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Brief report: Can irritability act as a marker of psychopathology?

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ABSTRACT

Irritability is ubiquitous in child and adolescent psychopathology. This study aimed to determine if the Affective Reactivity Index (ARI), a measure of irritability, could be used to screen for psychopathology in adolescents. The clinical sample comprised 31 adolescents with a DSM-IV diagnosis. The control sample was 31 gender and age matched adolescents recruited through schools. Both samples completed a test battery that included the Affective Reactivity Index. The clinical participants reported significantly higher levels of irritability than the control sample by both self- and parent-report. Using ROC analysis a cut off value of 4 on the self-report ARI was found to be optimal for indicating psychopathology; with a specificity of 77.4% and a sensitivity of 77.4%, the area under the curve was 0.86. This paper provides evidence to suggest that irritability may be used as a general predictor of psychopathology in adolescents.

Irritability is a symptom of a number of both internalising and externalising paediatric psychiatric disorders (APA, 2013) and is known to independently predict suicide risk (Pickles et al., 2010) and internalising disorders (Stringaris, Cohen, Pine, & Leibenluft, 2009; Stringaris & Goodman, 2009) even after controlling for baseline psychopathology.

The DSM-5 (APA, 2013) includes a new section of cross-cutting symptoms, along with recommended measures to assess those symptoms. The measures enable a clinician to assess if a person is experiencing a given symptom, regardless of whether their diagnosis includes it. The recommended measure to assess the cross-cutting symptom of irritability is the Affective Reactivity Index (Stringaris et al., 2012), a brief measure that has been found to be a reliable and valid measure of irritability in children and adolescents (Mulraney, Melvin, & Tonge, 2014; Stringaris et al., 2012).

Brief measures have been found to be very useful as screens for psychopathology. The K6 for example, a six item screen that contains questions about anxiety and depressive symptoms, was found to be a better predictor of serious mental illness (not just depression and anxiety) in adults than the Composite International Diagnostic Interview Short Form (CIDI-SF) (Kessler et al., 2003). As irritability is very common in psychopathology it is plausible that an irritability measure, such as the ARI, could screen for psychological disorders.

This paper has several aims; firstly to determine if a clinical sample reports higher levels of irritability than a healthy sample. Secondly to investigate if the ARI can screen for psychological disorders and to determine an optimal cut-off value

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against DSM-IV diagnosis. The final aim is to investigate if there are differential associations between irritability and internalising and externalising symptoms.

Method

Participants

Thirty one patients were recruited from an adolescent inpatient unit ($n = 25$), an outpatient unit ($n = 3$), and a private psychiatric practice ($n = 3$). Patients were invited to participate if they were considered well enough to complete the questionnaires by their treating clinician (i.e. had sufficient insight and reading and writing ability, and were not actively psychotic or intoxicated). Inpatient and outpatient participants were diagnosed by a multi-disciplinary team including a child psychiatrist and psychologist, private practice participants were diagnosed by an experienced child psychiatrist (BT) according to DSM-IV criteria. Sample characteristics can be found in Table 1. In the clinical sample 10 parents chose not to complete parent report measures resulting in 21 complete dyads.

The 31 control participants were selected from a previously described sample of 164 adolescents (Mulraney et al., 2014) recruited from local secondary schools and were matched to clinical participants on age and gender. All parents in the control sample completed the parent report measures.

Materials

The Affective Reactivity Index (ARI) is a six item questionnaire that assesses irritability over the past six months (Stringaris et al., 2012). Items are scored 0 = not true, 1 = somewhat true, and 2 = certainly true. The scale is reliable ($\alpha = 0.88–0.92$) and validity studies have found that scores on the scale discriminate between healthy children, children with bipolar disorder, and children with severe mood dysregulation (Stringaris et al., 2012).

The Cranky Thermometer (Gordon, Tonge, & Melvin, 2011) is a visual analogue scale that ask respondents to rate on a scale of 0–100, with 0 being not at all cranky/irritable/annoyed and 100 being very, very cranky/irritable/annoyed, their peak level of crankiness over the preceding two week period. The Cranky Thermometer has been found to have acceptable test-retest reliability (ICC = 0.64) and good validity, it is able to discriminate between individuals independently rated by a clinician as irritable, somewhat irritable, and not irritable (unpublished data).

The Strengths and Difficulties Questionnaire (SDQ) is a 25 item measure of psychological wellbeing. It contains five subscales two of which measure externalising problems (conduct problems and hyperactivity/inattention), and one of which measures internalising (emotional) problems. The scale has been found to have robust psychometric properties (Goodman, 2001) including in Australian adolescents (Hawes & Dadds, 2004).

Statistical analysis

All analyses were conducted separately by reporting source (i.e. parent-report versus self-report). The temper tantrum item was removed from the SDQ conduct problems subscale for the analyses with ARI total score as it is identical to an item on the ARI. To address the first aim, independent measures *t*-tests were conducted to compare mean scores between the clinical sample and community sample. A *t*-test was used to test for gender differences and Pearson's correlations explored any relationships between age and irritability.

To address the second aim a receiver operating characteristic (ROC) analysis was conducted (for both parent- and self-report) to determine the optimum ARI cut point to distinguish between those with and without a current diagnosis of a DSM-IV disorder. ROC analyses are graphical plots that illustrate the performance of a classifier, in this case, psychiatric diagnosis. A ROC curve plots the true positives (sensitivity) against the false positives (1-specificity). A classifier behaving

Table 1
Sample characteristics.

Sample characteristics	Clinical group	Control group
Female (n (%))	22 (70.97)	22 (70.97)
Age in years (mean (SD))	15.29 (1.32)	15.32 (1.33)
Primary diagnosis (n (%))		
Major depressive episode	20	
Borderline personality disorder	2	
Bipolar disorder	1	
Oppositional defiant disorder	2	
Adjustment disorder	1	
Conduct disorder	1	
Schizophrenia	1	
Asperger's disorder	2	
Number of comorbid conditions	1.73 (0.14)	