

Comorbidity of oppositional defiant disorder and anxiety disorders in preschoolers

Virginia Martín, Roser Granero and Lourdes Ezpeleta
Universitat Autònoma de Barcelona

Abstract

Background: The aim was to study the comorbidity of oppositional defiant disorder (ODD) and anxiety disorders (AD) among preschool children of the general population, and to assess the contribution of comorbidity to the child's functional impairment. **Method:** 622 children were assessed at the ages of 3 and 5, through a diagnostic interview. They were clustered into three diagnostic groups: only ODD, only AD and comorbid ODD+AD. **Results:** At age 3, ODD was associated with specific phobia, OR = 4.7, 95% CI [1.4, 14.1], and at age 5, with any anxiety disorder, OR=3.9; 95% CI [1.8, 8.4]. ODD at age 3 was predictive of separation anxiety at age 5, OR=4.1; 95% CI [1.2, 14.3]. Comorbid ODD+AD cases showed a higher risk of functional impairment at school and in behavior toward others. Sex and socioeconomic status were not related to the diagnostic group. **Conclusions:** ODD+AD comorbidity can be identified in preschool children. Early identification of this association is needed to adequately treat the affected children.

Keywords: Comorbidity, anxiety disorder, oppositional defiant disorder, preschool.

Resumen

Comorbilidad del trastorno negativista desafiante y los trastornos de ansiedad en preescolares. **Antecedentes:** se analiza la comorbilidad entre el trastorno negativista desafiante (TND) y los trastornos de ansiedad (TA) en preescolares de población general, y el deterioro funcional con que se asocian. **Método:** 622 niños fueron evaluados a los 3 y los 5 años con una entrevista diagnóstica. Se compararon 3 grupos diagnósticos: únicamente TND, únicamente TA y comorbilidad TND+TA. **Resultados:** a los 3 años se halló asociación entre TND y fobia específica (OR = 4.7, IC95%: 1.4÷14.1) y a los 5 años entre TND y TA, OR= 3.9; 95% IC [1.8, 8.4]. La presencia de TND a los 3 años fue predictiva de ansiedad de separación a los 5 años (OR = 4.1; IC95%: 1.2÷14.3). La comorbilidad se asoció con mayor deterioro funcional en la escuela y en el comportamiento hacia los demás. Sexo y nivel socioeconómico no se asociaron al grupo diagnóstico. **Conclusiones:** la comorbilidad TND+TA se puede identificar en edad preescolar. Es necesaria la detección temprana de estos trastornos para el adecuado tratamiento de los niños afectados.

Palabras clave: comorbilidad, trastorno de ansiedad, trastorno negativista desafiante, preescolar.

Oppositional defiant disorder (ODD) is characterized by negativistic, defiant, disobedient, and hostile behavior, particularly towards authority figures (American Psychiatric Association, 2000), which causes marked difficulties with parents, teachers and peers (Barkley, Benton, & Maughan, 2008). ODD is the most common disruptive disorder in childhood. In recent years, ODD has received a lot of interest because of the high level of comorbidity that it usually presents (Cunningham & Ollendick, 2010). ODD is also a potent precursor/mediator of other disorders, and its early detection is crucial for breaking the chain of complications (Burke, Loeber, Lahey, & Rathouz, 2005). The disorders most often associated with ODD include attention deficit/hyperactivity disorder (ADHD), conduct disorder, substance abuse, antisocial personality, depression and anxiety disorders (AD) (Boylan,

Vaillancourt, Boyle, & Szatmari, 2007; Stringaris & Goodman, 2009).

Despite the high frequency of comorbidity between ODD and AD (ODD+AD), its early onset and the increase in services use (Keenan & Wakschlag, 2004; Sterba, Egger, & Angold, 2007), most studies have focused on the child and adolescent stages. In school age samples of 6-9 year-olds, comorbid anxiety may strengthen the association of ODD and ADHD (especially the combined type). This makes comorbid anxiety a powerful risk factor for the development of externalizing problems (ODD or conduct disorder) (Humphreys, Aguirre, & Lee, 2012). In a clinical sample of children between 8 and 12 years, the symptoms of ODD "excessively arguing with adults" and "deliberately trying to annoy or upset others" were associated with the presence of anxiety symptoms (Polier, Vloet Herpertz-Dahlmann, Laurens, & Hodgins, 2012). Higher levels of anxiety and ODD (ages 6-18 years) are associated with symptoms of anger/irritability compared with those who did not show these symptoms (Drabick & Gadow, 2012). In a longitudinal study comprising ages 12 to 26 years, anxiety symptoms persisted into adulthood while negativistic symptoms tended to stabilize or decrease (Leadbeater, Thompson, & Gruppuso, 2012).

The association between ODD+AD has raised some controversy. Some studies suggest that anxiety may be an epiphenomenon of ADHD or depression and, therefore, in the absence of ADHD or depression, the ODD+AD relationship would not appear (Angold & Costello, 2001). Other studies found that ODD+AD associations were moderated by sex (comorbidity was present only in girls) (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003), but others did not find such interaction (Munkvold & Lundervold, 2011).

Although scarce, there are some empirical data on the ODD+AD association in preschoolers. In the general population, Wichstrøm et al. (2012) reported a 7.1% odd ratio (OR = 5.6) prevalence of ODD+AD comorbidity. Lavigne, LeBailly, Hopkins, Gouze and Binns (2009) found, at the age of four years, an OR of 3.44 for the association between ODD and separation anxiety disorder. Egger and Angold (2006), in 2 to 5 year-old preschool children, found associations between generalized anxiety/separation anxiety and ODD of OR = 4.4. Bufferd, Dougherty, Carlson, and Klein (2011) indicate that 9.2% of a sample of preschoolers (age 3) had two or more diagnoses, and one of the most significant comorbidities was ODD+AD (OR = 2.03). In addition, a study of posttraumatic stress disorder and comorbid disorders in 70 children (ages 3-6) in the wake of Hurricane Katrina revealed that 88.6% had at least one comorbid disorder, the most common being ODD and separation anxiety disorder (Scheeringa & Zeanaha, 2008). These results support the idea that ODD and AD coexist at a very early age.

Several explanations have been put forward for the comorbidity of ODD+AD. Lavigne et al. (2009) propose that either AD or depression are present in the preschool years but are masked by the symptoms of ODD, or that problems caused by ODD in academic performance or social functioning may subsequently lead to AD and depression. It has also been proposed that ODD is composed of different dimensions (irritable, headstrong, and hurtful) (Boylan et al., 2007; Burke & Loeber, 2010; Stringaris & Goodman, 2009) that may facilitate its association with various disorders. These dimensions have been identified in preschool children, and a significant relationship has been reported between irritability and AD (Ezpeleta, Granero, de la Osa, Penelo, & Doménech, 2012).

It is also possible that socioeconomic status is associated with ODD+AD comorbidity. Amone P'Olak et al. (2009) found that low SES creates a risk for internalizing (depression and anxiety) and externalizing (ODD, ADHD, conduct disorder) problems.

More empirical evidence is needed to help clarify the magnitude of the association between ODD+AD, and how it affects children's lives, in order to improve detection and intervention of these common problems. The aim of this study is to examine the presence of cross-sectional and longitudinal comorbidity ODD+AD in preschool children from the general population, assess the role of gender and socioeconomic status in this association and assess the association with functional impairment in the lives of children.

Method

Participants

The sample is part of a large research project into developmental trajectories for behavioral disorders in childhood. A two-phase design was employed (Ezpeleta, de la Osa, & Doménech, in press). A total of 2,283 families, obtained from the census of all 3-year-old children attending school in Barcelona ($N = 13,578$), were invited

to participate, with 1,341 accepting the invitation (participation ratio: 58.8%). Sixty-three children were excluded due to language issues or generalized developmental problems, and the remaining 1,278 were screened through the behavioral problems scale of the Strengths and Difficulties Questionnaire (parent version) for 3- to 4-year-olds (SDQ³⁻⁴; Goodman, 1997). All children with a positive screening score were invited to participate ($N = 522$ cases, 42.9%), as well as a random 30% of the $N = 756$ children with a negative screening score.

The final sample included 622 children (417 with a positive screening score and 205 negative). At 5 years old, 537 children were assessed again. Table 1 shows the descriptive statistics for participants.

Instruments

The Diagnostic Interview for Children and Adolescents for Parents of Preschool and Young Children (DICA-PPYC; Reich & Ezpeleta, 2009) is a semi-structured interview with good psychometric properties validated in the Spanish population (Ezpeleta, Osa, Granero, Doménech, & Reich, 2011). The DICA-PPYC assesses the most common mental disorders of children from 3 to 7 years old, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000). The anxiety disorders analyzed include separation anxiety, generalized anxiety, specific phobia and social phobia. The variable "other comorbidity" includes ADHD, conduct disorder, and major depression. The average administration time for the first DICA-PPYC was 49.8 minutes, and was 41.7 minutes for the second.

Table 1
Descriptive (N = 622)

	3 years-old		5 years-old	
Sex (male); <i>n</i> (%)	310	(49.8)		
Age (years-old); <i>mean</i> (<i>SD</i>)	2.97	(0.16)	5.23	(0.48)
SES; <i>n</i> (%)	High	205	(33.0)	
	Mean-high	195	(31.4)	
	Mean	88	(14.1)	
	Mean-Low	99	(15.9)	
	Low	35	(5.6)	
	3 years-old		5 years-old	
DSM-IV disorders	N	(%) ¹	N	(%) ¹
Disruptive behavioral disorders	87	(10.0)	67	(9.6)
Attention deficit hyperactivity dis.	33	(3.6)	30	(4.2)
Oppositional defiant disorder	61	(6.9)	46	(6.6)
Conduct disorder	10	(1.4)	5	(0.5)
Anxiety disorders	59	(7.7)	75	(11.7)
Separation anxiety	18	(2.1)	8	(1.3)
Generalized anxiety	1	(0.1)	5	(0.5)
Specific phobia	27	(3.6)	53	(8.3)
Social phobia	16	(1.9)	20	(3.6)
Major depression disorder	4	(0.4)	3	(0.3)

SD: standard deviation. SES: socioeconomic status (Hollingshead, 1975).

¹ Weighted prevalences

The Preschool and Early Childhood Functioning Assessment Scale (PECFAS; Hodges, 1999) assesses the functional impairment of children from 3 to 7 years old, as rated by a clinician following the DICA-PPYC (rating time of 10-15 minutes). It includes seven areas (school, home, community, behavior toward others, mood-emotions, mood-autolysis and cognition-communication) and each area includes several examples of impaired functioning. Each scale is scored based on four levels of impairment (0 = *no or minimal*; 10 = *mild or distress*; 20 = *moderate*, and 30 = *severe*). A total score (global measure of functional impairment) is defined as the sum of the scores on the seven individual scales (range: 0 to 210). The psychometric properties of the PECFAS are appropriate and have been described in Murphy et al. (1999).

Procedure

Approval was obtained from the Ethics Review Committee of the authors' institution. Head teachers of the participating schools were provided with a full description of the research, and their collaboration was also requested. Families were invited to participate and asked for their written consent. Interviewers trained to use the DICA-PPYC interviewed parents at the schools. The interview panel consisted of 10 members who completed an intensive 1-week training period consisting of learning the characteristics of the symptoms and disorders, methods of identifying these characteristics and how to code the symptoms. It included an overview of developmental psychology and the psychopathology of preschool children, as well as interviewing skills. Finally, interviewers completed the PECFAS based on the responses registered during the diagnostic interview.

Data analysis

Data analysis was carried out with SPSS20 for Windows, through the Complex Samples module (due the two-phase design), defining a planning project with weights equal to the inverse probability of selection in the second phase of the design. Cross-sectional ODD+AD comorbidity (at ages 3 and 5 years old) and longitudinal comorbidity (from 3 to 5 years old) were estimated with OR coefficients in binary logistic regressions adjusted for the presence of other disorders different to ODD and AD. This statistical procedure was also used to measure the specific discriminative capacity of each ODD symptom for identifying the presence of anxiety disorders, entering the list of ODD symptoms simultaneously in the same block (ENTER method).

The association between the number of symptoms for ODD and AD was estimated with Pearson's correlation, considering $|r| \geq 0.30$ to be a good effect size (Cohen, 1988).

For the study of the relationship between the diagnostic profile, sex, socioeconomic level (SES) and impairment, participants were divided into three groups. One group included children diagnosed with ODD but without AD ($N = 44$ at 3 years old, 35.7% male); another group was comprised children with AD but without ODD ($N = 42$; 45.2% male) and the third group included comorbid ODD+AD children ($N = 17$; 19.0% male). At 5 years old, the group sizes were, respectively: ODD = 31 children, AD = 60 and ODD+AD = 15. The association between sex and SES with the diagnostic profile was analyzed using multinomial regression models, with children's sex and SES entered as predictors, the group as criterion and the covariate being other comorbidities different to ODD and AD. The

association between functional impairment (defined as a binary outcome: 0 = *not-impaired* vs. 1 = *mild to high*) and the diagnostic group were studied cross-sectionally and longitudinally through binary logistic regression, adjusted for other comorbidities. For the PECFAS-total score (measure of global impairment) a General Linear Model (GLM) was defined.

Results

Comorbidity between ODD and anxiety

Table 2 shows the cross-sectional and longitudinal ODD+AD association. At the age of 3, ODD was associated with the group of anxieties and with specific phobia; at the age of 5, ODD was related with the group of anxieties. At the age of 3 ODD was a statistical predictor of separation anxiety at the age of 5.

Association between ODD symptoms and the presence of anxiety disorders

The logistic regressions analyzing the association of the ODD-symptoms list and anxiety disorders, adjusted for other comorbidity, showed that at the age of 3 the symptom "touchy or easily annoyed by others" was cross-sectionally related to the group of anxieties, OR = 3.14, 95% CI [1.4, 6.9]. At the age of 5, the symptom "actively defies to comply with adults' requests or rules" was also cross-sectionally related with the group of anxieties and with social phobia, OR = 6.36, 95% CI [1.8, 22.2], and the symptom "blames others" was negatively related to the group of anxieties, OR = 0.39, 95% CI [0.16, 0.94], and with specific phobia, OR = 0.35, 95% CI [0.14, 0.89]. Longitudinally, the presence of the symptom "touchy or easily annoyed by others" at age 3 was associated at age 5 with the group of anxieties, OR = 2.16, 95% CI [1.1, 4.1], and social phobia, OR = 2.98, 95% CI [1.2, 7.4].

No statistical association was found between the number of ODD symptoms and the number of anxiety symptoms ($r < .10$ at 3 years-old and $r < .13$ at 5 years-old).

Association between sex, socioeconomic status and the diagnostic group

No statistical association emerged for the relationship between sex and diagnostic group ($p = .717$ and $p = .956$ at 3 and 5 years old, respectively) and SES and diagnostic group ($p = .395$ and $p = .521$).

Table 2
Comorbidity between oppositional defiant disorder and anxiety

	ODD and AD at 3 (N = 622) OR (IC95%)	ODD and AD at 5 (N = 573) OR (IC95%)	ODD at 3 and AD at 5 (N = 573) OR (IC95%)
Anxiety disorders	5.88* (2.76;12.6)	3.89* (1.79;8.42)	2.04 (0.90;4.64)
Separation anxiety	2.63 (0.68;10.1)	1.46 (0.21;10.2)	4.12* (1.18;14.3)
Generalized anxiety	–	2.64 (0.19;37.1)	–
Specific phobia	4.72* (1.43;14.1)	1.31 (0.52;3.31)	1.34 (0.43;4.15)
Social phobia	0.76 (0.13;4.59)	2.99 (0.74;12.0)	1.90 (0.44;8.18)

ODD: oppositional defiant disorder. AD: anxiety disorders.
– Not-estimable (low prevalence). *Significant OR (.05 level).

Association between diagnostic group and impairment

Table 3 shows the logistic regressions and the GLM that analyzed the cross-sectional and longitudinal association between diagnostic group and impairment at the age of 3 and 5 (results adjusted for the covariate “other comorbidity”). Cross-sectionally, ODD+AD comorbidity at age 3 was associated with a higher risk of impairment in behavior toward others, compared with those with only the presence of AD. Children with AD showed higher risk of impairment in mood-emotions compared with children with ODD. Regarding the PECFAS-total score, children with AD showed between 4.1 and 21.2 points less than comorbid ODD+AD children ($p = .004$) and between 1.4 and 17.4 points less than children with ODD ($p = .022$). The results of the cross-sectional analysis for children at 5 years old showed that the presence of ODD+AD comorbidity was predictive of a higher risk of impairment in behavior toward others compared with children with ODD and with those with AD. Children diagnosed with ODD+AD had a higher risk of impairment in mood-emotions than children with ODD, as did children with AD compared with children with ODD. Children with ODD obtained a PECFAS-total score of between 0.3 and 22.7 points lower than comorbid ODD+AD children ($p = .045$); children with AD achieved between 13.1 and 32.6 points lower than comorbid children ($p < .001$) and between 3.9 and 18.9 points lower than children with ODD ($p = .003$).

The results of the longitudinal analyses showed that ODD+AD comorbid children showed a risk of impairment at school 4.2 times higher than children diagnosed with AD. Children with ODD showed a risk of impairment at home 9.4 times higher than children with AD. In the mood-emotions domain, children with AD were at higher risk of impairment than children with ODD.

Discussion

We have identified concurrent and longitudinal ODD+AD comorbidity in preschoolers. No significant association was found between the diagnostic group (only ODD, only AD or both) and sex or socioeconomic status. ODD-specific symptoms have been

associated with anxiety. ODD+AD comorbidity in preschool at the age of 3 and 5 is associated with greater functional impairment in relationships with others and in school. The relationship between internalizing and externalizing disorders is a subject of great clinical interest because of the difficulties posed for explaining this association (Krueger, McGue, & Iacono, 2001; Eisenberg et al., 2001; Lilienfeld, 2003). Our results indicate that in preschool children an association can be identified between ODD and AD and that this association is maintained from 3 to 5 years of age. ODD has been described as a multidimensional disorder including irritability (or negative affect), oppositional behavior and aggressive behavior (Stringaris & Goodman, 2009; Burke & Loeber, 2010). This multidimensionality may help to explain the association between ODD and anxiety disorders. Specifically, the irritability/negative affect dimension is associated with ODD and predicts emotional disorders (Boylan et al., 2007). In this sense, the symptom “touchy or easily annoyed by others”, part of the “Irritable” or “Negative Affect” dimension of ODD (Ezpeleta et al., 2012), is one of those most closely associated with anxiety. Stringaris (2011) indicates that irritability is a state of mind characterized by anger and the ease with which upset is shown, and that it may be differentially related to various disorders. In particular, this author reports an association with anxiety. The relationship of the symptom “touchy or easily annoyed by others” with anxiety disorders, especially social phobia, suggests that high touchiness is a maladaptive characteristic that can lead to anxiety problems. Touchiness can lead to preschoolers being insecure and afraid of rejection, identifying the behaviors of others as an attack and overreacting (even to the extent of defying adults, another symptom associated with social phobia). Furthermore, AD is negatively associated with the symptom “blames others for their mistakes”, which may be due, more exactly, to the fact that anxiety is related with internal attributional style errors.

As was the case with Munkvold and Lundervold (2011), no association was found between sex and ODD+AD comorbidity. Although other studies indicate that girls have a higher risk of comorbidity, this relationship was obtained in older samples (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004).

Table 3
Association between the diagnostic group and impairment

	ODD and AD at 3 years-old (N = 103)				ODD and AD at 5 years-old (N = 106)				ODD at 3 years-old and impairment at 5 years-old (N = 93)													
	Prevalences		Factor		OR		Prevalences		Factor		OR		Prevalences		Factor		OR					
	ODD (N=44)	AD (N=42)	COM (N=17)	Group p	ODD vs COM	AD vs COM	ODD vs AD	ODD (N=31)	AD (N=60)	COM (N=15)	Group p	ODD vs COM	AD vs COM	ODD vs AD	ODD (N=41)	AD (N=38)	COM (N=14)	Group p	ODD vs COM	AD vs COM	ODD vs AD	
PECFAS																						
School, %	50.1	31.5	28.7	.229	2.65	1.29	2.18	46.6	18.5	47.6	.142	1.26	0.41	3.01	32.0	14.9	43.9	.079	0.61	0.24*	2.65	
Home, %	100	51.0	100	-				90.75	45.6	100	-				73.9	24.2	43.9	.001	4.17	0.45	9.36*	
Community, %	0	1.77	0	-				11.6	0.00	15.9	-				2.14	3.73	6.27	.755	0.33	0.60	0.55	
Behavior toward others, %	58.0	40.5	80.9	.048	0.32	0.17*	1.92	60.5	41.2	94.7	.021	0.09*	0.05*	2.00	40.5	27.8	31.4	.594	1.63	0.97	1.67	
Mood/Emotions, %	38.0	65.0	62.0	.039	0.36	1.29	0.28*	34.9	71.6	89.4	.002	0.06*	0.29	0.22*	31.9	61.1	37.6	.066	0.79	2.72	0.29*	
Mood/Autolysis, %	2.01	1.77	14.1	.276	0.12	0.11	1.15	2.34	1.10	10.6	.223	0.27	0.22	1.21	0	1.87	0	-				
Cognition, %	2.01	7.07	4.79	-				0.00	7.62	5.29	-				0	3.73	18.8	-				
¹ PECFAS: total-score; mean	37.4	26.6	41.0	.016	-3.21	-12.6*	9.41*	33.7	20.6	46.9	<.001	-11.5*	-22.9*	11.4*	22.8	16.0	26.3	.141	-2.92	-8.71	5.79	

ODD: oppositional defiant disorder. AD: anxiety disorders. COM: comorbidity ODD+AD.*Significant comparison (.05 level). ¹GLM for mean comparisons

Socioeconomic status was not associated with ODD+AD comorbidity. Regarding the relationship between the diagnostic subtype and the presence of functional impairment, our results suggest that ODD+AD comorbidity implies the highest level of global impairment for children, followed by ODD, and then AD. This result is in line with those found by Cunningham and Ollendick (2010) and Lavigne et al. (2009). In our study, the presence of ODD is also associated with an increased risk of impairment at home (compared to AD), which could be explained by the greater level of disobedience that is characteristic of children with ODD (who are more confrontational and argue more than children with AD), behavior that is especially relevant in the home and with principal carers. The presence of AD appears to be predictive of increased risk only on the mood / emotions scale of PECFAS, which could be because this scale measures more aspects of emotional psychopathology than functional impairment.

It should be recognized that this study has the limitation that the analysis is based solely on parent reports. However, it should also be noted that at very early ages, ODD shows most strongly in the home, which means that parents are often the first to perceive the problems caused by this disorder, making them good informants. In addition, despite the availability of a large sample of the general population, the size of the groups with ODD, AD

and both is relatively small, and this affects the statistical capacity for establishing meaningful relationships. However, despite this lack of power, the significant relationships which have emerged have important practical implications. Finally, the percentage of refusals during the sampling was higher for families of low socioeconomic status, and this must be taken into account when making generalizations.

The results of the study have several practical implications, including those oriented to the area of prevention: the association observed between ODD and AD in preschool should be considered an important risk factor for the presence of impairment in the global functioning of the children, and warns of the need for early identification of diagnostic conditions, risk factors and transverse and longitudinal ODD+AD comorbidity patterns.

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