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Incidence, Clinical Correlates and Treatment Effect of Rage in Anxious Children

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Abstract

Episodic rage represents an important and underappreciated clinical feature in pediatric anxiety. This study examined the incidence and clinical correlates of rage in children with anxiety disorders. Change in rage during treatment for anxiety was also examined. Participants consisted of 107 children diagnosed with an anxiety disorder and their parents. Participants completed structured clinical interviews and questionnaire measures to assess rage, anxiety, functional impairment, family accommodation and caregiver strain, as well as the quality of the child's relationship with family and peers. Rage was a common feature amongst children with anxiety disorders. Rage was associated with a more severe clinical profile, including increased anxiety

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severity, functional impairment, family accommodation and caregiver strain, as well as poorer relationships with parents, siblings, extended family and peers. Rage was more common in children with separation anxiety, comorbid anxiety, attention deficit/hyperactivity disorder and behavioral disorders, but not depressive symptoms. Rage predicted higher levels of functional impairment, beyond the effect of anxiety severity. Rage severity reduced over treatment in line with changes in anxiety symptoms. Findings suggest that rage is a marker of greater psychopathology in anxious youth. Standard cognitive behavioral treatment for anxiety appears to reduce rage without adjunctive treatment.

Keywords

anxiety; pediatric; rage; anger attacks

1. Introduction

Rage episodes are not an uncommon clinical phenomenon in pediatric psychiatry populations (Budman et al., 2003; Storch et al., 2011; Storch et al., 2012a), however they are largely unexplored in empirical studies of pediatric anxiety. Rage is characterized by brief, explosive outbursts of anger that are disproportionate to the triggering stimuli (Budman et al., 2003; Budman et al., 2008; Carlson et al., 2009). This encompasses explosive anger outbursts that are threatening and poorly controlled such as hurtful verbalizations, destruction of property, physical threats or assaults, and dangerous behaviors towards self or others. There is initial evidence that rage may be a marker of greater psychopathology. The presence of rage is associated with higher levels of symptom severity and functional impairment in pediatric obsessive compulsive disorder (OCD; Storch et al., 2011; Storch et al., 2012a), although these findings have not been extended to other childhood anxiety disorders. Rage is a particularly notable, yet largely ignored, clinical feature seen in anxious youth given that it goes against their general harm avoidance stance. Distress is seen more commonly than anger outbursts in youth with anxiety disorders (Potegal et al., 2009b). Rage is often triggered in response to a feared situation or stimulus, and can be important to consider when planning and implementing treatment.

Common features of rage include physical or verbal aggression that initiates abruptly, appears impulsive, and is accompanied by a sense of loss of control (Fava and Rosenbaum, 1999; Budman et al., 2000). Although rage often occurs in response to frustration, rage is more severe and intense than typical 'tantrums', is inappropriate given the child's age and developmental stage (Budman et al., 2003), and is often one of the factors precipitating treatment-seeking (Carlson et al., 2009; Potegal et al., 2009a). Misdiagnosis can occur in the context of rage given the focus on superficial behavioral issues to the exclusion of underlying triggers. This mislabeling and misdiagnosis of rage can impact poor treatment decisions, delaying appropriate care and adding to overall disease burden and impairment. Inaccurate diagnosis of bipolar disorder has been documented in inpatient settings when children present with rage, and there is some evidence of poorer treatment outcomes and longer treatment duration in youth who present with rage (Campbell et al., 1992; Garland, 2001; Carlson et al., 2009; Potegal et al., 2009b; Stewart, 2012). Clearly, there is a need to

understand the presentation of rage in children with mental health concerns to better inform clinical decision making.

Rage, also referred to as explosive outbursts, have been documented in a number of disorders, including Tourette's disorder (Budman et al., 1998; Budman et al., 2000; Budman et al., 2003; Kano et al., 2008), OCD (Lebowitz et al., 2011; Storch et al., 2012a), and attention deficit hyperactivity disorder (ADHD; Carlson et al., 2009). One study found increased rage episodes in children with Tourette's disorder who presented with more comorbid disorders, especially comorbid OCD (Budman et al., 2000), although others have failed to replicate the effect of comorbidity on rage severity in Tourette's disorder (Kano et al., 2008). There does not appear to be any relationship between rage and specific tic type or severity (Budman et al., 2000). High incidence of rage (over 50%) have been observed in children with OCD, with increased rage amongst those with comorbid disruptive behavior disorders (Lebowitz et al., 2011; Storch et al., 2012a). Despite documentation in adolescent anxiety (Garland, 2001), there is little understanding of the incidence of rage in non-OCD childhood anxiety disorders. Given the existing evidence suggesting that rage is associated with a more severe clinical profile in a range of other disorders, and a poorer treatment prognosis for youth with bipolar disorder, it is important to improve our understanding about the presence, and clinical impact of rage in pediatric anxiety populations.

The putative mechanisms behind rage may vary between disorders and children. Rage has been documented in children with OCD as a result of their compulsive behaviors being disrupted (Storch et al., 2012a) and this may generalize to non-OCD anxiety disorders, where rage may be precipitated by some form of interference to the child's safety behaviors or avoidance efforts. Explosive rage may also occur as a result of other triggers. For example, anxious arousal resulting from actual or threatened exposure to feared stimuli may initiate an outburst in anxious children (Suveg and Zeman, 2004; Weems et al., 2005; Hannesdottir and Ollendick, 2007; Siess et al., 2014). Children who are anxious may be more emotionally reactive in general or may have less regulatory capacities as a result of chronic arousal (Hannesdottir and Ollendick, 2007; Siess et al., 2014), increasing the potential for rage in response to relatively minor triggers. Another possibility is that recurrent rage outbursts occur as a result of negative reinforcement from caregivers of externalizing or demanding behaviors. Rage may redirect parental attention towards inappropriate behavior or result in parental accommodation of the child's anxiety (Storch et al., 2012a). Rage has been associated with increased symptom severity and functional impairment in children with OCD as a result of increased levels of family and parental accommodation of OCD symptoms and rituals (Storch et al., 2012a). While families may be more likely to accommodate their child's anxiety symptoms to avoid triggering rage or to end a rage episode, this ultimately perpetuates worsening illness severity and functional disability. Despite the severity of behaviors and the association with family accommodation, there is little understanding about the relationship between rage and familial and peer relationships in existing research.

This study aimed to firstly examine the nature of rage in childhood anxiety disorders. The incidence and clinical correlates of rage were examined in a treatment-seeking sample of children with anxiety disorders, as well as the impact on relationship quality with family and

peers. We expected that increased rage would be associated with increased anxiety severity and functional impairment, as well as poorer relationship quality with family and peers. The second aim of this study was to examine whether reductions in anxiety symptoms during cognitive behavioral treatment resulted in reduced rage severity.

2. Methods

2.1. Participants

Participants included 107 children aged 7-13 years ($M = 9.82$; $SD = 1.83$) and their parents recruited during the screening phase of a treatment outcome study for childhood anxiety disorders at three community mental health centers located in North, Central, and South Florida (Storch et al., 2015). Participant demographic and diagnostic information is summarized in Table 1.

Participants were included in this report if they were diagnosed with a primary diagnoses of generalized anxiety disorder (41.1%), social phobia (25.2%), separation anxiety disorder (24.3%), specific phobia (8.4%) or Panic Disorder (.9%). Comorbidity was common and is summarized in Table 1. Participants were excluded based on criteria from the trial from which this sample was drawn: if they had a diagnosis of bipolar disorder, psychosis, or were actively suicidal. Participants were required to stabilize on psychotropic medications for eight weeks prior to study entry. Children were excluded if they started an antidepressant in the last 12 weeks or an antipsychotic in the last 6 weeks. At the time of study inclusion, 22.4% were currently taking psychotropic medications.

Change in rage symptoms over treatment was examined for 72 of these participants (Mean age = 9.68, $SD = 1.85$, 48.67% male) who completed a 12-session interactive computerized cognitive behavioral treatment ("Camp Cope-A-Lot"; Kendall and Khanna, 2008). The initial six sessions were self-guided sessions completed on the computer with therapist supervision that focus on skill acquisition. The other six sessions are therapist-led sessions focused on practicing graded exposure tasks.

2.2. Measures

Anxiety Disorders Interview Schedule – Parent and Child Versions (ADIS; Silverman and Albano, 1996)—The ADIS is the gold standard semi-structured clinical interview to assess anxiety and related disorders based on DSM-IV-TR criteria (American Psychiatric Association, 2000). Clinicians rate the presence of the disorder, as well as the severity of each disorder on a Clinician Severity Rating (CSR) scale (0-8) where scores 4 indicate full diagnostic presence. The interview was conducted separately with the parent and child, with clinicians making final diagnostic decisions based on both reports.

Pediatric Anxiety Rating Scale (PARS; The Research Units On Pediatric Psychopharmacology Anxiety Study Group., 2002)—The PARS is a clinician-rated measure of anxiety severity and symptom presence over the past week. The presence of fifty symptoms is assessed by clinician-interview with the parent and child separately on a yes/no scale, and severity in seven domains is assessed on a 0-5 scale with higher total scores indicating greater anxiety severity. Final clinician ratings are made based on the combined

reports. This measure demonstrates good internal reliability, test-retest reliability, convergent validity with other measures of anxiety severity, as well as sensitivity to treatment effects; however, divergent validity results are mixed (The Research Units On Pediatric Psychopharmacology Anxiety Study Group., 2002; Walkup et al., 2008; Storch et al., 2012q). The 6-item severity score (which excludes the symptom count item) was used in this study, consistent with other large-scale treatment trials (e.g., Walkup et al., 2008).

Rage Outbursts and Anger Rating Scale (RAORS; Budman et al., 2008)—The ROARS is a 3-item clinician-rated measure of rage that assesses rage frequency, intensity, and duration respectively over the past week. Items are rated on a 4-point scale (0 = *none/absent* to 3 = *> 1 rage outburst per day/severe*). Total scores range from 0-9 with scores 1-3 considered in the mild range, 4-6 in the moderate range, and 7-9 in the clinically severe range. This measure has demonstrated acceptable internal consistency and convergent validity in children with OCD, as well as good divergent validity from measures of disorder severity (Storch et al., 2012a).

Clinical Global Impressions of Rage (CGI-Rage; Guy, 1976)—The CGI-Rage is a single item clinician-rated measure of rage severity, scored on a 7-point scale (1 = *Normal – no outburst* to 7 = *Severe – at least daily explosive outbursts*). This measure has been used in previous studies of rage in children with OCD (Storch et al., 2012a) and Tourette's disorder (Budman et al., 2008).

Child Behavior Checklist (CBCL; Achenbach and Rescorla, 2001)—The CBCL is a widely used parent-report measure of their child's emotional and behavioral problems over the past six months. Parents complete 113 items about various aspects of their child's functioning on a 3-point likert scale (0 = *Not true* to 2 = *Very True/Often True*). The Internalizing Problems and Externalizing Problems subscales were used in the present analyses.

Columbia Impairment Scale (CIS; Bird et al., 1996)—The CIS is a 13-item measure of functional impairment in a number of domains, including family, school, and peer functioning. Items are rated on a 5-point scale (0 = *no problem* to 4 = *very bad problem*). This measure has shown good convergent validity with clinician-rated measures of impairment and psychological dysfunction (Bird et al., 1996).

Pediatric Accommodation Scale – Parent Report—The PAS-PR is a 10-item parent report measure of the frequency and impact of family accommodation their child's anxiety symptoms. Items assess the frequency of accommodation, as well as the impact on the parent and child as a result of these accommodations.

Caregiver Strain Scale (CGS; Brannan et al., 1997)—The CGS is a 21-item measure assessing the strain on families of children and adolescents with emotional and behavioral disorders on a 5-point scale (1 = *Not at all* to 5 = *very much*). This measure has a total score and two subscales measuring objective caregiver strain (e.g., missing work or neglecting duties, financial strain, disruption of family routines) and subjective caregiver strain (feelings internalized by the caregiver e.g., feeling sad or unhappy, worrying about the

child's future, feeling guilty). This measure demonstrates good convergent validity with other measure of family functioning and psychological wellbeing (Brannan et al., 1997).

Relationship Quality—Four items were rated by parents to assess the quality of the child's relationships with their parents, siblings, extended family and peers respectively. Parents responded on a 5-item scale ranging from *excellent* to *very poorly*. Higher scores represent better relationship quality.

2.3. Procedure

This study was approved by the relevant Institutional Review Board. Written consent was obtained from parents and assent from children. Clinical interviews were conducted with the parent and child separately by experienced assessors with specialist training in the assessment of anxiety disorders in children utilizing a webcam and secure internet platform. Assessors completed extensive training on the PARS and ADIS directed by the third author (A.B.L.) utilizing didactic training, observation, and in vivo supervision. All diagnostic decisions were made under the supervision of a licensed clinical psychologist. Questionnaire measures were completed independently by parents and children.

2.4. Data Analysis

The relationship between rage, anxiety severity, functional impairment, and family functioning was assessed using bivariate correlations. A hierarchical regression was used to examine whether rage predicted impairment at baseline over and above the effect of anxiety severity by entering age on the first step, anxiety severity on the second step, and rage severity on the third step. To identify the relationship between diagnostic presence and rage severity, participants were coded on each diagnosis as 1 = present and 0 = not present (descriptive information is provided in Table 1). T-tests were used to examine differences in rage severity within each diagnostic category, before entering all diagnostic categories into a regression equation simultaneously. Due to low frequency (see Table 1), Conduct Disorder and Oppositional Defiant Disorder were combined to reflect the presence of a behavior disorder, Dysthymia and Major Depression were combined to reflect the presence of a unipolar mood disorder, and Panic Disorder and Posttraumatic Stress Disorder were excluded. Rage severity was regressed on the eight diagnostic categories in a hierarchical regression. Given the association with rage severity, age was entered on the first step and diagnoses were entered on the second step. Missing data was excluded pairwise, although there were less than two cases with missing data in all analyses.

To evaluate if change in anxiety symptoms predicted change in rage symptoms, a 2-stage process was employed. First, residual gain scores were created for both the PARS and ROARS, and then the residual gain score from the ROARS was regressed on the residual gain score from the PARS. Simultaneous estimation of the residual gain scores as well as the regression involving residual gain scores was performed using path analysis in Mplus 7.31 (Muthén and Muthén, 2012) using full-information maximum likelihood estimation to account for missing post-treatment data (means for all observed variables were used in model estimation). Due to the nature of the trial from which this data was drawn (Storch et al., 2015), some participants described in the baseline data were initially randomized to a

treatment-as-usual (TAU) condition and could elect to complete CBT treatment at the end of the study. If TAU participants continued to meet inclusion criteria at the start of active treatment (see participants section above), their data was included for treatment analyses.

3. Results

3.1. Incidence

The incidence of rage in this sample is presented in Table 2, and the distribution of rage duration, severity and intensity over the past week has been reported in Table 3.

Rage episodes were experienced by 55.1% of the sample over the past week. These rage episodes were of moderate to severe intensity in 29.0% of cases and attacks lasted more than five minutes in 56.1% of cases. Overall, 37.8% of children scored in the moderate range for rage on the ROARS, and 11.2% scored in the clinically severe range. Slightly lower incidence were observed on the CGI-Rage, with 28.0% scoring in the moderate to severe range for rage severity.

3.2. Clinical correlates

Correlations and descriptive statistics for study variables are presented in Table 4.

Rage severity showed a moderate relationship with anxiety severity and a strong relationship with functional impairment. There was a strong relationship between rage and CBCL Externalizing symptoms and a weak relationship with CBCL Internalizing symptoms. Rage was associated with higher higher overall caregiver strain, as well as subjective and objective caregiver strain. Higher levels of rage were associated with having a poorer quality relationship with parents, siblings, extended family, and peers. Higher rage severity was associated with younger age, and as such, child age was entered as a covariate in subsequent analyses. Given the collinearity between the ROARS and CGI-Rage measures ($r = .89$), the ROARS was used as the primary rage measure for analyses given the incorporation of frequency, severity, and duration characteristics (compared to the one-item CGI-Rage). Nevertheless, results were consistent using the CGI-Rage.

We examined whether rage predicted pre-treatment impairment above and beyond the effect of anxiety using a hierarchical multiple regression with age entered on the first step, anxiety severity (PARS) entered on the second step, and rage entered on the second step (see Table 5). The first step containing age was not significant ($F(1,105) = 3.82, p = .053$), and the second and third steps were significant ($F(2,104) = 11.53, p < .001$ and $F(3,103) = 13.23, p < .001$ respectively). Although anxiety severity remained a significant predictor of impairment, rage predicted functional impairment above and beyond the effect of anxiety severity.

Comparisons between diagnostic categories on rage severity were conducted using t-tests and suggested higher rage severity on the ROARS in children with a separation anxiety disorder diagnosis ($t(105) = -2.39, p = .019$), OCD ($t(105) = -2.00, p = .049$), ODD diagnosis ($t(105) = -2.09, p = .039$), and ADHD diagnosis ($t(105) = -3.12, p = .002$) compared to children without these diagnoses. Considering all diagnoses together, the

overall model containing age and diagnostic categories was significant in predicting rage severity ($F(9,97) = 3.89, p < .001$). Having a diagnosis of OCD ($\beta = .18, t = 2.02, p = .046$), ADHD ($\beta = .21, t = 2.31, p = .023$) or a behavioral disorder (Conduct Disorder or Oppositional Defiant Disorder; $\beta = .22, t = 2.44, p = .016$) was associated with increased rage severity after accounting for the presence of other disorders.

3.3. Change in rage and anxiety severity over treatment

Rage declined during treatment for anxiety ($t(68) = 3.37, p = .001$). Change in rage was significantly associated with change in anxiety on the PARS ($\beta = .28, p = .022, R^2 = .08$).

4. Discussion

Although there is increasing awareness of rage in Tourette's disorder (Budman et al., 1998; Budman et al., 2000; Budman et al., 2003; Budman et al., 2008; Kano et al., 2008) and emerging evidence in OCD (Lebowitz et al., 2011; Stewart, 2012; Storch et al., 2012a), there is a paucity of studies in pediatric anxiety disorders. This study aimed to examine the incidence and clinical correlates of rage in children with anxiety disorders, as well as the impact on children's relationships with their family and peers. Rage was a common clinical phenomenon in children with anxiety, with more than half experiencing rage in the past week, and almost half experiencing moderate to severe rage problems. However, there was a notably lower proportion of children meeting the threshold for clinically significant and severe rages compared to previous studies in children with primary OCD (11.7% compared to 54.7% scoring 7 or higher on the ROARS; Storch et al., 2012a). Given the time consumed by OCD-related compulsive behaviors and rituals and the often overt nature of the behaviors, there may be more scope for disruption by external forces. Children may experience rage as a result of needing to repeat the behavior until it is 'just right'. Compared to OCD, other anxiety disorders (e.g., social, generalized, or separation anxiety) may encapsulate fears about the negative consequences of rages, increasing the drive to inhibit this behavioral response. This harm avoidance explanation is consistent with findings that suggest higher levels of distress in anxious children compared to anger (Potegal et al., 2009b). It may be that anxious youth have more episodes of dysregulated emotion, but these behaviors are not fully captured by indices of rage. Despite the lower incidence in comparison to OCD, there is evidence that rage is still a relevant clinical feature in child anxiety disorders.

Rage was associated with a number of clinical features, including higher internalizing and externalizing symptoms, family accommodation and caregiver strain, and poorer relationship quality with parents, siblings, extended family, and peers. Although previous studies in OCD have found that rage outbursts are most common at home in front of family members (Storch et al., 2012a) as opposed to peers, it is unclear whether the contextual features of rage in children with other anxiety disorders differ. It may be that rage occurs in the presence of peers in these children, impacting social functioning. Future studies should assess not only the presence of rage in anxious children, but also the locations, precipitators, and audience. We replicated previous findings suggesting increased functional impairment in children with increased levels of rage (Storch et al., 2012a), and noted that rage predicted functional impairment above and beyond the effect of anxiety. Similar to previous studies,

we did not find any relationship between child depressive symptoms and rage (Storch et al., 2012a). Overall, these results suggest that anxious youth who display rage have more severe clinical profiles and increased levels of dysfunction in most domains, consistent with the notion that rage is a marker of more severe psychopathology.

Rage has historically remained an underappreciated symptom in pediatric anxiety disorders. Anxious children who do not experience rages may look outwardly compliant to others or display more passive forms of avoidance. In comparison to these children, anxious children who also experience rage may display their anxiety symptoms in more externalized ways (e.g., intense verbal or physical refusals to approach or engage with fearful situations and stimuli) increasing the observable severity and obvious impact of their anxiety. These children are more likely to be experienced as difficult or challenging by parents and their extreme behaviors are likely to increase the level of functional impairment related to their psychopathology. Although we did not assess the causal mechanisms of rage, it is possible that early rage episodes may be a result of the “fight or flight” response when anxious children are exposed to fearful situations. The resulting rage reaction is negatively reinforced in families who increase their level of family accommodation of the child's anxiety symptoms, alleviating the acute distress but ultimately perpetuating and maintaining the child's anxiety (Storch et al., 2007; Merlo et al., 2009; Lebowitz et al., 2013).

Despite the increased level of symptomatology and impairment, rage decreased in accordance with reductions in anxiety symptoms during cognitive behavioral therapy. Although the measurement of rage and anxiety were taken concurrently, limiting a causal explanation, it is notable that rage reduced during a targeted anxiety treatment despite a lack of specificity or augmentation for rage symptoms. This finding is, again, consistent with the explanation that rage is a marker of increased psychopathology, and that treating the underlying disorder can result in improvements in other symptoms and overall functioning. However, it is also likely that skills learnt during CBT for anxiety would generalize to other non-anxiety problems, improving overall symptomatology. Regardless, our findings would suggest that rage is associated with more severe clinical presentations, but does reduce as the underlying anxiety is targeted during treatment, suggesting no need to augment standard anxiety treatment protocols.

The use of a sample recruited from community health settings, including those with a range of comorbid diagnoses is a strength of the current study, given this sample is likely to generalize to clients presenting in routine clinical care. However, current findings need to be interpreted in the context of methodological limitations. Firstly, given the literature on peer relationships, the subjective likert ratings of family and peer relationship quality are limited in nature and scope, and should be considered preliminary in nature. More robust measures of familial and social functioning would be warranted in future studies. There was evidence of increased rage in children with a diagnosis of separation anxiety, ADHD, ODD, and those with comorbid anxiety or behavioral disorders; however, further analyses within diagnostic subgroups was restricted by power. As future studies collect data on rage in pediatric anxiety, comparisons between different diagnostic categories may be informative. Thirdly, rage has been associated with diagnostic errors and poorer treatment prognosis in pediatric inpatient psychiatry settings (Campbell et al., 1992; Carlson et al., 2009; Potegal et al.,

2009b). As such, our analyses examining the relationship between rage and diagnostic presence may be limited by diagnostic overlap or error. Although we provide preliminary evidence to suggest that rage reduces in line with anxiety symptoms over treatment, this does not imply causality, and more evidence is needed to examine whether rage may moderate treatment outcome in outpatient anxiety treatment settings. The conceptualization of rage warrants more attention in future studies with consideration given to the precipitating factors and protective factors (e.g., audience, setting). Rage may occur as an externalized reaction to anxiety, or may occur independent of anxiety-provoking situations, with youth experiencing anxiety about the consequences of their actions or regret after the rage outburst. These qualitatively different experiences may have differential implications for treatment (i.e., standard treatment for anxiety that will likely reduce the triggers for rage, or targeted inhibitory/behavior management strategies).

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Highlights

- Incidence and clinical correlates of rage in anxious children was assessed
- Rage is common in children with anxiety disorders, especially in separation anxiety
- Rage was associated with poorer peer and family relationships quality
- Rage was associated with a more severe clinical profile
- Rage reduced over treatment in line with reductions in anxiety

Table 1
Sample Demographic Characteristics

	N	%
Female	50	44.6
Race		
Caucasian	89	83.2
African American	12	11.2
Asian	3	2.8
Other	3	2.8
Ethnicity		
Hispanic or Latino	13	12.1
Not Hispanic or Latino	94	87.9
Diagnostic Frequency ¹		
Generalized Anxiety	76	71.0
Social Anxiety	49	45.8
Specific Phobia	34	31.8
Separation Anxiety	44	41.1
Obsessive Compulsive Disorder	9	8.4
Posttraumatic Stress Disorder	3	2.8
Panic Disorder	1	.9
Attention Deficit Hyperactivity Disorder	47	43.9
Oppositional Defiant Disorder	12	11.2
Conduct Disorder	1	.9
Major Depression	6	5.6
Dysthymia	4	3.7
Psychiatric Comorbidity		
Anxiety Disorder	77	72.0
Unipolar Mood Disorder	9	8.4
Behavioral Disorder	13	12.1
ADHD	47	43.9

¹ All participant diagnoses were included (primary and comorbid)

Table 2**Rage Phenomenology**

	N	%
ROARS		
<i>Frequency (past week)</i>		
0	48	44.9
1-2	31	29.0
3-7	20	18.7
1 daily	8	7.5
<i>Intensity</i>		
Absent	47	43.9
Mild	29	27.1
Moderate	28	26.2
Severe	3	2.8
<i>Duration</i>		
None	47	43.9
5 minutes	18	16.8
6-15 minutes	15	14.0
16 minutes	27	25.2
<i>Total</i>		
None	47	43.9
Mild 1-3	8	7.5
Moderate 4-6	40	37.4
Severe 7-9	12	11.2
CGI-Rage		
Normal	42	39.3
Borderline	22	20.6
Mild	13	12.1
Moderate	15	14.0
Marked	11	10.3
Severe	4	3.7

Table 3
Distribution of rage duration, frequency and intensity over the past week in youth with anxiety

	Frequency					Intensity			
	<i>None</i>	<i>1-2 in past week</i>	<i>3-7 in past week</i>	<i>Every day</i>	<i>Absent</i>	<i>Mild</i>	<i>Moderate</i>	<i>Severe</i>	
Duration									
<i>None (5mins)</i>	47(43.9%)	0(0%)	1(9%)	0(0%)	47(43.9%)	0(0%)	0(0%)	0(0%)	0(0%)
<i>Mild (5mins)</i>	0(0%)	10(9.3%)	8(7.5%)	13(12.1%)	0(0%)	12(11.2%)	6(5.6%)	0(0%)	0(0%)
<i>Moderate (6-15mins)</i>	0(0%)	7(6.5%)	6(5.6%)	7(6.5%)	0(0%)	6(5.6%)	9(8.4%)	0(0%)	0(0%)
<i>Severe (15mins)</i>	0(0%)	1(9%)	0(0%)	7(6.5%)	0(0%)	11(10.3%)	13(12.1%)	3(2.8%)	3(2.8%)
Frequency									
<i>None</i>	-	-	-	-	47(43.9%)	0(0%)	1(9%)	0(0%)	0(0%)
<i>1-2 in past week</i>	-	-	-	-	0(0%)	18(16.8%)	12(11.2%)	1(9%)	1(9%)
<i>3-7 in past week</i>	-	-	-	-	0(0%)	9(8.4%)	10(9.3%)	1(9%)	1(9%)
<i>Every day</i>	-	-	-	-	0(0%)	2(1.9%)	5(4.7%)	1(9%)	1(9%)

Table 4
Correlation and Descriptive Statistics for Rage, Anxiety, Impairment and Family Functioning Variables

	ROARS	CGI-Rage	M	SD
ROARS Total	-	.89 ^{***}	2.97	2.88
Frequency	.90 ^{***}	.86 ^{***}	.89	.97
Intensity	.92 ^{***}	.88 ^{***}	.88	.90
Duration	.94 ^{***}	.75 ^{***}	1.21	1.25
CGI-Rage	.89 ^{***}	-	2.47	1.55
PARS	.30 ^{**}	.40 ^{***}	16.60	3.46
CBCL Internalizing	.23 [*]	.30 ^{**}	18.86	9.08
CBCL Externalizing	.60 ^{***}	.60 ^{***}	11.11	8.95
CIS-P	.45 ^{***}	.54 ^{***}	18.46	9.44
CDI	.01	.12	10.82	8.83
PAS-Total	.29 ^{**}	.37 ^{***}	15.21	7.56
Frequency	.24 [*]	.34 ^{***}	9.46	4.05
Parent Impact	.26 ^{**}	.29 ^{**}	2.15	1.71
Child Impact	.33 ^{**}	.38 ^{***}	3.59	2.48
CGS Total	.30 ^{**}	.31 ^{**}	47.88	15.83
Objective	.29 ^{**}	.31 ^{**}	22.64	8.21
Subjective	.28 ^{**}	.27 [*]	25.23	8.67
Relationship Quality				
Parents	-.32 ^{**}	-.35 ^{***}	2.99	.73
Sibling/s	-.29 ^{**}	-.32 ^{**}	2.41	.88
Extended Family	-.26 ^{**}	-.29 ^{**}	3.02	.75
Peers	-.21 [*]	-.36 ^{***}	2.62	.98
Age	-.34 ^{***}	-.36 ^{***}	9.82	1.83

Note. CBCL= Child Behavior Checklist; CGI-Rage = Clinical Global Impressions of Rage; CGS = Caregiver Strain Scale; CIS = Columbia Impairment Scale; PAS = Pediatric Accommodation Scale; ROARS = Rage Outburst and Anger Rating Scale.

*
p<.05,

**
p<.01,

p<.001

Table 5

Hierarchical regression summary table for predicting functional impairment.

	<i>B</i>	<i>SE</i>	β	<i>R</i> ²	<i>p</i>
Model 1				.04	.053
Age	-.97	.49	-.19		.053
Model 2				.15	<.001
Age	-.75	.46	-.15		.107
PARS	1.05	.24	.39		<.001
Model 3				.10	<.011
Age	-.20	.46	-.04		.667
PARS	.80	.24	.29		.001
ROARS	.13	.30	.34		<.001

PARS = Pediatric Anxiety Rating Scale, ROARS = Rage Outburst