



Original Article

Prevalence and quality of life and sleep in children and adolescents with restless legs syndrome/Willis-Ekbom disease

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ABSTRACT

Objective: To estimate the prevalence of restless legs syndrome/Willis-Ekbom disease (RLS/WED) and its impact on sleep and quality of life in children and adolescents.**Methods:** This was a cross-sectional study conducted in the Municipality of Cássia dos Coqueiros, Brazil. Participants included 383 children and adolescents 5–17 years of age. A comparison group was randomly matched by gender and age with the RLS/WED-affected individuals, pairing one by one.**Results:** Interviews were conducted for 383 individuals by a neurologist experienced in sleep medicine. RLS/WED was diagnosed using the essential clinical criteria for definitive RLS/WED in children recommended by the International Restless Legs Syndrome Study Group. Sleep and quality of life were evaluated using the Sleep Behavior Questionnaire (SBQ) and the Health-related Quality of Life Questionnaire –Pediatric Quality of Life Inventory (PedsQL). Comparisons were established with a group of randomly selected individuals without RLS/WED, matched by age and gender (control group). The prevalence of RLS/WED symptoms that manifested at least twice a week was 1.9%. The average age of children with RLS/WED was higher compared to the general population (11.5 ± 2.3 vs 9.9 ± 2.5 , $p < 0.005$). A family history of RLS/WED was detected in 90.9% of the patients. The scores obtained by SBQ were higher (53.9 ± 9.4 vs 47.6 ± 10.9 , $p < 0.047$), whereas the scores achieved by PedsQL were lower (69.8 ± 14.8 vs 81.9 ± 10.4 , $p < 0.003$) in children with RLS/WED compared to controls.**Conclusion:** The prevalence of RLS/WED symptoms manifested at least twice in the preceding week was 1.9% in children and adolescents. Worsened sleep and quality of life were observed in the study.

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1. Introduction

Restless legs syndrome/Willis-Ekbom disease (RLS/WED) is a neurological condition characterized by the urge to move the legs and is often associated with unpleasant sensations. These symptoms appear or are worse at rest, especially during the night. Partial or complete relief is observed during mobilization [1].

Previous studies have demonstrated that the prevalence of RLS/WED in adults varies between 5% and 10% of the general population

[2,3]. Studies carried out in children, however, are less common. In 1994, Walters et al. described a small series of cases that included children with RLS/WED [4]. Subsequently, the same author found that one-third of adults with RLS/WED started to manifest symptoms when younger than 10 years of age, which indicates that a subgroup of patients may show early symptoms [5]. Moreover, several studies have demonstrated the correlation between RLS/WED and certain childhood-related diseases, such as attention deficit hyperactivity disorder [6,7] and growing pains [8]. In 2007, an extensive epidemiological population study conducted in the United States and the United Kingdom evaluated 10,523 children and adolescents through Internet questionnaires, which resulted in the estimated prevalence of RLS/WED of approximately 2.0% [9]. More recently, a cross-sectional study carried out in Turkey

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estimated that the prevalence of RLS/WED in children and adolescents was 2.7% [10].

Although it was demonstrated that RLS/WED reduces sleep [11] and quality of life in adult patients [2], studies that evaluate how this disease affects children and adolescents are scarce. Therefore, the objective of this study was to estimate the prevalence of RLS/WED in childhood, assessing its characteristics and impact on sleep and quality of life in children and adolescents.

2. Methods

2.1. Study design

This cross-sectional study was conducted over a period of 12 months using the methodology described below.

2.2. Study population

Children and adolescents between five and 17 years of age, from an urban and a rural area, enrolled at the only elementary school in the city of Cássia dos Coqueiros (CQ), Brazil, were interviewed for this study. This town is located 300 km from the city of São Paulo in the Southeast region of Brazil and has an area of 190.916 km². The town has rural characteristics and there is not any major industrial facility. The population is formed primarily by descendants of Italian immigrants and secondarily by Portuguese people with varying degrees of miscegenation. According to the population count conducted in 2007 by the Brazilian Institute of Geography and Statistics (IBGE), the population of CQ is 2.706 inhabitants (Fig. 1) [12]. This same city hosted, previously, an epidemiological study of RLS/WED carried out in adults [3].

2.3. Ethical aspects

This study was approved by the Institutional Review Board of the Ribeirão Preto School of Medicine, University of São Paulo, in Ribeirão Preto, São Paulo, Brazil. All children and their legal guardians signed the informed consent form (number 9539/2007).

2.4. Interviews

The study was conducted in two phases. In the first step, interviews were conducted face-to-face by a neurologist with sleep medicine expertise between 08:00 and 17:00 during the period from February 2008 to February 2009. The interviews were held at the school and assessed the presence of RLS/WED and collected demographic information (age, gender and ethnicity; white or nonwhite). In the second step, individuals who reported RLS/WED symptoms were interviewed again in the presence of their parents or caregivers by the same researcher at the city health clinic. The objective of the second interview was to confirm the RLS/WED diagnosis, to detect possible false-positive results, to critically assess the characteristics related to RLS/WED and to evaluate the quality of sleep and life. The assessment consisted of a clinical interview and a general physical and neurologic examination. The RLS/WED characteristics assessed in this step included the following: symptoms start time, family history of RLS/WED and frequency and region of the body affected by the symptoms. Finally, all children with RLS/WED were re-interviewed by a second neurologist and specialist in sleep medicine to confirm the disease diagnosis. In the case of disagreement between the sleep medicine specialists, a third interview was conducted by both physicians at the same time up to the final diagnosis.

2.5. Quality of life

Quality of life was evaluated in children and adolescents as well as their parents or caregivers through the Pediatric Quality of Life Inventory (PedsQL), translated into Brazilian Portuguese [13]. The PedsQL is a 23-item self-report scale for children 2–18 years of age that use four subscales to evaluate the following: (1) Physical Functioning (eight items), (2) Emotional Functioning (five items), (3) Social Functioning (five items) and (4) School Functioning (five items). The instructions for the questionnaire ask how much of a problem each item has been during the past month. A five-point response scale is used (0 = never a problem, 1 = almost never a problem, 2 = sometimes a problem, 3 = often a problem, 4 = almost always a problem). Items were reverse-scored and linearly transformed to a 0–100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0), so that higher scores indicated better health-related quality of life.

2.6. Sleep quality

Sleep quality was evaluated through the Sleep Behavior Questionnaire (SBQ), translated into Brazilian Portuguese [14]. Each item was rated with a score ranging from one (never) to five (always), according to the frequency with which each symptom manifested in the past 6 weeks. The final score could vary between 26 and 130. The higher the score, the greater the number of sleep problems, which subsequently worsened sleep quality.

2.7. RLS/WED diagnostic criteria

The diagnosis of RLS/WED was made using the criteria for definite RLS/WED in children recommended by the International Restless Legs Syndrome Study Group (IRLSSG) (Table 1) [15].

2.8. Comparison group

A comparison group included children from the same town and school, without RLS/WED and randomly matched by gender and age with the RLS/WED-affected individuals, pairing one by one.

2.9. Statistical analysis

For numerical variables, the descriptive statistics obtained were the following: sample size, mean, median, standard deviation, standard error of the mean, lower value, higher value and first and third quartiles. For categorical variables, frequencies and their percentages were obtained. The Student *t*-test was used to assess differences between independent samples, and, when the hypothesis of normality was rejected, we used the nonparametric Mann–Whitney *U* test. The significance level adopted was $p \leq 0.05$.

3. Results

Of 478 children enrolled and eligible for the study, we evaluated 383, representing a participation rate of 80.1%. In all, 95 of the 478 children did not participate in the study: six refused and 89 were not authorized by their parents or guardians (Fig. 1).

Individuals with RLS/WED had an average age of 11.5 years, with a standard deviation (SD) of 2.3 years and range of 7–15 years. This population comprised eight boys (33.3%) and 16 girls (66.6%); a total of 11 participants were white (45.8%) (Table 2). Individuals without RLS/WED had an average age of 9.9 years with an SD of 2.5 years and range of 5–16 years. This population comprised 183 boys (51%) and 176 girls (49%), 180 of whom were white (50.1%) (Table 2).

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