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Are lower urinary tract symptoms in children associated with urinary symptoms in their mothers?

Ariane S. Sampaio ^a, Luis Gustavo A. Fraga ^a, Bruno A. Salomão ^b,
 Júlia B. Oliveira ^b, Camila L. Seixas ^b, Maria Luiza Veiga ^a,
 José Murillo B. Netto ^b, Ubirajara Barroso ^a

^aCEDIMI (Center of Micturition Disturbance), Bahiana School of Medicine, Federal University of Bahia, Bahia, Brazil

^bFederal University of Juiz de Fora, SUPREMA, Minas Gerais, Brazil

Correspondence to: U. Barroso, Av. Alphaville 1, Rua Pajuçara, 335, Alphaville 1, 41701015, Salvador, Bahia, Brazil, Tel.: +55 71 21084670

ubarroso@uol.com.br
 (U. Barroso)

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Summary

Background

The association between parents who suffered daytime incontinence as children and children who are incontinence has been reported. However, the association of lower urinary tract (LUT) dysfunction in children and urinary symptoms in mothers has not been studied.

Objective

To test the hypothesis that the children of mothers with lower urinary tract symptoms (LUTS) are more likely to have urinary symptoms.

Study design

A cross-sectional multicenter study was conducted in two cities in Brazil. Children/adolescents of 5–17 years of age and their mothers were interviewed. Children with neurological problems, previously detected urinary tract abnormalities or who refused to sign the informed consent or assent form were excluded. The DVSS questionnaire was used to evaluate the presence of LUTS in the children and the ICIQ-OAB questionnaire was used to evaluate their mothers. Constipation in the children was investigated using the ROME III criteria.

Results

A total of 827 mother–child pairs were included, with 414 of the children (50.06%) being male. Mean

age was 9.1 ± 2.9 years for the children and 35.9 ± 6.5 years for the mothers. Urinary symptoms (occurring at least once or twice a week) were present in 315 children (38.1%), incontinence in 114 (13.8%) and urinary urgency in 141 (17%). Of the mothers, 378 (45.7%) had at least one LUTS, with 103 (12.5%) having incontinence and 153 (18.5%) urgency. According to the DVSS, the overall prevalence of LUT dysfunction was 9.1%. The children's DVSS scores were significantly associated with the mothers' ICIQ-OAB scores ($p < 0.0010$). Mothers with urinary symptoms were 2.5 times more likely to have a child with LUT dysfunction (95%CI: 1.52–4.17; $p < 0.001$), while mothers with overactive bladder were 2.8 times more likely to have a child with an overactive bladder (95%CI: 1.63–4.86; $p < 0.001$). In the multivariate analysis, these same characteristics were confirmed as independent predictive factors of the presence of LUT dysfunction in the child. Children of mothers with incontinence and urinary urgency were also more likely to have incontinence and urgency.

Conclusion

Mothers with typical symptoms of overactive bladder are more likely to have a child with LUT dysfunction. This correlation is also positive for the isolated symptoms of urinary urgency and incontinence. Independent predictive factors of the presence of LUT dysfunction in children were: being female, enuresis, constipation, and having a mother with LUTS.

Table Main findings of the study regarding the association between symptoms in mothers and their children

Variable	Child with Incontinence		Child with Urinary Urgency		p-value	OR	95%CI
	n	(%)	n	(%)			
Mother incontinent	26	(25.2)			0.000	2.4	1.49–4.02
Mother incontinent			30	(29.1)	0.000	2.3	1.43–3.60
Mother with urinary urgency	35	(22.9)			0.000	2.5	1.67–3.78
Mother with urinary urgency			45	(29.4)	0.000	2.2	1.41–3.44

Introduction

Lower urinary tract (LUT) dysfunction is characterized by a series of symptoms that include urgency, holding maneuvers, incontinence, altered frequency of voiding and difficulty in voiding [1]. It is considered idiopathic when unassociated with structural or neurogenic alterations of the lower urinary tract.

The presence of lower urinary tract symptoms (LUTS) accounts for up to 40% of visits to the pediatric urologist [2]. It may affect 2–25% of the population depending on the intensity of the symptoms evaluated [3,4]. Nevertheless, insufficient attention is paid by parents to daytime urinary complaints, with the principle motive for clinical visits still being the presence of repeated urinary infections or enuresis [5].

LUTS affect the lives of the children themselves and of their caregivers, resulting in poor self-esteem, social isolation and behavioral changes [6]. It is often silent and sometimes diagnosed after an underactive bladder has been present for a prolonged period of time, resulting at times in irreversible renal damage [7].

The causes of LUT dysfunction remain to be fully clarified and a possible role of family history in its etiology cannot be ignored. The association between parents who suffered enuresis as children and children who wet the bed has been firmly established in the literature [8]. Von Gontard et al. showed that the children of parents who had enuresis and daytime incontinence as children were also more likely to suffer daytime incontinence. Nevertheless, one of the limitations of that study was the need to rely on recall, since parents were asked about having LUTS as children, and this may have constituted an important bias. The objective of the present study was to test the hypothesis that the children of mothers with LUTS are more likely to have urinary symptoms.

Material and methods

This cross-sectional multicenter study was conducted in two Brazilian cities and consisted of simultaneous interviews with mothers and their children. Data collection was performed in public spaces (in public squares and at school gates) between May and July 2015 with children and adolescents of 5–17 years of age accompanied by their mothers. No effort was made to select any specific type of participant. Care was taken to choose data collection sites frequented by individuals of different socioeconomic levels. Individuals who happened to be at the data collection sites were approached and invited to participate in the study. The inclusion criteria were: children and adolescents of 5–17 years of age, the presence of a mother accompanying her son/daughter and willingness to sign the informed consent or assent form. Any children with neurological problems or previously detected urinary tract alterations were excluded from the study population. The patients were not remunerated for having answered the questions. The internal review boards of the participant institutions approved the study protocol under references CAEE: 41223514.3.0000.5577 and CAEE:543196.9.0000.5103.

Specific questionnaires were used to evaluate the presence of LUTS in the children and their mothers. Both the mothers and the children helped complete the Dysfunctional Voiding Scoring System (DVSS) questionnaire. The DVSS, translated and validated into Brazilian Portuguese, was used to evaluate the presence and severity of LUT dysfunction in the children [9,10]. This ten-question instrument containing nine items related to clinical symptoms and one item related to environmental factors (social and family problems) was answered by the children and their mothers. In the case of questions 1–9, the respondents assigned scores on a Likert-type scale that ranged from 0 to 3 according to the presence and severity of symptoms. For question 10, possible scores were 0 if there were no stress-related events or 3 if there were. A DVSS score ≥ 6 in girls or ≥ 9 in boys was indicative of LUT dysfunction. The presence of urinary symptoms occurring more than once or twice a week (a score of 2) was considered positive for each single question of the DVSS. Children experiencing urgency at least once or twice a week were considered to have an overactive bladder (OAB). When the mothers reported that the child tended to “hold in” urine with typical postures such as holding the genitals, crossing the legs, standing on tiptoe or squatting with the heel pressed into the perineum, this was considered confirmation of the presence of holding maneuvers.

The International Consultation on Incontinence Questionnaire – Overactive Bladder (ICIQ-OAB), validated for use in Brazilian Portuguese, was used to evaluate the presence of LUTS in the mothers [11]. This questionnaire consists of four questions regarding daytime and nighttime urinary frequency, the presence of urinary urgency and incontinence. Responses are scored from 0 to 4 on a Likert-type scale based on the presence and severity of the symptoms. The frequency of urinary urgency and incontinence symptoms was classified as never, seldom, sometimes, mostly or always. Mothers who had symptoms at least “sometimes” (a score of 2) in the preceding month were considered to have urinary urgency and incontinence, while nocturia was defined as voiding at least twice at night (a score of 2) and increased daytime voiding was defined as those reporting > 9 voids/day (a score of 2). Women with nocturia and/or urgency and/or incontinence and/or increased daytime voiding were considered to have LUTS. Women reporting symptoms of urinary urgency in the preceding four weeks were considered to have an overactive bladder.

The validated ROME III questionnaire for children of 4–18 years of age was used to evaluate the presence of constipation, with positive answers to at least two of the six questions constituting the cut-off point [12].

Statistical analysis

The SPSS software program, version 20.0 was used for the statistical analysis. The numerical variables representing age and scores were expressed as means and standard deviations or medians and interquartile ranges (IQR). The variables included in the analysis were: the children’s age, sex, data on the presence of enuresis, the DVSS and ROME III scores; and the mothers’ score in the overactive bladder questionnaire (ICIQ-OAB). For the purposes of analysis, the children’s age was dichotomized into ≤ 9 years of age or ≥ 10 years of age.

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