

# Comparative analysis of the frequency of lower urinary tract dysfunction among institutionalised and non-institutionalised children

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## OBJECTIVES

To evaluate the level of symptoms of lower urinary tract dysfunction (LUTD) in orphans in institutions, and compare these data with schoolchildren of the same age group who were not institutionalised, as LUTD in children is related to factors such as social isolation and low self-esteem, with other psychological changes also being cited, although it is unknown whether these problems are primary or secondary to the symptoms of LUTD.

## PATIENTS AND METHODS

Children institutionalised in orphanages with no parental presence and who are isolated from a family environment are probably more sensitive to psychological disturbances.

Psychological changes have been associated with symptoms of urgency and urinary incontinence. Thus 89 orphans were compared with 143 schoolchildren not in institutions. A questionnaire was devised and completed by the care-taking staff in the orphanage, while for the schoolchildren the parents completed the questionnaire. The mean age in the institutionalised children was 7.9 years and that of the control group 7.8 years ( $P=0.32$ ). Thirty-nine (44%) of the orphans were boys, vs 74 (54%) of the control group ( $P=0.17$ ).

## RESULTS

The incidence of urgency, diurnal urinary incontinence, nocturnal enuresis and

constipation in the orphans and in the control group were: 45 (51%) and 57 (40) ( $P=0.17$ ), 36 (40%) and 19 (13%) ( $P<0.001$ ), 39 (47%) and 38 (27%) ( $P=0.002$ ), and 27 (30%) and 43 (30%) ( $P=0.76$ ), respectively.

## CONCLUSION

Children living in orphanages have a significantly higher level of diurnal urinary incontinence and nocturnal enuresis than those not in an institution.

## KEYWORDS

bladder, children, dysfunction, neurogenic bladder, orphanage, incontinence

## INTRODUCTION

Lower urinary tract dysfunction (LUTD) is clinically characterized by frequency and urgency or by infrequent voiding when the child has already completed toilet training, in the absence of neurological findings. It is an important clinical entity that is currently recognized as being a major cause of UTI in older children, for its association with VUR and as a risk factor for kidney scarring and arterial hypertension [1–3].

LUTD in children is related to psychological problems, social isolation and low self-esteem [4]. Nevertheless, it is still controversial in published studies whether these problems are primary or secondary to the symptoms of LUTD. Kolvin and Taunch [5] suggested that the cause of primary enuresis is principally biological, while the causes of secondary enuresis are largely psychosocial. Nevertheless, Van Gool *et al.* [6] showed that not all children with LUTD

had psychological disturbances. They further found that not every child influenced by such factors as divorce, parental death or sexual abuse had LUTD.

Children institutionalised in orphanages with no parental presence and who are isolated from a family environment are probably more sensitive to psychological disturbances. If psychological problems originate from LUTD, children who live in orphanages would have a rate of LUTD symptoms similar to children not in an institution. The aim of the present study was to compare the LUTD symptom level in orphan children with those in individuals of the same age group from a public school population.

## PATIENTS AND METHODS

A questionnaire was given to parents of public school children and to caretaker staff of an

orphanage. Urinary symptoms such as urgency, daytime urinary incontinence (UI), bedwetting and constipation were evaluated. The symptoms defined were: urgency a strong desire to urinate accompanied by fear of leakage; daytime UI, the presence of urinary leakage due to an inability to hold urine; and constipation, a difficult, incomplete, or infrequent evacuation of dry, hard faeces. The data were collected by directly questioning the adults, to avoid any type of negative reaction in the children. To avoid interference in the sampling on the level of social or economic class, it was defined that the non-institutional group would be from public schools; this sampling definition equalises the comparison to the orphan group. In December 2003 a random questionnaire was administered to the parents of students from a metropolitan public school. This period was chosen because it coincided with the enrolment period of these schools. In all, 143 questionnaires were given to this group. In

March 2004, 89 questionnaires were administered to the caretakers of orphaned children in the same metropolitan area. Children with any type of previous neurological problem, e.g. seizures, physical or mental impairment, or a history of neurological or psychiatric treatment, were excluded from the study. The results were compared statistically using chi-squared tests for proportions and *t*-tests for mean difference, with  $P < 0.05$  considered to indicate significant differences.

## RESULTS

There were 39 boys and 50 girls (aged 4–11 years) in the institutional group, and 74 boys and 50 girls aged 4–11 years in the control group. There was no statistical difference in sex distribution ( $P = 0.32$ ) or age between the groups ( $P = 0.17$ ). The number of children with urgency, daytime UI, bedwetting and constipation is listed in Table 1; there was a significant difference between daytime UI and bedwetting between the groups.

## DISCUSSION

The causes of LUTD remain unclear; psychological changes and social stress are suggested in some studies as being a possible cause of UI [7–9]. There are also studies showing that psychological problems are secondary consequences of LUTD symptoms [10]. Lettgen *et al.* [11] showed that children with LUTD who have short dry periods (<1 month), with no diurnal UI and bedwetting, have a greater risk of developing psychiatric problems.

It is fairly common, principally in more severe cases, to have an association of LUTD with psychological problems and family conflict. The parents, principally the father, tend to be intolerant and dominating. Divorce and alcoholism exacerbate the environment of conflict. The children are sometimes punished verbally and physically. From this can follow confusion, low self-esteem and depression, generated by fear of urinating in their clothing. Institutionalised children residing in orphanages can also have psychological problems; they have no family environment, with no parents because of either death or abandonment, and further have suffered profound social stress. From a psychological perspective, these children are more sensitive to all types of disturbances. As documented

Symptom	Institutional, n (%)	Not institutional, n (%)	P
Urinary urgency	45 (51)	57 (40)	0.17
Urge UI	36 (40)	19 (13)	<0.001
Nocturnal enuresis	39 (47)	38 (27)	0.002
Constipation	27 (30)	43 (30)	0.76

TABLE 1

The rate of LUTS in the two groups of children

by Frank *et al.* [12], children in institutional care are extremely vulnerable to psychological problems. Orphanages put young children at greater risk of delayed language development and other developmental problems [13]. Children raised in institutions (compared to children raised by families) have lower intelligence quotient scores, difficulties forming and maintaining relationships with others, and poor self-esteem [13]. Also, in orphanages there are several problems related to staffing, including limited training and lack of appropriate supervision. If psychological distress was secondary to bladder dysfunction a similar rate of UI might be expected in orphans and schoolchildren. There was a higher rate of daytime UI (40% vs 13%,  $P < 0.001$ ) and of bedwetting (47% vs 27%,  $P = 0.002$ ) in the present institutional children living in orphanages, but no statistical difference in urgency between the groups, at 51% and 40% ( $P = 0.17$ ).

Constipation has been associated with bladder dysfunction; Schopfner [14] noted that constipation was associated with reflux, hydronephrosis, enuresis and urinary infection, a correlation also reported by Koff *et al.* [15]. On this basis, we included in the questionnaire an investigation of evacuation disturbances; there was no statistical difference between the groups (30% in both groups,  $P = 0.76$ ; Table 1). Because daytime UI was more prevalent in the institutionalised children we expected a higher frequency of evacuation problems in this group, but this was not so. As faecal elimination problems are not easily obtained from the clinical history, and because the questionnaires were addressed to the caretakers in the institutional group, the real incidence might have been underestimated.

The present results show that children living in orphanages have a greater rate of daytime and night-time UI. The data suggest that the environment and the psycho-social living situation have a striking effect on LUT function. Andersson [16] cited the relationship between depression and detrusor

overactivity, where a deficiency in serotonin (5-hydroxytryptamine) and its metabolism could be associated with LUTD. He also suggested that the administration of selective serotonin reuptake inhibitors in patients with no UI could, in turn, cause UI, especially in children.

In conclusion, children who live in orphanages have a significantly higher level of diurnal and nocturnal UI than those not in institutions. To our knowledge, this is the first study to provide epidemiological data on the symptoms of LUTD in institutionalised children who live in orphanages.

## CONFLICT OF INTEREST

None declared.

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- Abbreviations:** LUTD, lower urinary tract dysfunction; UI, urinary incontinence

#### APPENDIX

The questionnaire (translated from Portuguese)

1. Name:
2. Date birth:
3. Institution:
4. Date of the first day in the institution:
5. Gender: 1. ( ) Male 2. ( ) Female
6. Does the child hurry to the toilet in fear of wetting his/her pants (leakage)? 1. ( ) No. 2. ( ) Yes
7. The child occasionally wets his/her pants during the day? 1. ( ) No. 2. ( ) Yes
8. If the last answer was yes, How many times does this occur? 1. ( ) Every day 2. ( ) 2–3 times/week 3. ( ) less times than 2–3 times/week
9. Does the child urinate while sleeping (bedwetting)? 1. ( ) No. 2. ( ) Yes
10. If the last answer was yes, How many times does this occur? 1. ( ) Every day 2. ( ) 2–3 times/week 3. ( ) less times than 2–3 times/week
11. Does the child have hard, dry bowel movements? 1. ( ) No. 2. ( ) Yes
12. Does the child have a history of urinary infection? 1. ( ) No. 2. ( ) Yes
13. Does the child have any neurological or psychiatric problems, such as seizures, physical or mental impairment? 1. ( ) No. 2. ( ) Yes 3. ( ) I do not know
14. Has the child have ever visited a neurologist or psychiatrist? 1. ( ) No. 2. ( ) Yes 3. ( ) The visits are part of institutional policy