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Research Article

Correlation between Limited Prosocial Emotions and Empathy in Adolescents Clinical Population

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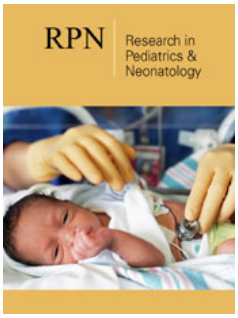

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Abstract

The present study aims to determine the correlation between Limited Prosocial Emotions (LPE) specifier for disruptive behavior disorders and the cognitive and affective subtypes of Empathy in a clinical population of adolescents in Mexico City. Sample was integrated with 49 participants between 13 and 18 years old from the Clínica de Adolescentes, an outpatient service of the Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz. All adolescents included, received LPE specifier diagnosed by certified psychiatrist using a categorical and dimensional instrument. The Global Empathy Scale parent/tutor and self-report versions were used to evaluate cognitive and affective empathy subtypes. The results showed an inversely correlation ($r=-0.54$, $p<0.05$) between the severity of LPE specifier dimensional evaluation and the global empathy in male and female population. Male population showed lowest affective than cognitive empathy functioning, particularly with the LPE specifier categorical instrument ($X2=5.78$, $p<0.05$). This research demonstrated that male and female adolescent population with LPE specifier presented an altered global empathetic functioning. Categorical and dimensional of LPE specifier establishment may be complementary in adolescent clinical population.

Keywords: Limited prosocial emotions; Dimensional categorical diagnosis; Cognitive empathy; Affective empathy

Abbreviations: LPE: Limited Prosocial Emotions, KSADS-PL 5.1: Kiddie Schedule for Affective Disorders and Schizophrenia Present and Lifetime Version 5.1, ICU: Inventory of Callous Unemotional, GES: Global Empathy Scale, CD: Conduct Disorder, ODD: Oppositional Defiant Disorder

Introduction

The Limited Prosocial Emotions (LPE) specifier, previously known as callous unemotional traits, refers to a severe and stable pattern of aggressive behavior in children and adolescents with disruptive behavioral disorders [(Conduct Disorder (CD) and Oppositional Defiant Disorder (ODD)] [1]. In the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by the American Psychiatric Association, this specifier has been included only for the CD [2] and at the 11th edition of the International Classification of Diseases (ICD-11), by the World Health Organization, this specifier has been included for both, the CD and the ODD [3].

This specifier applies for children and adolescent with CD and ODD who developed at least two of the following four criteria in the last 12 months:

A. Lack of remorse or guilt

B. Callous lack of empathy

C. Unconcern about performance

D. Shallow deficient affect.

The prevalence of the specifier in the community sample has been describe about 10-32% increasing up to 21-50% in clinical samples [4]. However, regarding the dimensional approach of the construct, some specific genetic and environmental factors has been found to be more associated with the presence of LPE in children and adolescents who had not necessarily met criteria for CD or ODD, with a prevalence of the specifier of 2% to7% in

community samples and for 14% to 32% in clinical samples without disruptive behavior disorders [4]. However, to date, data is lacking that supports the construct that LPE specifier could be a transdiagnostic entity that confers severity and impact on long term psychopathology prognosis in patients with any disruptive behavior disorder [5].

Some studies have demonstrated that the presence of LPE specifier is associated with deficits specifically at the affective component of empathy, with patients showing diminished emotional reactivity in the face of others suffer [6,7]. This association remains significant due to control of variables like impulsivity and behavior problems. Meanwhile, the evaluation of the cognitive component of empathy has revealed contradictory results [7-9]. On the other hand, some results supported that the difference between alterations on cognitive and affective subtypes of empathy could be gender and age specific, that females with LPE specifier show worst performance at both, cognitive and affective subtypes of empathy since childhood to adolescence, and male with LPE specifier improved cognitive performance when reached adolescence [9]. Since the conceptualization of LPE specifier has been though adaptations from adults' observations and be manifested with high variability according to the age, gender and the associated psychiatric diagnosis, is important to establish the affectation of affective and cognitive empathy subtypes in adolescent populations. Considering that empathy constitutes one of the main characteristics of LPE specifier is necessary to determine its roll in categorical as much as the dimensional evaluation instruments. The aim of the present study was to analyze the correlation between categorical and dimensional LPE specifier with the affective and cognitive function of empathy in a population of Latin-American adolescents.

Materials and Methods

Participants

The sample was comprised by adolescents 13 to 18 years old from the Clínica de Adolescentes, an outpatient service at the Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz in Mexico City Participants inclusion criteria were:

1. Male and female population between 13 to 18 years old who came to psychiatric visit periodically,
2. Full fit the LPE specifier categorical criteria by Kiddie Schedule for Affective Disorders and Schizophrenia present and life version DSM-5 (K-SADL-PL-5),
3. Grant their comprehensive assent and their parents their comprehensive consent by name and signature. Patients with psychotic disorder due to substance use, psychotic disorder due to another medical conditions, schizophrenia with current positive symptoms, affective disorder with psychotic symptoms by the moment of the study and those who did not comprise the instrument requirements or this not been fully filled were excluded. All the rules established in the Declaration of Helsinki for research on human beings were followed. The study has the approval to be conducted by Research ethics committee from the Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz (CEI-010-20170316).

Materials

K-SADS-PL-5: This is a semi-structured diagnostic interview designed to collect information from the adolescents and their parents/tutors or others close informants. The trained interviewer obtained a better clinical estimate or summary of each symptom of the category. In this study, we only use the LPE specifier section, which correspond to the 4 diagnostic criteria of the specifier with questions according to each criterion addressed to the patient and parent/tutor. In the validation study according to DSM 5 version, the interrater reliability for the LPE section was 0.29 (0.03-0.55) with a correlation of 0.99 with the disruptive conduct disorders factor [10].

Inventory of callous unemotional (ICU): This scale was developed by Kimonis & cols [11], consist in a 24-item questionnaire with parent/tutor and self-report versions, half of them are written in positive manner and the other half in negative manner, answered on a 4-points Likert scale (0: totally disagree, 1:disagree, 2:agree, 3:totally agree).

The factorial analysis revealed a 3-factor structure:

1. Limited empathic response (indifferent)
2. Lack of concern or care about performance and interpersonal relations (uncaring), and
3. Diminished emotional expression (unemotional).

Nine questions of the ICU belong to the first factor, 8 questions to the second and 5 questions to the third factor [12]. The global ICU in the self-report version has a Cronbach's alpha of 0.83 and for each factor was 0.80 (limited empathic response), 0.75 (lack of concern about performance and interpersonal relations and 0.71 (diminished emotional expression) [11,13]. Mexican validity process developed in 163 adolescents, not yet published, demonstrated a Cronbach's alpha of 0.86 for the self-report instrument and 0.87 for the parent/tutor version. Inter-informant reliability between parents/tutors and children reported a good correlation (r=0.83).

Global empathy scale: Jollife & Farrington [14] developed this instrument, consist in a 20-item questionnaire with parent/tutor and self-report versions, answered on a 5-points Likert scale (1: totally disagree, 2: disagree, 3: neutral, 4: agree, 5: totally agree). This scale comprises questions about the cognitive and the affective components of empathy which allows the evaluations of both in a separately and globally manner. The correlation of the self-report and parent/tutor versions showed a range from 0.26 to 0.52 for the cognitive factor and from 0.12 to 0.49 for the affective factor.

The self-report version showed a Cronbach´s alpha of 0.70 for the cognitive subscale and 0.66 for the affective subscale. The parent/tutor version showed a Cronbach's alpha of 0.76 and 0.74 for the cognitive and affective subscale respectively [15].

Process

All adolescents received a clinical evaluation by a 10-year experience psychiatrist that determined the current presence of any disruptive behavior disorder. After they gave the comprehensive assent/consent, LPE specifier section of the K-SADS-PL-5 was applied by the main research for the diagnosis confirmation, checking carefully the presence in the last 12 months for all criteria that conform LPE specifier. After this procedure ICU and GES were applied in the self-report and parent/tutor versions. Only those fully filled all instruments entered to the statistical analysis.

Statistical analysis

For clinic and demographic data, frequencies and proportions for the categorical variables were calculated, mean and standard deviation (SD) for the continuous variables with parametric distribution and median and interquartile range for continuous variables with non-parametric distribution. For the relation between the categorical diagnosis of LPE specifier obtained by K-SADS PL 5 and the GES global, cognitive and affective subscales, categorization of the populations was made based on those above and below the median of each GES score. Based on that, a X^2 analysis was performed with the presence of LPE specifier as dependent variable and the cognitive, affective and global proportions of supra or infra score as independent variable. Finally, for the correlation between the LPE specifier severity obtained by ICU and the GES global, cognitive and affective scores, Spearman coefficient was obtained with severity of LPE specifier and their factors as dependent variable and GES global, cognitive and affective score as independent variable. Comparisons between male and female populations and between self-report and parents/tutors reported data were done. For inter-informant reliability, Kappa Cohen´s test was calculated. The alpha error level stablished for significance was 0.05 and the analyses was performed with SPSS-20 analyses package.

Results

From October 2018 to May 2019, a total of 80 participants were invited to participate, all they presented at least one disruptive behavior disorder. Of those, 54 met criteria por LPE specifier by the K-SADS-PL-5 LPE section. We excluded 5 patients due to problems in filling of the instruments so that 49 participants which full data were able to enter in the statistical analysis. The mean age of the sample was 15.3 years (SD=1.6) with a male proportion of 59.1%. (n=29). The sociodemographic, ICU and GES data are described in Table 1. "Unconcern about performance" and "Callous lack of empathy" were the most frequent observed criteria for male and female respectively when LPE specifier was determinated by K-SADS-PL-5. The interrater Cohen´s Kappa was fair to moderate between parents/tutors and adolescents' answers. Details are shown in Table 2.

Table 1: Sociodemographic, ICU and GES characteristics in male and female.

Participants N=49	Sex (%)	Age (SD)	Scholarship (SD)	Participants with a Scholar year repeated (%)
Male Female	29 (59.10)	15.03 (1.37)	9.7 (1.61)	7 (24.13)
	20 (40.80)	15.85 (1.87)	10.9 (2.12)	4 (20)
ICU (N=49)				
	Total	**F1 Indifferent**	**F2 Uncaring**	**F3 Unemotional**
	Mean (SD)	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
	Median	**Median**	**Median**	**Median**
ICU Self-report				
Male Female	58.08 (11.09) 59	26 (5.16) 25	19.8 (4.94) 20	12.9 (2.98) 13
	58.6 (12.9) 56	26.65 (6.18) 27	18.3 (6.01) 17.5	13.7 (3.7) 12
ICU Parents-report				
Male Female	63.41 (8.33) 60	27.68 (4.28) 27	22.37 (4.65) 23	13.34 (2.62) 14
	55.45 (8.09) 55.5	25.4 (5.97) 24.5	18.4 (4.04) 18	11.65 (2.27) 11

GES (N=49)			
GES self-report			
	Total Mean (SD) Median	**Affective Mean (SD) Median**	**Cognitive Mean (SD) Median**
Male	3.02 (0.63) 2.9	2.69 (0.76) 2.54	3.42 (0.71) 3.44
Female	3.21 (0.59) 3.3	3.02 (0.76) 3	3.45 (0.61) 3.5
GES parents-report			
Male	3.18 (0.59) 3.1	3.09 (0.75) 3	3.29 (0.57) 3.3
Female	3.64 (0.49) 3.6	3.57 (0.60) 3.5	3.72 (0.49) 3.6

SD=Standard deviation, ICU=Inventory of Callous-Unemotional traits, GES=Global Empathy Scale.

Table 2: Limited Prosocial Emotions in K-SADS-PL-5 descriptive data.

K-SADS PL-5.1 N=49	LRG (%)	CLE (%)	UAP (%)	SDA (%)
Total	41 (83.6)	40 (81.6)	43 (87.7)	39 (79.5)
Male	25 (86.2)	23 (79.3)	28 (96.5)	23 (79.3)
Female	16 (80)	17 (85)	15(75)	16 (80)
Inter-informant κ Cohen	0.48	0.32	0.3	0.56

LRG=Lack of remorse or guilt, CLE=Callous lack of empathy, UAP=Unconcern about performance, SDA=Shallow deficient affect.

In the analysis between LPE specifier K-SADS-PL-5 diagnosis and the self-report version of the GES, 22% of the male participants with LPE specifier were above the median of the affective subscale, while 77% were above the median of the cognitive subscale (X^2=5.78, p<0.05). Between LPE specifier K-SADS-PL-5 diagnosis and the self-report version of the GES, 40% of female participants with LPE specifier were above the median of the affective subscale and 70% above the median of the cognitive subscale (X^2=0.70, p=0.4). The difference between males and females was mainly at the expense of the "callous lack of empathy" criterion of the LPE specifier, which itself encompass the greater difference between affective and cognitive proportions in male population (X^2=4.83, p<0.05). Also, in the self-report and parent/tutor reported GES the difference between the affective and cognitive functioning was significant (self-report: X^2=10.99, p<0.05, parent/tutor report: X^2=3.47, p<0.05), principally in the "callous lack of empathy" criterion, which encompass the greater difference, particularly in the self-report version (X^2=5.80, p<0.05). A significant inverse correlation was observed between ICU total and GES values self–report in global, affective and cognitive subscales for males and females. Interestingly this significant inverse correlation between ICU total values and GES values for parent/tutor report only was observed in global and affective subscale for males. ICU indifferent factor showed any significant correlation with GES values self or parent/tutor reports. However ICU uncaring and unemotional factors showed significant correlations with GES values only in male participants. Details are shown in Table 3.

Table 3: Correlation analysis between ICU and GES in males and females.

N=49		GES Global		GES affective		GES Cognitive	
ICU Total		Self-report	Parent/tutor report	Self-report	Parent/tutor report	Self-report	Parent/tutor report
male	29	-0.54**	-0.40*	-0.47*	-0.37*	-0.47*	-0.11
female	20	-0.54*	-0.31	-0.46*	-0.32	-0,49*	-0.32

ICU indifferent factor							
male	29	-0.31	-0.27	-0.28	-0.27	-0.29	-0.31
female	20	-0.41	-0.12	-0.4	-0.07	-0.31	-0.81
ICU uncaring factor							
male	29	-0.42*	-0.47*	-0.34	-0.43*	-0.42*	-0.21
female	20	-0.37	-0.31	-0.31	-0.43	-0.31	-0.19
ICU unemotional factor							
male	29	-0.44*	-0.08	-0.45*	-0.08	-0.3	0.03
female	20	-0.28	-0.07	-0.17	-0.09	-0.34	-0.41

ICU= Inventory of callous-unemotional traits, GES=Global Empathy Scale.
Bold shows statistically significant correlations
* p<0.05, ** p<0.005

Discussion

This research demonstrated that male and female adolescent population with LPE specifier presented an altered global empathetic functioning. The alteration on the affective subtype was more pronounced in male population with a higher cognitive/affective ratio. This finding shows that the diminished emotional or affective response derived from the observation of the suffering of others, not necessarily involved lack of comprehension about the circumstances that generates this emotional state. In other words, an adolescent that explicitly understands the emotional states and thoughts of others (adequate cognitive empathy) is unmoved by this understanding (less affective empathy). This profile has been characterized before in other male adolescent populations with callous unemotional traits and has been considerate a hallmark of this condition [6,9]. Our results reproduce this previous observation on our population with the LPE specifier who has been diagnosed by the categorical instrument K-SADS-PL-5. Also, by the evaluation of the severity of LPE with the ICU, we reaffirmed this finding, with the correlation of more severity of LPE with worst global, affective and cognitive empathetic level.

This empathy profile could contribute to explain previous findings in children and adolescents with high levels of callous unemotional traits or LPE specifier and severe trajectory of antisocial behavior whom characteristically manifest high levels of proactive or instrumental aggression and unique social-cognitive and neurobiological signs related to the emotional stimuli processing and reinforcement learning [16]. Some other studies founded that impaired empathy is a core characteristic in children and adolescents diagnosed with LPE specifier but, until now, the findings about the specific cognitive deficits are still limited and contradictory [17,18]. Recent researches have shown, in a similar clinic population, a specific impairment of affective subtype of empathy patients with CD and LPE specifier but no significant difference in perspective taking as an aspect of cognitive subtype of empathy [19]. In the same way, the findings from adult male coming from the community showed that some important features of psychopathy are associated with weaker affective empathic response to fearful faces [20], and in incarcerated adolescents, the callous/unemotional factor of psychopathy was related to deficits in empathy, lower emotional distress and social information-processing pattern [21]. The main findings of the study are inconsistent between informants, as the higher cognitive/affective empathy ratio was present mainly in the self-report version of the questionnaire than in the parent/tutor version. Some discrepancy between the self and parent/tutor reports at the empathy functioning has been described before in a study with autism spectrum disorder participants, where the adolescent population reported lesser grade of disease symptomatology and better empathetic functioning than their parent/tuor report [22]. On the other hand, some other authors have found deficits in the self-report version of the empathetic construct, due to bias related to the subjectivity of the instrument, and because of difficulties associated with the developmental stage to identify internal and external emotional states and to develop the cognitive and verbal competences to make an accurate report of them [23].

Other measures to investigate empathy has been used over time for children and adolescents, including the picture or story method, consisted in narrative and visual stimuli which aim to evoke an emotional response; or the experimental paradigms, designed to induce empathy in the participants, the coding of children facial gestures or reactions to emotional stimuli, and finally, the self-report questionnaires which could be improved, like in this study, by the report of the parent/tutor and are the most used in adolescent and adult populations [24]. An important finding in our study is that the significant difference between affective and cognitive scores in male populations with LPE specifier was only reported at the self-report version. This could be due to a limitation of the K-SADS-PL-5 interview to evaluate with accuracy the 4 criteria with the questions addressed for the parent/tutor or due to some limitations in the capacity of the parent/tutor to read the affect showed by their offsprings, due probably to the hereditary component and, the deficits in affective empathy has an established neurobiological correlate [25]. According to this, a study which explored the association of CU traits and the cognitive and affective empathy across development in a community sample of children described that high levels of CU traits was associated

with lower parent/tutor ratings of affective empathy [9]. Further studies need to establish if categorical or dimensional evaluations of LPE specifier could be complementary in the recognition of this new condition. The study addressed several limitations that could be taken into account at the time to interpret the result: first, lack of control group without the LPE specifier make no possible to point that the findings are specific of LPE condition. Second, the sample size confers insufficient statistical power and finally, the participants came from a clinical environment of the third level psychiatric institution that make not possible to generalize the results to the community.

Conclusion

LPE specifier construct is characterized by global empathy deficits that, in deep, show a complex profile of functioning with variability that has been determinate by sex, age and even the instrument that was used to make the evaluation. Instruments that evaluate the construct in a global but also specific manner, allows the clinicians to have a better understanding and categorization of the patients and their specific profile. The categorical instrument like semi-structured or structured diagnostic interviews has been widely used for clinic and investigation purposes and counting with them to evaluate and categorize the LPE specifier make important to study their capacity to englobe the complexity and high variability of the construct. The LPE specifier section of the K-SADS-PL-5 seems to reproduce the empathy specific deficits of this clinical populations, which make important to continue the investigation in the way to improve the LPE characterization across development stages, multi-informants and inter-evaluators, searching the possibility to grant a valid instrument for the purpose of psychopathology categorization.

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