

Comorbid Association Between Attention Deficit Hyperactivity Disorder (ADHD) And Oppositional Defiant Disorder (ODD) In Children Under 18 Years Of Age In A Mental Health Institution In The City Of Bogotá, 2005-2017

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Abstract

Introduction: Attention Deficit Hyperactivity Disorder (ADHD) is a neurobiological disorder that manifests in childhood, becoming more evident with increasing academic demands (1,2). It is characterized by inattention, hyperactivity and impulsive behaviors, inappropriate for the child's developmental level (1-3). The cross-sectional studies consulted suggest a prevalence of ADHD between 12% and 22.6%. (9-12) A male to female ratio of 2 to 5.8 males for every female diagnosed with ADHD was observed. Longitudinal studies found a prevalence between 3% and 10% and a male-to-female ratio of 5.2 males to 1 female. **Objective:** To identify the association between attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) in children and adolescents under 18 years of age seen at Our Lady of Peace Clinic (CNSP) between 2005 and 2017. **Materials and methods:** A longitudinal study was conducted on a population of patients under 18 years of age with a confirmed diagnosis of ADHD. The data came from the individual health service delivery records (RIPS) of the CNSP. Statistical analysis of the data was done using descriptive statistics, acyclic directional plots to determine possible relationships between ADHD and ODD, and negative binomial regression to establish the association between ADHD and ODD. **Results:** The results confirmed a significant association between ADHD and ODD 2.6 CI (2.42; 2.8), with a proportion of occurrence of the event of 17.8% in the patients analyzed and a masculinity ratio of five boys for every girl diagnosed with ADHD. Regarding ODD, an occurrence proportion of 3% and a masculinity ratio of 3 males for every female diagnosed with the event. For every 100 children with ADHD, 8 had ODD. But, out of every 100 children with ODD, 50% presented ADHD, Discriminate by age groups, from 5 to 12 years old and from 13 to 17 years old, the presence of ODD in ADHD. **Conclusions:** The results confirmed a significant risk association between ADHD and ODD, with males being more affected by ADHD and ODD than females. Half of the children with ADHD had ODD.

Keywords: ADHD; TOD; children; adolescents; association.

Asociación comórbida entre el trastorno por déficit de atención e hiperactividad (TDAH) y el trastorno opositor desafiante (TOD) en menores de 18 años en una institución de salud mental de la ciudad de Bogotá. 2005-2017

Introducción. El trastorno por déficit de atención con hiperactividad (TDAH) es un trastorno neurobiológico que se manifiesta en la infancia, haciéndose más evidente con el incremento de la exigencia académica (1,2). Se caracteriza por falta de atención, hiperactividad y comportamientos impulsivos, inadecuados para el nivel de desarrollo del menor (1-3). Los estudios transversales consultados sugieren una prevalencia de TDAH entre el 12% y el 22,6%. (9-12) Se observó una razón de masculinidad entre 2 y 5,8 hombres por cada mujer diagnosticada con dicha afección. En los estudios longitudinales se observó una prevalencia entre el 3% y el 10% y una razón de masculinidad de 5,2 hombres por cada mujer. **Objetivo.** Identificar la asociación entre el trastorno por déficit de atención con hiperactividad (TDAH) y el trastorno opositor desafiante (TOD) en niños y adolescentes menores de 18 años atendidos en la Clínica de Nuestra Señora de la Paz (CNSP) entre los años 2005 y 2017. **Materiales y métodos.** Se hizo un estudio longitudinal de una población de pacientes menores de 18 años con diagnóstico confirmado de TDAH. Los datos provienen de los registros individuales de prestación de servicios de salud (RIPS) de la CNSP. El análisis estadístico de los datos se hizo mediante estadísticos descriptivos, diagramas direccionales acíclicos para determinar posibles relaciones entre TDAH y TOD y una regresión binomial negativa para establecer la asociación entre TDAH y TOD. **Resultados.** Los resultados confirmaron una asociación significativa entre el TDAH y TOD 2.6 IC (2.42; 2.8), con una proporción de ocurrencia del evento del 17.8% en los pacientes analizados y una razón de masculinidad de

cinco niños por cada niña diagnosticada con TDAH. Respecto al TOD, una proporción de ocurrencia del 3% y una razón de masculinidad de 3 hombres por cada mujer diagnosticada con el evento. Por cada 100 niños con TDAH, 8 presentaron TOD. Pero, de cada 100 niños con TOD, el 50% presentaron TDAH.

Conclusiones: Los resultados confirmaron una asociación de riesgo significativa entre el TDAH y TOD, siendo los hombres más afectados por el TDAH y el TOD que las mujeres. La mitad de los niños con TDAH presentaron TOD.

Palabras clave: TDAH; TOD, niños; adolescentes; asociación

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a neurobiological disorder that manifests in childhood, becoming more evident with increasing academic demands (Zuluaga-Valencia & Fandiño-Tabares, 2017). It is characterized by inattention, hyperactivity and impulsive behaviors, inappropriate for the developmental level of the minor (Miranda et al., 2016; Willcutt, 2012). In children and adolescents, this disorder hinders the processes of self-control, the effective management of emotional expression, the ability to retain attention, concentration and focus, competencies in the control of impulsive acts, the inability to finish a task, the control of their behavior, and the ability to master the level of activity in their context and the measurement of the consequences of their actions (González et al., 2017; Miranda et al., 2016)

ADHD is one of the main mental and behavioral

disorders in school-aged children, being a chronic disease that is likely to persist throughout their lives (Gutiérrez Díez et al. 2008; Zuluaga-Valencia & Fandiño-Tabares, 2017). This syndrome usually coexists with other morbidities that can worsen the clinical picture or interfere in the timely or accurate diagnosis of ADHD (Spencer, 2006; Willcutt, 2012; Zuluaga-Valencia & Fandiño-Tabares, 2017).

According to Orellana (), Oppositional Defiant Disorder (ODD) is one of the most frequent comorbidities in children and adolescents with ADHD. The DSM-V states that ODD is a behavioral disorder characterized by inappropriate behavior for the social context and personal development, with negativistic, defiant, disobedient and hostile behaviors towards authority figures. Such behavior substantially affects their social, academic and even occupational life, since their relationship with their parents, siblings, teachers and close circle is altered.

According to Díaz Atienza (2014), ADHD as a single pathology is very rare, with comorbidity estimated at more than 60%.

In a longitudinal study, the prevalence of ADHD was found to be between 8.8 and 22.9% of ODD between 1.7 and 7.6%. The OR of both comorbidities was between 1.42 and 3.81 for preadolescents and 17.3 and 27.7 for adolescents. A battery of internationally validated instruments for parents and children was used as a diagnostician; the authors are clinical psychologists (Granero et al., 2008).

In the cross-sectional descriptive study by Zuluaga et al. (2017), based psychologists observed that ADHD-ODD comorbidity was present in 18 out of 100 children characterized in their analyses.

The National Resource Center on ADHD () states that 40% of patients diagnosed with ADHD have comorbidity with ODD.

Zametkin & Ernst (1999) found that the frequency of ODD in the general population is between 2 to 16%, with a male to female ratio of three to one. In contrast, other studies stated that the masculinity ratio for ADHD is between 2 and 5 males for every female (Bhatia et al., 1991; Cornejo et al., 2005; and Pineda, 2001).

Other research on comorbidities state that ADHD is associated with other disorders 75% of the time, being ODD the main comorbidity found (between 15 to 60% of children diagnosed with ADHD, presented comorbidity with ODD) (Ratera et al., 2006), but in children and adolescents diagnosed with ODD, between 69 and 80% presented ADHD (Szatmari et al., 1989).

ODD + ADHD increase the risk of suffering a behavioral disorder in adolescence and antisocial personality in adulthood (Szatmari et al., 1989).

In the Colombian context, it was found that one of the disorders with greater comorbidity with ODD is ADHD. Between 30 to 50% of patients with ADHD also have an ODD disorder (Ortiz Giraldo et al., 2008).

In the Colombian Caribbean region, it was found that 44% of schoolchildren with ADHD also coexist with ODD (Llanos Lizcano et al., 2019).

The information available on the comorbid association between ADHD - ODD in Colombia did not find research with longitudinal characteristics like the present study, nor was it conducted in a reference institution which receives an annual average of 14,000 users (approximately 10% of this population are under 18 years). Most of the studies carried out at the national level are cross-sectional studies, which describe the percentage of coexistence of both morbidities but do not measure the level of association between them.

It should be noted that, in the Colombian studies consulted, the authors are psychiatrists who

diagnosed both ADHD and ODD under clinical criteria. In the present study, the diagnosis was made by psychiatrists with a second specialty in child and adolescent psychiatry, graduates hired by the CNSP, in compliance with the qualification requirements demanded by the health regulatory body for institutions offering child psychiatry services, who used the clinical method, with semi-structured interviews with parents and minor patients and filled out the clinical history of the CNSP information system, which increases the confidence that the diagnoses are accurate.

In the international literature consulted, it was observed that, in spite of presenting longitudinality in the information, those who determined the coexistence of ADHD were psychologists, supported by a great diversity of batteries of instruments that give them a diagnostic criterion of ADHD and ODD through the perception of the parents and self-report of the children and young people themselves, but they lack medical criteria that allow determining if the symptoms of both events are not overlapping other comorbid disorders different from the ones of interest. A longitudinal study followed by physicians in a hospital setting was found, but it is very old (1989).

The present study aims to update the available information, the association of ADHD and ODD in the local context, through an Institution providing health services of reference in mental health at the national level, through the individual records of health services (Ministry of health and social protection, 2018) for fifteen years to approximately 35000 children and adolescents who consulted in the health service.

The present research aims to describe the association between ADHD and ODD in minors who consulted a health service. Also, to know the main mental and behavioral disorders of children who consulted during the study period and to obtain the proportion of occurrence of ADHD

and ODD, which will be compared with the prevalences of the studies consulted.

Materials and methods

Sample

The data for this study come from the individual health service delivery records, between the years 2005-2017, of the entire population. Longitudinal database, which, with the following purifications were carried out to achieve the final sample obtained for developing the research. All the records resulting from the application of the inclusion and exclusion criteria were considered.

Inclusion criteria

Children under 18 years of age. Record of care in excess of 2005.

Exclusion criteria

Over 18 years of age, records of care less than 2005, non-medical diagnoses (therapeutic equipment). Records with deficient data quality.

Instruments

SNAP IV, ICD-10, Conners 10 or 30 questions were used in most clinic psychiatrist physicians. There was no standard in the measurement of ADHD among clinic physicians until 2018.

Statistical analysis

Initially, a descriptive univariate and bivariate analysis was performed to estimate the proportion of occurrence of diagnoses of mental and behavioral disorders in children under 18 years of age and the proportion of occurrence of ADHD and ODD by sex.

Cross-sectional comorbidity (occurrence) and longitudinal comorbidity (concurrence over time) were studied,

Finally, the negative binomial regression model assessed the association between ADHD and ODD.

In the present association, the causality of ADHD with respect to ODD will not be evaluated, since it is unknown which pathology caused the comorbidity. The study will analyze the ODD that, over time, presented comorbidity with ADHD and vice versa.

The descriptive analyses and the analysis of association will be managed in Stata 12 and in Ms Excel for the information outputs.

RESULTS

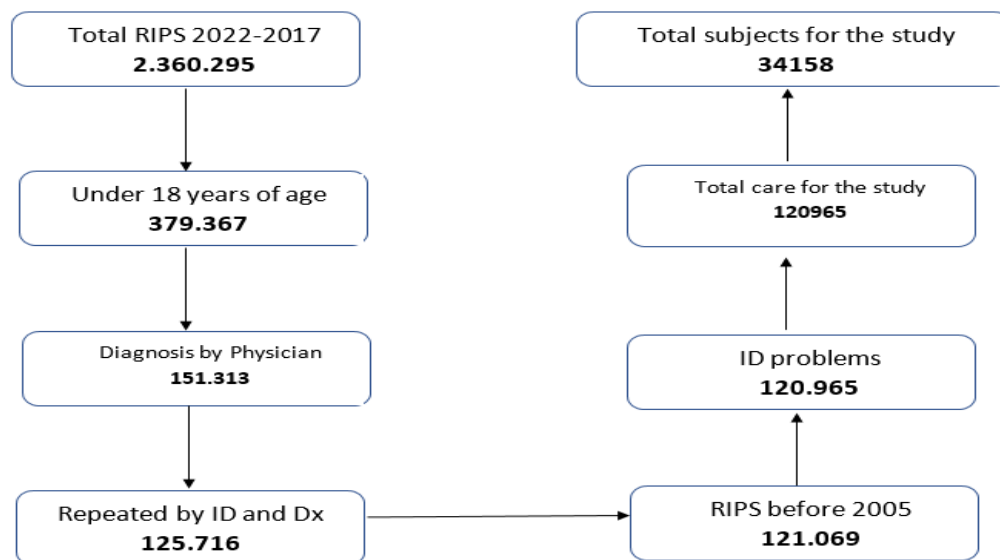


Figure 1. Criteria for the selection of study subjects and their care.

The years where the most services were provided for children and youth under 18 years of age, was between 2012 and 2015 with 44% of the total data reported for this population during the 15 years of study.

The average age is 11.22 years (CI (11.18; 11.26)), with standard deviation of 4.24 years; 50% of the study subjects were under 12 years old. The majority of the study participants are 15 years old.

General characterization of patients under 18 years of age in the CNSP

In the analysis of comorbidities associated with ADHD in children under 18 years of age in the CNSP, 34158 subjects were found in its population who met the selection criteria. Fifty-eight percent were male. Of the study subjects, 63% did not specify their level of schooling, 17% did not attend school and 10% reported having completed primary school. All the participants in the study belonged to the urban area, most of them were affiliated to the contributory regime and were attended by outpatients.

Regarding the proportion of occurrence of diagnoses of mental health disorders (MHD) in children under 18 years of age seen at CNSP in the years 2005-2017, it was observed that the main events recorded were in their order behavioral disorder in children and adolescents (52%), attention deficit and hyperactivity disorders (44%), depressive-type mood disorders (29%), mental retardation (26%), developmental disorders (20%), anxiety disorders and phobias (18%), stress disorders and adjustment disorders

(16%), specific learning disorders (12.5%), psychoactive substance use disorder (10%), bipolar mood disorders and mania (6.2%).

Oppositional defiant disorder was present in 4.3% of the youth.

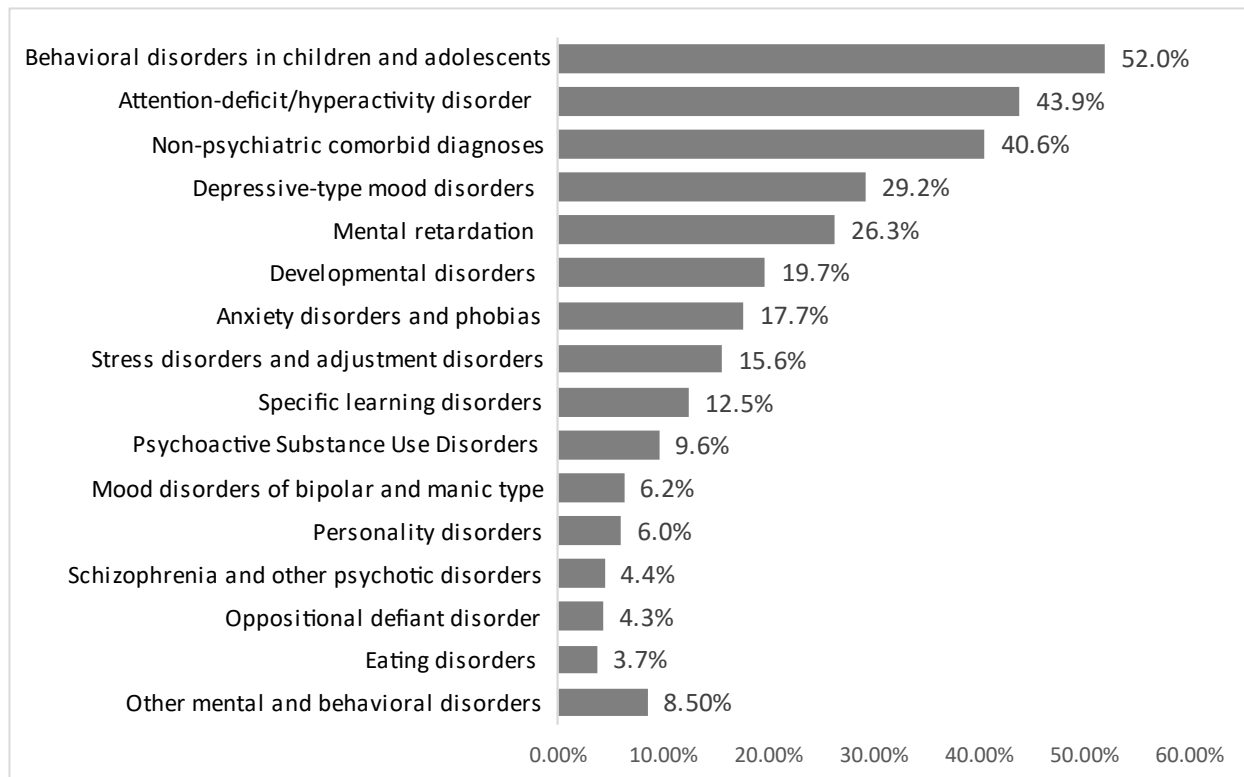


Figure 2. Proportion of occurrence of mental health events in children under 18 years of age in the CNSP, 2005-2017.

Regarding the proportion of CMD by sex, it was observed that 17 males for every 10 females consulted the mental health service.

The main causes of attendance to the health service in men were ADHD (64%), followed by behavioral disorders in children and adolescents (54.6%), mental retardation (31%), developmental disorders (28%), depression (18%), learning disorders (17%), anxiety disorders and phobias (14%) and use of

psychoactive substances (13%), stress and adjustment disorders (11%) and oppositional defiant disorder (6%).

On the other hand, in the case of women, the following were observed: behavioral disorders in children and adolescents (46%), depression (44%), anxiety disorders and phobias (22%), adjustment and stress disorder (22%), mental retardation (20%), ADHD (17%), bipolar disorder (8%) and developmental disorders (8%).

| EVENTO | POC 2005 | POC 2006 | POC 2007 | POC 2008 | POC 2009 | POC 2010 | POC 2011 | POC 2012 | POC 2013 | POC 2014 | POC 2015 | POC 2016 | POC 2017 | POCTOTAL |
|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Behavioral disorders in children and adolescents | 24.8% | 77.6% | 58.0% | 55.9% | 53.0% | 53.2% | 52.8% | 41.9% | 52.5% | 48.0% | 47.8% | 57.1% | 81.7% | 52.0% |
| Attention-deficit/hyperactivity disorder | 33.3% | 14.2% | 23.9% | 37.7% | 51.0% | 46.3% | 42.4% | 42.9% | 55.3% | 52.6% | 49.6% | 47.9% | 57.2% | 43.9% |
| Non-psychiatric comorbid diagnoses | 15.4% | 58.4% | 32.2% | 29.2% | 27.9% | 29.3% | 31.9% | 46.1% | 59.4% | 40.0% | 31.7% | 57.4% | 91.2% | 40.6% |
| Depressive-type mood disorders | 47.5% | 58.8% | 34.0% | 31.8% | 33.2% | 28.8% | 23.8% | 21.5% | 24.4% | 20.9% | 23.2% | 24.9% | 29.9% | 29.2% |
| Mental retardation | 10.7% | 25.4% | 15.7% | 25.2% | 28.2% | 31.7% | 31.9% | 25.8% | 28.9% | 26.7% | 26.2% | 29.5% | 43.2% | 26.3% |
| Developmental disorders | 6.6% | 16.4% | 17.1% | 18.8% | 21.0% | 19.4% | 23.3% | 22.0% | 24.1% | 21.4% | 19.0% | 19.2% | 22.8% | 19.7% |
| Anxiety disorders and phobias | 11.1% | 15.4% | 19.6% | 16.4% | 19.6% | 16.0% | 15.6% | 19.0% | 21.6% | 17.7% | 17.1% | 18.2% | 17.0% | 17.7% |
| Stress disorders and adjustment disorders | 13.0% | 6.4% | 13.1% | 16.8% | 11.7% | 12.3% | 10.0% | 16.3% | 14.7% | 19.0% | 19.0% | 23.9% | 22.7% | 15.6% |
| Specific learning disorders | 2.1% | 2.3% | 5.2% | 3.8% | 3.6% | 5.1% | 6.6% | 14.1% | 19.4% | 18.9% | 17.1% | 26.3% | 34.1% | 12.5% |
| Psychoactive Substance Use Disorders | 1.1% | 1.8% | 2.2% | 4.6% | 7.3% | 8.0% | 8.1% | 8.3% | 13.4% | 14.8% | 15.3% | 17.0% | 14.5% | 9.6% |
| Mood disorders of bipolar and manic type | 5.7% | 13.9% | 9.9% | 17.9% | 10.5% | 5.8% | 4.1% | 3.6% | 4.1% | 3.5% | 2.7% | 2.5% | 2.0% | 6.2% |
| Personality disorders | 1.9% | 8.8% | 8.4% | 6.9% | 6.0% | 6.2% | 5.1% | 4.8% | 9.4% | 5.2% | 4.3% | 4.9% | 6.5% | 6.0% |
| Schizophrenia and other psychotic disorders | 2.6% | 4.7% | 3.1% | 6.0% | 5.4% | 4.7% | 4.0% | 3.7% | 4.0% | 3.9% | 4.8% | 5.3% | 6.7% | 4.4% |
| Oppositional defiant disorder | 4.4% | 1.5% | 4.1% | 4.6% | 2.9% | 1.7% | 2.5% | 7.2% | 7.4% | 5.2% | 3.0% | 2.9% | 4.1% | 4.3% |
| Eating disorders | 0.9% | 1.6% | 2.5% | 3.3% | 3.5% | 5.3% | 3.4% | 4.6% | 5.4% | 3.6% | 3.8% | 3.6% | 4.1% | 3.7% |
| Obsessive-compulsive disorder | 3.7% | 3.0% | 3.8% | 4.5% | 4.4% | 3.3% | 3.0% | 1.3% | 3.4% | 3.4% | 2.4% | 2.3% | 4.9% | 3.2% |
| Dementias and other organic mental disorders | 1.6% | 6.2% | 4.6% | 3.6% | 2.9% | 3.7% | 1.5% | 1.5% | 2.4% | 3.0% | 2.9% | 3.4% | 4.0% | 3.0% |
| Sleep disorders | 0.7% | 1.7% | 1.0% | 1.4% | 1.3% | 1.0% | 1.7% | 0.8% | 0.9% | 0.8% | 1.1% | 0.7% | 1.1% | 1.1% |
| Dissociative and somatoform disorders | 0.8% | 1.3% | 1.2% | 1.9% | 1.3% | 0.6% | 1.2% | 0.7% | 0.8% | 0.8% | 0.7% | 0.8% | 0.8% | 1.0% |
| Unspecified mood disorders | 0.0% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.2% | 0.1% | 0.2% | 0.1% | 0.6% | 0.0% | 0.1% |
| Non-organic sexual disorders and dysfunctions | 0.2% | 0.1% | 0.1% | 0.2% | 0.0% | 0.0% | 0.1% | 0.0% | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.1% |
| Non-psychoactive Substance Use Disorders | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mental disorders in the postpartum period | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Total | 188.29% | 319.75% | 259.83% | 290.55% | 294.77% | 282.32% | 273.22% | 286.64% | 351.62% | 309.78% | 291.90% | 348.37% | 448.22% | 299.97% |

Figure 3. Proportion of occurrence of mental health events in children under 18 years of age in the CNSP by year, 2005-2017.

Characteristics of attention deficit hyperactivity disorder and oppositional defiant disorder in the study population

A total of 6096 patients diagnosed with ADHD in the 15 years of the study represents 17.84% of the total population under 18 years of age attended. Although it was observed that the proportion of consumption of mental health services in the population between men and women is "similar" to each other, it was found that the ratio of ADHD occurrence between both sexes corresponds to 5.08 men for every woman.

ADHD is the leading cause of consultation to the mental health service by men (64%) and the seventh in women (17%). Towards the last years of the time series it was visualized that ADHD was the second reason for consultation after behavioral disorders in children and adolescents. The average age was 9.5 years, 50% of the minors were under 9 years old and the majority were 8 years old. The average age in males was 9.5 years and in females 9.7 years.

A total of 996 patients diagnosed with ODD in the 15 years of study represents 3% of all children under 18 years of age seen in the institution. The male-to-female ratio was 3.1 males for every female with ODD. Among males, 5.7% presented ODD being the twelfth reason for consultation. In females it was 2.4%, the sixteenth reason for consultation.

8.2% (496 of 6096) of patients with ADHD also presented with ODD.

48.8% (496 of 996) of children and youth with ODD had ADHD as a comorbidity.

Association between ADHD and ODD

An association between the two disorders was hypothesized using an X² test, which yielded a Pearson $\chi^2(1) = 56.50$ and a P value = 0.000, indicating that there is a statistically significant association between ADHD and ODD.

A bivariate association between ADHD and ODD was estimated for the under-18 population without longitudinality of the data (attendances during the 15 years of retrospective follow-up) using a two-by-two table to obtain the hazard ratio with its confidence intervals and obtained an $OR = 2.090581$ CI (1.71813; 2.54378) which indicates that, for every child under 18 years of age with a diagnosis of ADHD, there is twice the risk of presenting ODD with respect to young people without attention deficit disorder.

Multivariate analysis

For the longitudinal analysis of the cohort (all ADHD and ODD-related care), it was calculated through a negative binomial regression whose result was expressed in relative risk to define the association between both study events. The association being statistically significant, a relative risk of 2.6 CI (2.42; 2.8) was determined, therefore, the risk of presenting ODD given a young person diagnosed with ADHD is 2.6 times that of a young person without ADHD.

| tdah | Risk Ratio | Std. Err. | z | P>z | [95% Conf. Interval] | |
|-------------|-------------------|------------------|----------|---------------|-----------------------------|-----------------|
| tod | 2,591228 | 0,090823 | 27,16 | 0.000 | 2,419195 | 2,775494 |
| _cons | .1302529 | .0009745 | -272.44 | 0.000 | .1283568 | .132177 |

The analysis of ADHD as a function of ODD will now be discussed, in which a statistically significant association and a relative risk of 3.318 CI (3.002; 3.666) is also observed. Therefore, the

risk of presenting ADHD given that a young person is diagnosed with ODD is 2.3 more that of a young person who does not have ODD.

| tod | Risk Ratio | Std. Err. | z | P>z | [95% Conf. Interval] | |
|------------|-------------------|------------------|----------|---------------|-----------------------------|-----------------|
| tdah | 3.317632 | .1691663 | 23.52 | 0.000 | 3.002102 | 3.666326 |
| _cons | .0105758 | .0003159 | -152.30 | 0.000 | .0099744 | .0112134 |

DISCUSSION

In general, the discrepancies between the diagnostic instruments in the cited publications suggest differences in the behavior of children in different contexts, in the sense that each author makes a differential judgment.

A great variety of articles dealing with the subject of ADHD and comorbidities is observed, in which multiple instruments were used for the diagnosis and measurement of ADHD, even within the CNSP each psychiatrist used different instruments and criteria over the years for the diagnosis of this pathology and its comorbidities, hence the disparities in the cross-sectional studies and some of the similarities in the

longitudinal studies.

Returning to the criterion problem of ADHD measurement and the variability of its prevalence, especially in the cross-sectional studies mentioned in the introduction, the DSM IV, the most widely used instrument for the diagnosis of ADHD for the authors consulted, has also been criticized and caution is suggested at the time of its application. According to Crunelle et al. () and Jensen et al. () (13,17), the diagnostic criteria do not correctly discriminate between symptom and state; therefore, prevalence estimates based on symptom criteria alone overestimate the percentage of children who meet the full DSM-IV criteria for ADHD.

However, because the results observed in cross-sectional studies may call into question the validity of several specific DSM-IV criteria, the optimal approach to estimating the prevalence of ADHD according to DSM-IV ADHD is unclear (13,17).

Prevalence estimates based on symptom criteria alone should be interpreted with caution; they provide a useful estimate of the prevalence of ADHD according to DSM-IV and each diagnostic subtype. Each reviewed author relied on additional validated questionnaires to strengthen their diagnostic criteria, which may also affect the variability of the results in estimating prevalence.

The results obtained for the CNSP were 17.84% with tools such as the DSM-IV, the Conners scale and the semi-structured interview, while Bhatia et al. presented a prevalence of ADHD of 11.2%, who used instruments such as the Conners scale, semi-structured interviews and the DSM IV for diagnosis in the 1990s, their longitudinal study was prospective and had a follow-up of the study population, while the present study was conducted with a retrospective cohort without supervised follow-up. On the other hand, studies such as those by Spencer et al, Barkley and Mirsky et al. presented prevalences between 3% and 6% despite the different diagnostic techniques applied, such as in the case of Barkley et al. who used instruments such as Conners, Child Behavior Checklist (CBCL), and 10 other instruments to determine the parents' and teachers' ratings of the young people, self-reporting by the adolescents, and psychological tests. It should be noted that the time span between these studies was executed in the 1990s and early 2000s.

Unlike the aforementioned longitudinal studies, the present study is a retrospective longitudinal study, which did not perform a structured follow-up as did the previous studies, which may explain the large difference between their prevalences

and the proportion of ADHD-related care was 17.8%.

A coincidence was found between the study by Bhatia et al. and the present study regarding the ADHD masculinity ratio: Bhatia found an MR= 5.2 males for every minor female, in the CNSP the same measure was 5.08 males for every female in the same population group mentioned.

The consequence of an ADHD not treated correctly, presenting comorbidities of oppositional defiant disorder type, could lead in adulthood to greater aggressiveness and delinquency, increased substance use, social apathy and low self-esteem (8,18,23,25). The above longitudinal studies also suggest that ADHD symptomatology related to irritability and aggression is mistaken for ODD and that therapy focused on the latter pathology is adopted and ADHD is ignored (8,18,23).

In the studies of Granero et al. (2008), where they presented ORs between 1.42 and 3.81 are in a similar range to that of the present study which was OR= 2.1 CI (1.71813; 2.54378).

In the national context, the cross-sectional research of Ortiz Giraldo et al. () obtained a proportion of occurrence of ODD and ADHD between 30% and 50% and in the CNSP it was 50%, which, coincides with the national context, despite the difference between the type of study and diagnostic methods.

Szatmari et al. (), stated that between 69% and 80% of children with ODD presented ADHD, much higher than in the present study (50%). In the same study, they state that 15% of children with ADHD presented ODD, while in the CNSP it was 8%, this could be explained in that, not all children who consult with ADHD in the CNSP are made a second diagnosis for ODD, or why not, Szatmari et al. () are overestimating the proportion of occurrence, for the reasons already mentioned.

Zametkin & Ernst found the frequency of ODD in the general population to be between 2 to 16%, with a male-to-female ratio of three to one, similar results to that of the CNSP which presented 3% with the same male-to-female ratio.

In the cross-sectional descriptive study by Zuluaga et al. (), basic psychologists, who observed that ADHD-TOD comorbidity was present in 18 out of every 100 children while in the CNSP it was present in 8 out of every 100, behavior similar to that of the study by Szatmari et al. ().

The present study is the first in Colombia that presented the relative risk in a retrospective cohort between ADHD and ODD, which, it is expected that other institutions in the country will also conduct similar research and allow comparison of the values estimated here and thus, visualize standardization strategies for the joint diagnosis of ADHD and ODD.

As a recommendation from the results of the study: it is important that professionals who clinically diagnose ADHD, also explore and consider the diagnosis of ODD and vice versa, in order to generate better intervention strategies for children and young people that can improve their quality of life in adulthood.

LIMITATIONS

Lack of supervised follow-up of the retrospective cohort with a diagnostic test standard that could have changed over the course of the 15 years.

CONFLICT OF INTEREST

It is declared that there is no conflict of interest in the development of this research.

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