Is emotional dysregulation a risk indicator for auto-aggression behaviors in adolescents with oppositional defiant disorder?

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ABSTRACT

Background: The Child Behavior Checklist Dysregulation Profile (CBCL-DP), **(high scores in Anxious/ Depressed, Attention Problems, and Aggressive Behavior subscales),** has been related to poor emotional and behavioral self-regulation in children and adolescents. Our aim is to evaluate if **it may be associated with auto-aggression** in youth with oppositional defiant disorder (ODD).
Method
In 72 **consecutively** referred youths with ODD, emotional dysregulation was assessed with the CBCL-DP, auto-aggression **and physical aggression against other persons with** the Modified Overt Aggression Scale.
Results: Regression analysis showed that greater higher CBCL-DP scores were associated to higher levels of auto-aggression, even when controlling for the levels of physical aggression against others and CBCL Total score.
Limitations: **The small sample size, the cross-sectional design, and the lack of a control group** limit the generalization of our findings.
Conclusions: Referred ODD youths with higher scores of CBCL-DP **are more likely to present** auto-aggression, besides aggression against others. The CBCL could improve the screening and detection of these **high-risk** patients.

1. Introduction

Children with severe dysregulation of emotions and behavior, including mood instability, severe irritability, aggression, temper outburst, and hyper-arousal have become a diagnostic challenge in the last two decades. These features do not completely fit any of the current diagnostic categories, including **Attention Deficit Hyperactivity Disorder** (ADHD), oppositional defiant disorder/conduct disorder (ODD/CD) or bipolar disorder, although they share features of all these domains. A possible dimensional measure of emotional and behavioral dysregulation is the Child Behavior Checklist (CBCL), one of the most used instruments for assessment of developmental psychopathology (Achenbach and Rescorla, 2001). **A specific CBCL profile, with high scores in three syndrome scales (Anxious/Depressed, Attention Problems, and Aggressive Behavior), has been correlated to poor self-regulation in children and adoles-**cents. **This profile** was firstly associated with the bipolar disorder, and named CBCL - Paediatric Bipolar Disorder profile (CBCL-PBD) (Biederman et al., 1995**), and** more recently labeled named CBCL - Dysregulation Profile (CBCL-DP) (Althoff, 2010). **This profile is related to maladaptive behaviors in response to frustration or negative emotions, impulsivity, elevated irritability and anger, and high rates of anxiety and disruptive behavior disorders (**Biederman et al., 2009**), suicidal behavior (Ayer et al., 2009), substance use disorders (**Holtmann et al., 2011**), relevant affective storms, reactive aggression, reduced need of sleep, and significant lower levels of school adjustment and occupational stability (**Hudziak et al., 2005; Volk and Todd, 2007**). Furthermore, it was associated with specific temperamental features, including high novelty seeking, high harm avoid-ance, low reward dependence, and low persistence in tasks, and personological traits as hostility, impulsivity, emotional**

lability, callousness and grandiosity (De Caluwè et al., 2013). Recent confirmatory analyses indicate that the best fitting model was a three factors bifactor model, with a general DP factor, and 3 specific factors representing each of the 3 single CBCL scales; criterion validity analyses showed that the DP factor was concurrently and longitudinally associated with markers of dysregulation (Geeraerts et al., 2015, Deutz et al., 2016). These authors suggest that CBCL-DP is best conceptualized as a broad syndrome of dysregulation with both internalizing and externalizing features, that exists in addition to the specific syndromes, and with independent associations with wide range of disorders (Holtmann et al., 2011). Clinically, the bifactor structure implies that the use of the subscales as independent sources of information should be discouraged; they may fall in a broader, more informative and clinically relevant, dysregulation syndrome that is better characterized in terms of spectrum of psychopathology (Deutz et al., 2016).

Our previous studies indicate that in children with ODD/CD, those with the CBCL-DP profile presented greater severity (higher scores in other CBCL scales) specific personological features (narcissism and impulsivity), and higher risk a mood disorder, appearing during adolescence (Masi et al., 2015a, 2015b).

A major issue in these patients is the proneness to impulsive aggressive behaviors, towards others as well as towards self. The CBCL-DP score was associated with **auto-aggressive behaviors** in community and **high-risk** samples (Deutz et al., 2016; Holtmann et al., 2011). Furthermore, a review indicated that self-harm behaviors are relatively frequent in ADHD and disruptive behavior disorders (Hawton et al., 2013). **This is in line with the notion that self-harm behaviors are closely related to enduring hostility, and that adolescents with self-harm behaviors may be more likely to react to a variety of situations with hostility, as the majority of them report a combination of anxiety and hostility just prior to self-injuring** (Ross and Heath, 2003). **In line with this, we hypothesized that, in adolescents with Oppositional Defiant Disorder (ODD), those highest in the CBCL-DP score more frequently may exhibit high levels of auto-aggression.**

2. Methods

We performed a cross-sectional analysis of data from a consecutive group of youths referred for affective and/or behavioral disorders that were assessed with a routine diagnostic procedure. After this assessment, 72 patients (65 males, aged 12–14 years, 90% Caucasian) fitted the following inclusion criteria: 1) a diagnosis of ODD according to the Schedule for Affective Disorders and Schizophrenia for School- Age Children- Present and Lifetime Version (K-SADS-PL), administered to both adolescents and one parent by trained child psychiatrists (mean rate of inter-rate agreement.81 Cohen's k) (Kaufman et al., 1997); 2) a Full Scale IQ greater than 85, assessed by trained clinical psychologists. None of the patient /and family declined the assessment and the inclusion in the sample. Fifteen patients (20.8%) had a comorbid ADHD, 8 (10.1%) a Mood Disorder (MD), and 5 (7%) an Anxiety Disorder. This sample was not used in previous studies from our group (Masi et al., 2015a, 2015b); no treatment was provided at the time of enrollment. Written consent was obtained from parents at the enrollment. The Ethical Committee of our Hospital approved the study.

The CBCL (Achenbach and Rescorla, 2001**) was completed by one parent (usually the mother). Based on the recent findings on the factor structure of the DP construct (with a general DP factor reflecting a broad dysregulation syndrome), we summed the t-scores (in order to normalize scores for gender and age) of the following CBCL subscales, Anxious/ Depression, Attention Problems and Aggressive behaviors,**

to create a linear variable named CBCL-DP (thus assessing the general DP factor). The reliability coefficients (Cronbach's alpha) of these subscales were .82, .81 and .82, respectively.

The auto-aggression was assessed with the Modified Overt Aggression Scale (MOAS) (Kay et al., 1988), a clinician administered scale that measures four types of overt aggression over the past week: verbal aggression, physical aggression against property, auto-aggression, and physical aggression against other people. **The scale was filled out with the patients during a clinical interview. In the current study, we used the auto-aggression and physical aggression (against other people) subscales. The reliability coefficients (Cronbach's alpha) of these subscales were 92, .91 respectively. Finally, as index of overall psychopathology, we calculated the CBCL-Total score.** In addition, demographics (age and gender) and ADHD and MD comorbidities (assessed with K-SADS-PL) were used as variables of interest in the analyses.

2.1. Data analysis

Pearson and point biserial correlations analyses were used to determine the associations between CBCL-DP score and both MOAS subscales as well as age, gender, MD, ADHD diagnosis and CBCL Total score. **Hierarchical regression model was used to examine the association between CBCL-DP score and MOAS auto-aggression. In this model, the dependent variable was MOAS auto-aggression, the independent variables were age, gender, comorbidity with ADHD and MD, and MOAS physical aggression against other people at step 1. Furthermore, in order to check the specificity of CBCL-DP score in predicting auto-aggression, we inserted at step 2 of the model the CBCL Total score; finally, the model was fitted with the CBCL-DP score.** All analyses were performed with SPSS software (version 15.0).

3. Results

Table 1 shows correlations among variables, **indicating a significant positive correlation among CBCL-DP score, MOAS scores, and ADHD comorbidity. Furthermore, a correlation between the two MOAS scales and between the MOAS aggression against others and age of the patients was also found.** In Table 2 regression analysis showed that children's higher DP score was associated to higher levels of auto-aggression, even after controlling for **age, gender, comorbidities,** physical aggression against others, and CBCL Total score. The **pooled effect of all the variables included in the second step of the regression accounted for 32% of the variance** of auto-aggression.

Table 1
Descriptive statistics and correlations among variables.

		Mean	Sd	1	2	3	4	5	6	7
1	DP	199.61	22.60	–						
2	CBCL-Total score	68.90	6.73	.32[*]	–					
3	MOAS auto-aggression	6.62	2.93	.31[*]	.13	–				
4	MOAS physical aggress.	17.42	6.26	.29[*]	.32[*]	.36[**]	–			
5	Age (months)	152.35	12.62	.23	.14	.25	.36[**]	–		
6	MD			.08	.03	.12	.12	.09	–	
7	ADHD			.32[*]	.28[*]	.14	.14	.05	.19	–

Legenda: Sd=Standard deviation; DP=CBCL Dysregulation Profile; MOAS= Modified Overt Aggression Scale; MD= Mood Disorders; ADHD= Attention Deficit Hyperactivity Disorder.
Note. ** significant at *p* < .01; * significant at *p* < .05.

Table 2
Hierarchical regression model. The dependent variable is MOAS-auto aggression.

		□	R Ch.
Step 1	Age	.03	
	Gender	.01	.08
	ADHD	.02	.18[**]
	MD	.02	
	MOAS physical aggression	.32[*]	
Step 2	CBCL Total score	.06	
Step 3	DP	.19[*]	
AR .32			

Legenda: DP = CBCL Dysregulation Profile; MOAS = Modified Overt Aggression Scale; MD = Mood Disorders; ADHD = Attention Deficit Hyperactivity Disorder.
Note: Ch = R change at step; □ = beta at step; AR= Adjusted R^2; ** significant at $p < .01$; * significant at $p < .05$.

4. Discussion

Children and adolescents with ODD and severe irritability/anger are at significant risk for internalizing disorders and other poor psychosocial outcomes (Mbekou et al., 2014; Stringaris and Goodman, 2009), as well as for self-harm ideation and behavior (Hawton et al., 2013).

Reflecting a poor ability to regulate affect (anxiety, depression), behavior (aggression), and cognition (impulsivity) (Deutz et al., 2016), the CBCL-DP has been associated to self-harm in community samples (Deutz et al., 2016; Holtmann et al., 2011). To our knowledge, **this is the first study exploring the role of emotional dysregulation in auto-aggressive behaviors of referred adolescents with ODD, assessed with CBCL-DP and MOAS.** The main result of our study is that referred ODD adolescents with higher scores on the CBCL-DP were **more likely to present** auto-aggression. **Controlling our model for the physical aggression against others and CBCL total score strengthens the findings, excluding the possibility that the association is an artifact of failure to control for another form of aggression and/or an overall psychopathology.**

Irritability, aggressiveness, labile mood with emotional hypersensitivity and affective temperamental dysregulation are all hallmarks and/or correlates of our patients, and these features may be mostly related to self-harm (Masi et al., 2015a; Hawton et al., 2013). In this naturalistic observation including a referred sample of patients, the CBCL-DP was a useful risk indicator for auto-aggression, besides aggression against others and comorbidities. This feature is unique and not covered by the CBCL total score, also supporting the theoretical conceptualization of a dysregulation syndrome (Geeraerts et al., 2015, Deutz et al., 2016), **with its own specific correlates and outcomes** (Masi et al., 2015b). **The CBCL-DP thus may reflect more than an overall index of psychopathology or comorbidity.**

The data emerged from our study have methodological implications for diagnostic practice, as the CBCL, which can be easily and quickly administered, could enhance the detection of **high-risk youth,** in addition to more explicit measures (i.e., interviews to patients and parents).

The sample size, a possible selection bias (patients gathered from a third level clinic), **and the lack of a control group** are limitations for the generalization of our findings. In addition, **being a cross-sectional analysis, it is not possible to know what goes first, as well as the specific relationship between aggressive behaviors and CBCL-DP scores. Furthermore, CBCL-DP score includes aggression, and therefore some analyses might have been testing simply concurrent validity. Finally, we did not use youth-reported measures for auto-aggression. Further research should address a comparison between self-rated and other-rated auto-aggression.** Further controlled research on the role of DP score on the natural course of early-onset ODD is warranted.

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