symptoms (other than dissociation) assessed in the acute aftermath of trauma can be as good at predicting later PTSD as the full ASD diagnosis [5]. If this was true for children and adolescents, it would have important implications for screening in the acute post-trauma phase where assessment of dissociation is even more problematic than it is in adults. As such analyses are only possible with large samples, our second aim was examine whether individual symptom counts across the different ASD/PTSD symptom criteria assessed in the month post-trauma can perform as well as full ASD in predicting later PTSD in children and adolescents.

Method

Data from hospital-attending, trauma-exposed child and adolescent RTA survivors (N=367; 117 female) aged 6-17 years (M=11.88; SD=2.60) were pooled from three centres: Oxford (n=86, aged 6–17 years) [8]; London (n=41, aged 10–16) [7]; and Philadelphia (n=240, aged 8-17) [9]. Written, informed consent was obtained from caregivers and assent from children. Of these 367, 285 were followed-up at 6 months (ns of 82, 29, and 174, respectively). Participant recruitment and flow details are presented elsewhere [7-9]. Diagnoses were based on widely-used instruments with robust psychometrics [10-14], as follows. ASD was assessed at 2-4 weeks (baseline) using either structured clinical interview (London), The Child Acute Stress Questionnaire [10] (Philadelphia), or a combination of

questionnaire and interview (Oxford). PTSD was assessed at 6 months using the Anxiety Disorders Interview Schedule [11], the Clinician Administered PTSD Scale for Children [12], or the PTSD Reaction Index [13, 14], respectively.

Results

At baseline 9% (n=33; 16 females) of the pooled sample met criteria for ASD, and 23% (n=83; 38 females) for 'sub-ASD' (ASD minus Dissociation), with 7% (n=25; 12 females) meeting criteria for PTSD at 6 months. Point-biserial correlations revealed no significant associations between age and presence of these diagnoses (Ps >.4). As initial analyses revealed no significant effects involving research centre (coded by dummy variables), Ps >.2, reported analyses utilised the pooled sample.

As expected, baseline presence of ASD correlated significantly with 6 month PTSD, Phi(283)=.18, P <.01. Stepwise logistic regression predicting 6 month PTSD, with sub-ASD on Step 1, and the ASD Dissociation criterion on Step 2, revealed sub-ASD as a significant predictor of PTSD, Wald=22.39, P <.001, whereas Dissociation provided no significant increment in PTSD prediction, Wald=.48, P >.48.

Table 1 shows the sensitivity, specificity, positive and negative predictive power, and percentage of patients correctly classified, of different baseline ASD/PTSD symptom counts in predicting PTSD at follow up. In adult violent crime victims, three or more baseline reexperiencing symptoms predicted later PTSD as effectively as did full ASD, in terms of the trade off between specificity and sensitivity [5]. Further research indicated that six or more symptoms of hyperarousal and/or reexperiencing in fact provided the best such trade-off in adults, compared to other algorithms [1]. It is clear from Table 1 that both of these thresholds were if anything somewhat better than the full ASD diagnosis, in their balance of sensitivity and specificity, for the present sample. Furthermore, adding full ASD (on step 2) to either of

these symptom counts on step 1 in logistic regressions [5], to predict later PTSD, provided no significant independent predictive benefits for ASD, Walds < .71, Ps > .4, over and above the predictive effects of either symptom threshold alone, Walds > 14.34, Ps < .001.

Discussion

These data are the first, to our knowledge, to show that the ASD Dissociation criterion appears to have no unique role in the prediction of later PTSD in a large sample of young trauma survivors, homogenous for trauma type. The significant association between ASD and later PTSD may therefore be unrelated to the presence of dissociative symptoms in children and adolescents, and may simply reflect persistence or chronicity in the symptom clusters that ASD and PTSD have in common. Indeed, sub-ASD (ASD minus dissociation) was almost three times more sensitive than full ASD in predicting PTSD (Table 1). These data thus cast doubt on the predictive validity of the current ASD diagnosis in younger samples.

The data also revealed that presence of three or more reexperiencing symptoms in the immediate aftermath of an RTA is as effective at predicting later PTSD as the full ASD diagnosis in youth, and possibly better. Indeed, the full diagnosis provided no significant increment in PTSD prediction over and above this simple threshold. Similar results were found for a count of six or more hyperarousal/reexperiencing symptoms – the algorithm used in the adult Trauma Screening Questionnaire [1]. However, sensitivities for both of these thresholds were less than 50%, suggesting that they are not an effective screen. Screening assessments may need to range beyond the scope of current diagnostic criteria and/or be carried out somewhat later post-trauma [15].

Although there were no significant effects of research centre for the reported analyses, it remains true that key limitations of the study are that diagnoses were derived differently across the three centres and the samples have different age ranges. Another limitation is the

focus on a single-incident civilian trauma. Dissociation may play a more significant

predictive role in other traumas experienced in youth such as abuse or natural disaster.

Table 1. Ability to predict PTSD at 6 months by varying ASD/PTSD symptom counts at 2-4 weeks.

Criterion and number of symptoms required for diagnosis	% correctly classified	Sensitivity	Specificity	Positive predictive power	Negative predictive power
ASD Dissociation					
At least one symptom	41	.85	.37	.12	.96
At least two symptoms	68	.50	.70	.14	.93
At least three symptoms*	80	.35	.84	.18	.93
At least four symptoms	86	.19	.93	.22	.92
At least five symptoms	89	.04	.98	.17	.91
ASD/PTSD Reexperiencing					
At least one symptom*	51	.85	.48	.14	.97
At least two symptoms	73	.73	.73	.22	.96
At least three symptoms	85	.42	.89	.28	.94
At least four symptoms	91	.15	.98	.50	.92
ASD/PTSD Avoidance					
At least one symptom*	48	.81	.44	.13	.96
At least two symptoms	72	.54	.74	.17	.94
ASD/PTSD Hyperarousal					
At least one symptom*	44	1.00	.38	.14	1.00
At least two symptoms	61	.77	.59	.16	.96
At least three symptoms	75	.73	.75	.23	.96
At least four symptoms	82	.38	.86	.22	.93
At least five symptoms	86	.19	.92	.20	.92
At least six symptoms	90	.15	.98	.44	.92
At least 6 Reexperiencing or Hyperarousal symptoms**	82	.48	.85	.24	.94
Sub-ASD	79	.68	.80	.25	.96
ASD full diagnosis	87	.24	.93	.26	.93

* Indicates the required number of symptoms for a DSM-IV diagnosis of ASD.
**Algorithm used in the Trauma Screening Questionnaire (1)

Sensitivity = probability that someone with PTSD at 6 months would have earlier endorsed at least those particular symptoms of ASD/PTSD. Specificity = probability that someone without later PTSD would not have endorsed at least those particular symptoms. Positive predictive power = probability that someone with those symptoms would later get PTSD. Negative predictive power = probability that someone without those symptoms would not go on to have PTSD.

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