

Prevalence and risk factors for childhood nocturnal enuresis

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Abstract

A large population based study was carried out to describe the epidemiology of nocturnal enuresis and to outline medical management of the problem. Parents of 1,806 schoolchildren were surveyed and prevalence was ascertained at 13% with two thirds classified as primary enuretics. Significant associated factors included social class, unemployment, family stress and a parental family history of enuresis. Enuretics were more likely to be behind at school, have behavioural problems, soiling and daytime wetting.

Enuresis was distressful for the family yet most children never saw a doctor about the problem. In those that did, less than two thirds had a urine test and 40% of parents remained dissatisfied with the outcome of the visit to the doctor. Children were more likely to be prescribed medicine than other treatments whereas the enuresis alarm was recommended for only one in ten children.

These findings illustrate that nocturnal enuresis continues to be a problem, that the characteristics of Irish enuretics differ from those in other countries and that medical management of enuresis has room for improvement.

Introduction

Childhood nocturnal enuresis is an important social problem and one of the most common and harassing conditions of childhood; prevalence rates range from one to 40% depending on the characteristics of the population studied and how the author defined enuresis.¹ Enuresis is generally more common among boys than girls¹ and has been associated with a wide variety of disorders in the child^{2,5} and social and environmental factors in the family,^{3,6} but many of these studies are dated and may not reflect the present situation.

Treatment consists of pharmacotherapy or behavioural therapy including the enuresis alarm. Pharmacotherapy is less effective in achieving long term cure.^{7,9} Tricyclic agents have many undesirable side effects,^{10,11} and are the commonest cause of fatal accidental overdosage in young children,¹² yet in the United States they are the most frequently recommended treatment for enuresis.¹³

This study aims to determine prevalence of enuresis in schoolchildren and to identify risk factors for enuresis in the Irish setting. It describes the impact of bed-wetting on the family, current management of the problem and satisfaction with medical management.

Materials and Methods

A large population based sample of school children was obtained via cluster sampling of national primary schools in Kildare, Six schools were surveyed and judged to be representative of the total primary school population. A total of 1,806 children aged between four and 14 years were covered by the survey.

Information on (i) sociodemographic data (ii) enuresis data (iii) physical/psychological disorders and (iv) family stress was obtained from a self administered questionnaire given to parents. Social class was based on an ordinal scale as described previously.¹⁴ A comparison was made of these variables between enuretic and non-enuretic families so that risk factors for enuresis could be identified.

A pilot study on 70 school children resulted in minor refinements to the questionnaire and data from the pilot study was not included in the final analysis. Enuresis was defined as

involuntary urination during sleep, occurring at least once a month in children over four years of age. The enuresis battery included questions on frequency of wet nights, classification, perceived impact on the family and current management.

A random sample of non responders was contacted to ascertain if they differed significantly from those who responded to the questionnaire and statistical analysis was performed with the X² test.

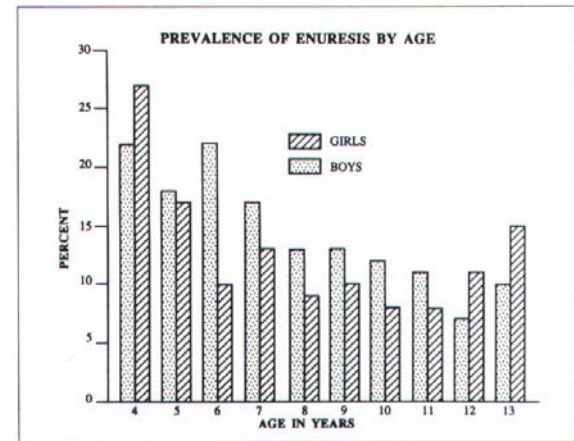


Figure 1

Results

Of the 1,806 respondents in the study, the questionnaire was completed by 1,746. A further 14 non responders were contacted yielding an overall response rate of 98% and these non responders did not differ from those who initially responded to the questionnaire.

Prevalence - Overall prevalence was determined at 13% and reduced with increasing age (Fig. 1). Bed-wetting was more prevalent among boys than girls (15% and 12% respectively) but the difference was not significant.

The severity of enuresis was graded and is outlined in table

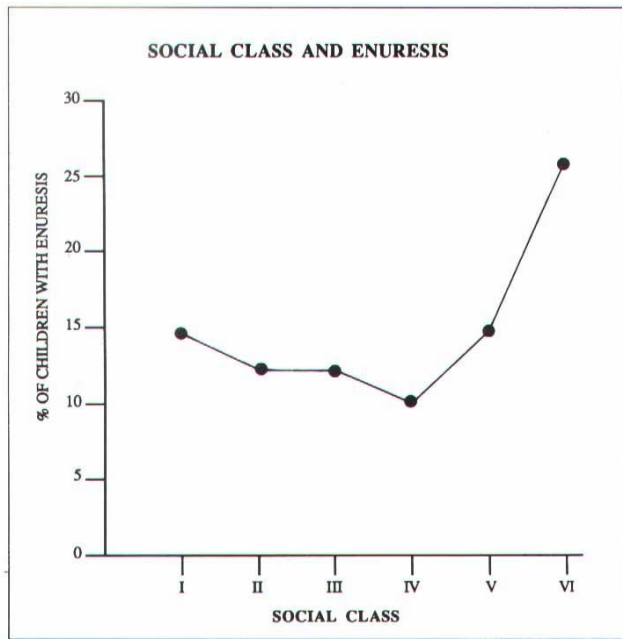


Figure 2

1. If enuresis is defined more conservatively - wetting at least once a week, then overall prevalence reduced from 13% to 9%. Enuresis was also classified as primary, where the child never acquired nocturnal continence, and secondary where the child was reliably dry at night for at least six months then started wetting again and the breakdown of the classification was 71% and 29% respectively.

Table 1 - Severity of Enuresis

Frequency of wet nights	Entireties (%)
1/month to < 1/week	77 (33)
1/week	25 (11)
2-4/week	57 (25)
5-7/week	71 (31)

Environmental factors - Social class was found to be associated with enuresis (fig 2), tending to follow a J shaped distribution. Fathers of enuretic children (19%) were more likely to be unemployed than fathers of non enuretic children (12%), ($\chi^2 = 7.7, p < 0.01$), but the mother's employment status was not associated with enuresis.

Table 2 - Psychological disorders and enuresis

Variable	Enuretic (%)	Non-Enuretic (%)
Daytime wetting	39 (17)	60 (04)*
Soiling	20 (09)	59 (04)*
Child guidance clinic	17 (08)	52 (03)*
Behavioural problem	18 (08)	44 (03)*
Poor school performance	23 (10)	69 (05)*
Early childhood Stress	67 (30)	309 (20)*

*= $p < 0.01$

Place of residence (urban/rural), adverse housing and family size were not associated with enuresis. The child's birth order was significant with almost half of the enuretics coming from the middle of the family whereas, in contrast, the birth order distribution of non-enuretics was more even. Twenty percent of enuretic families admitted to stress in the family compared to 10% of non-enuretic families ($\chi^2 = 20.4, p < 0.01$). In order of decreasing frequency such stress included financial difficulties (36%), marital problems (27%), serious illness

(17%), unemployment (7%), death in the family (5%) and other family disharmony (8%). A positive parental family history of enuresis represented the strongest association with 41% of enuretics having such a history compared to only 9% of non-enuretics ($\chi^2 = 180, p < 0.01$).

Disorders in the child - Enuretics were more likely to have a previous history of a stressful event in early childhood (table 2). Such events included admission to hospital (72%), serious accident (14%), severe physical illness (11%) and other causes such as death in the family and psychiatric illness (3%).

Enuresis was strongly associated with behavioural disorders and poor school performance (table 2). An interesting finding on subgroup analysis was the absence of an association between enuresis and soiling, behavioural problems and poor school performance in girls 10 years or older.

Concern about enuresis - Parents were asked to grade their concern about their child's enuresis and how much distress it caused the child. Table 3 indicates that parents were relatively more concerned about the bed-wetting than the child. Further analysis revealed that older children were more distressed about the problem and at all ages, girls were more distressed than boys.

Table 3 - Concern about Enuresis

	Parental concern (%)	Child distress (%)
None at all	39 (25)	76 (33)
A little	90 (39)	88 (38)
Some	27 (12)	28 (12)
A great deal	55 (24)	38 (17)

Management of Enuresis - Only 43% of parents consulted a doctor about their child's bed-wetting. This was more likely in older children and 56% of the 10 year olds or greater made a visit. Just over half the girls consulted the doctor compared to one third of boys. In those children that did visit the doctor, only 64% had their urine tested.

Table 4 - Treatment Prescribed

Treatment	Enuretics No (%)
Medicine	42 (21)
Enuresis alarm	12 (06)
Star chart	34 (17)
Counselling	20 (10)
Med. + Star	8 (04)
Med. + Counselling	2 (01)
Star + Counselling	2 (01)
Star + Alarm	6 (03)
Med. + Alarm + Star	4 (02)
Nothing	71 (35)
Total	201 (100)

Parents were then asked to list the treatment recommended (table 4). Overall 28% of enuretic children were prescribed medicine either alone or in combination, whereas only 11 % were recommended to use the enuresis alarm and surprisingly 35% of parents perceived that the doctor did nothing about the problem. Finally not all families who consulted the doctor were satisfied with the outcome of the visit and 40% of parents remained dissatisfied with management of the bed-wetting.

Discussion

Many of the studies describing the epidemiology of enuresis have not been measured in a sample representative of the general population.^{2,3,13,15} This was a large population based

study and the selection of a control group eliminated a potential source of bias. The high response rate (98%) to the questionnaire was important in maintaining a sample representative of all school children.

In the study, 13% of school children had wet the bed during the previous month, however a more conservative definition of enuresis (wetting at least once a week), reduced prevalence to 9%. Prevalence decreased with increasing age (Fig 1) but these figures are generally higher than similar studies in other countries' and highlights that enuresis continues to be a common problem today.

From the literature, enuresis is not considered solely a disease entity with a single factor accounting for all cases and a number of environmental factors and disorders in the child may operate.¹⁶ Enuretic children were more likely to come from families where the father was unemployed and there was ongoing stress such as marital disorders, financial hardship and recent death in the family. The J shaped relationship between social class and enuresis and the association with adverse environmental factors has also been noted.^{3,4,6,17}

A stressful event in early childhood was found to be significant in the later development of enuresis, similar to findings by Douglas¹⁸ who noted that even if the environmental stress was transient, this could interfere with the later emergence of dryness. However even though enuresis was associated with certain unfavourable environmental factors, in the Irish setting most enuretic children come from family backgrounds with little or no stress.

In comparison with other studies,^{3,19} enuresis was strongly associated with psychological conditions in the child such as soiling, daytime wetting, behavioural problems and poor school performance. An interesting finding on subgroup analysis was that these variables lost their significance in older girls. Prior to this, Rutter⁴ had suggested that there were two types of enuretic; the first more common in younger "normal" boys and the second variety involving behavioural disturbance and relatively more common in older girls. This did not hold true in the Irish setting and indeed the reverse appeared to be the case. At all ages these psychological variables were more common in enuretic boys, while soiling lost its significance in older children and behavioural problems, prior attendance at the child guidance clinic and poor school performance were not associated with enuresis in older girls.

A positive family history of enuresis represented the strongest association between enuresis and any one variable; similar to other reported figures and in keeping with the tendency that enuresis runs in families although the mode of transmission is not clear.²⁰ Bed-wetting is essentially a benign condition although it may cause a considerable amount of distress for the child and worry for the parents. In this population, girls were more distressed than boys and parents more concerned about the problem than their children. Parents who were concerned were more likely to seek medical advice. As expected, the older the child, or if the child was female, the more likely the family was to seek advice. In those children that did visit the doctor less than two thirds had their urine tested, a necessary requirement to rule out urological abnormality.^{21,22}

The most frequently prescribed treatment was medicine whereas only one in 10 were advised to use the enuresis alarm. Yet for the past 15 years many authors recommend that drugs should not be the therapy of first choice because of poor long term cure rates, detrimental side effects and in particular the danger of fatal accidental overdosage in children,^{12,13,23,26}

Of interest was that more than one third of parents felt that the doctor did nothing about the bed wetting. This is remarkable because it is unlikely the doctor actually did nothing and probably at least offered some counselling but parents did not perceive this as such and this may in part explain the high level (40%) of dissatisfaction with the

doctor's management of enuresis.

These findings indicate that enuresis is a very common problem and that the characteristics of Irish children who wet the bed differ from those in other countries. Enuresis can be very distressful for parents and their children yet management of this common problem is often unsatisfactory and could be improved.

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