

## CLINICAL INVESTIGATIONS

# Frequency of Enuresis, Constipation and Enuresis Association with Constipation in a Group of School Children Aged 5-9 Years in Malatya, Turkey

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**Abstract:** The aim of this study was to determine the frequency of enuresis, constipation and enuresis associated with constipation in school children aged 5-9 years living in Malatya Municipality, Turkey.

This is a descriptive cross-sectional study. All elementary schools in Malatya Municipality with kindergarten and preparatory classes took part in the study. All parents of the children aged 5-9 years enrolled in these schools were given a questionnaire. Completion of the questionnaire was voluntary. Of the parents, 1377 completed the questionnaire and these were evaluated.

Overall enuresis frequency was 9.5%. Enuresis frequency was significantly higher among boys (11.2%) compared to girls (7.7%) ( $P < 0.05$ ). Among children aged 9 years, enuresis frequency (3.9%) was significantly lower than in younger age groups ( $P < 0.05$ ). The frequency of constipation was 12.4%. The frequency of the association of enuresis with constipation was 21.6%.

The frequency of enuresis in Malatya is similar to that in the literature. It was found that about 1 in 4 enuretic children had constipation, and so seeking a constipation history in enuretic children is strongly suggested.

**Key Words:** Enuresis, constipation, prevalence, children

## Introduction

Enuresis is an important childhood problem that has been associated with a wide variety of child disorders, and with the socio-environment of the family (1). The frequency of enuresis changes with age and its prevalence ranges widely in various countries (1-7). Blomfield and Douglas studied 5386 six-year-old children in Edinburgh, Scotland, and found daytime wetting in 1.8% of males and 4.1% of females (3). In a study by Hellström et al. of 3556 seven-year-old children in Sweden, day-time wetting was found in 6% of females and 3.8% of males and nocturnal enuresis was found in 7% of females and 12% of males (4). Bloom et al. found diurnal enuresis rates of 10%, 5%, 10% and 4% in 6, 7, 8 and 9 year-old children, respectively (8). Enuresis is generally more common among boys than girls (2,5,6). Although the

etiology of enuresis in children may vary, congenital abnormalities and acquired disorders like infections or neurologic disorders are known to cause enuresis (7-9,10). Constipation is one of the multiple factors that cause enuresis (11-16).

This study aims to determine the frequency of enuresis, constipation and enuresis associated with constipation in school children aged 5-9 years in Malatya Municipality.

## Materials and Methods

**Study population:** The population studied were all children aged 5-9 who were enrolled at elementary schools with kindergarten or preparatory classes in Malatya Municipality. Without prior sampling, 8 schools

with kindergarten or preparatory classes having 1500 students were selected.

**Data collection:** Data collection was done in 2 stages. A questionnaire including items about sociodemographic characteristics, total enuresis, and constipation was constructed and data on these items were gathered in the first stage. Data collection was done in cooperation with teachers. Teachers distributed the questionnaires to those parents willing to participate. We received 1377 questionnaires that had been completed by parents. Thus, the response rate was 91.8%. In the second stage, enuretic children's parents were interviewed on the frequency of enuresis during the day and night, the presence of primary or secondary enuresis and their family history.

**Data analysis:** Enuresis was defined as an unintended leakage of urine at least once a week in an individual (a child who is older than 4 years) old enough to maintain bladder control (10). Diurnal enuresis was defined as an unintended leakage of urine during waking hours and nocturnal enuresis was defined as bed-wetting in children older than 4 years at least once a week.

Primary enuresis was defined as an unintended leakage of urine at least once a week in a child who had never had day or night bladder control for a period greater than 6 months. Secondary enuresis is considered when the child has been toilet trained for at least 6 months after the age of bladder control, and bladder control is subsequently lost (17).

Constipation was defined simply as a delay (defecation frequency is 1 stool per day at 4 years and more than 4 years of age) or the difficult passage of hard, dry, unusually large or difficult to pass stools in defecation, present for 2 or more weeks (18).

Data analysis were performed using SPSS statistical software (SPSS for Windows, Chicago, IL, USA). The chi-square test was used for statistical analysis. A level of  $P \leq 0.05$  was considered statistically significant.

**Limitations:** The results of this study cannot be generalized to all children aged 5-9 years living in Malatya Municipality because the survey was based on the voluntary completion of the questionnaire by parents and only schools with kindergarten and preparatory classes were selected. The findings represent only those peculiar to the participants of this study.

## Results

The overall frequency of enuresis among the children studied was 9.5%. Diurnal and nocturnal enuresis frequencies among all studied children were 4.3% and 5.2%, respectively. The distribution of enuresis by sociodemographic characteristics is presented in Table 1. Enuresis frequency was significantly higher among boys (11.2%) than girls (7.7%) ( $P < 0.05$ ). Among children aged 9 years, enuresis frequency (3.9%) was significantly lower than in younger age groups ( $P < 0.05$ ). In Figure 1, the frequency of enuresis by sex and age is presented. Enuresis frequency did not differ significantly according to the economic status of the family and mother's education level (Table 1).

Of the 131 enuretic children, 72 (55.0%) had nocturnal and 59 (45.0%) had diurnal enuresis. Enuresis was primary in 57.3% and family history was positive in 63.4% of enuretic children. The distribution of diurnal and nocturnal enuresis by some individual properties is presented in Table 2. The frequency of nocturnal and diurnal enuresis did not differ significantly with sex, although nocturnal enuresis was higher in boys, and diurnal enuresis was higher in girls ( $P > 0.05$ ). Primary enuresis was detected in 61.1% of nocturnal and in 52.5% of diurnal enuretic children; this was not statistically significant ( $P > 0.05$ ). Positive family history was more frequent among nocturnal enuretic children (73.6%) than diurnal enuretic children (50.8%) ( $P < 0.05$ ).

The frequency of constipation was 12.4%. The distribution of constipation by sociodemographic characteristics is presented in Table 3. Constipation prevalence was significantly higher in the 5 and 6 year age groups compared to the older age groups ( $P < 0.05$ ). No significant differences were determined for sex, mother's education and economic status of the family in terms of constipation.

Of the 171 constipated children, 37 were also enuretic. Thus, enuresis frequency in association with constipation was 21.6% (Table 4). Enuresis frequency was significantly higher among constipated children compared to non-constipated children (7.8%) ( $P < 0.05$ ). Of the 171 constipated children, 4 had stool incontinence and enuresis. The percentage distribution of children with enuresis, enuresis associated with constipation, constipation and other children is presented in Figure 2.

Table 1. Distribution of enuresis by sociodemographic characteristics.

Sociodemographic characteristics	Enuretic		Non-enuretic		Total N
	N	%	N	%	
Sex*	79	11.2	624	88.8	703
Male	52	7.7	622	92.3	674
Female					
Age*					
5 years	7	14.6	41	85.4	48
6 years	5	9.3	49	90.7	54
7 years	57	11.5	438	88.5	495
8 years	55	9.1	547	90.9	602
9 years	7	3.9	171	96.1	178
Mother's education					
Illiterate or primary incomplete	9	11.4	70	88.6	79
Primary complete	95	10.3	824	89.7	919
Secondary complete	16	9.5	153	90.5	169
High school or higher education	11	5.2	199	94.8	210
Self-reported economic status of family					
Poor	8	6.6	113	93.4	121
Middle	120	10.0	1077	90.0	1197
Good	3	5.1	56	94.9	59
Total	131	9.5	1246	90.5	1377

\* P &lt; 0.05, chi-square test

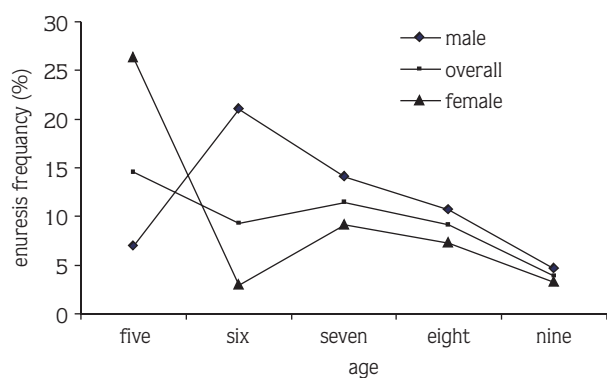


Figure 1. Frequency of enuresis according to age groups.

## Discussion

Enuresis is an important psychosocial and medical problem. In our study, enuresis frequency is 11.2% in males and 7.7% in females and the overall frequency is 9.5%. The frequency difference in males and females was significant. A study from Aydın, Turkey, found higher enuresis frequency in boys at every age except 6 years (2). Gümüş et al. studied 1703 children aged 7-11 in

Manisa, Turkey, and found an enuresis prevalence of 16.3% in males and of 10.6% in females and of 13.7% for all children (5). In Saudi Arabia, the overall frequency of enuresis has been reported as 15% between 6 and 16 years (6).

It is known that age is a significant factor associated with the frequency of enuresis. Regarding age, a significant parallel decrease in enuresis frequency as age increased was not determined in our study, but there was a reducing tendency with age and it was significantly lower in children aged 9 years compared to younger children.

Although in preceding studies the frequency of enuresis had been found higher in the children of families of lower socioeconomic status (1,2), we did not find any association of enuresis with family economic status or the mother's education level.

The frequencies of enuresis nocturna and diurna were 5.2 and 4.3%, respectively, in our study. Enuresis was primary in 61.1% of nocturnal enuretic children. Öge et al. found the prevalence of enuresis nocturna and diurna to be 11.6% and 0.8%, respectively, among 4-12-year-

Table 2. Distribution of diurnal and nocturnal enuresis by some individual properties.

Individual properties	Diurnal Enuresis		Nocturnal Enuresis		Total Enuresis	
	N	%	N	%	N	%
Gender						
Male	31	52.5	48	66.7	79	60.3
Female	28	47.5	24	33.3	52	39.7
Type						
Primary	31	52.5	44	61.1	75	57.3
Secondary	28	47.5	28	38.9	56	42.7
Family history*						
Positive	30	50.8	53	73.6	83	63.4
Negative	29	49.2	19	26.4	48	36.6
Total	59	100.0	72	100.0	131	100.0

\* P < 0.05, chi-square test

Table 3. Distribution of constipation by sociodemographic characteristics.

Sociodemographic characteristics	Constipated		Non-constipated		Total N
	N	%	N	%	
Sex					
Male	91	12.9	612	87.1	703
Female	80	11.9	594	88.1	674
Age*					
5 years	17	35.4	31	64.6	48
6 years	12	22.2	42	77.8	54
7 years	62	12.5	433	87.5	495
8 years	63	10.5	539	89.5	602
9 years	17	9.6	161	90.4	178
Mother's education					
Illiterate or primary incomplete	12	15.2	67	84.8	79
Primary complete	118	12.8	801	87.2	919
Secondary complete	17	10.1	152	89.9	169
High school or higher education	24	11.4	186	88.6	210
Self-reported economic status of family					
Poor	13	10.7	108	89.3	121
Middle	152	12.7	1045	87.3	1197
Good	6	10.2	53	89.8	59
Total	171	12.4	1206	87.6	1377

\* P < 0.05, chi-square test

Table 4. Distribution of children by enuresis and constipation status.

Constipation	Enuresis				Total	
	Enuretic		Non-enuretic			
	N	%	N	%	N	%*
Constipated	37	21.6	134	78.4	171	12.4
Non-constipated	94	7.8	1112	92.2	1206	87.6
Total	131	9.5	1246	90.5	1377	100.0

P < 0.05, chi-square test

\* Column percent, others were row percent.

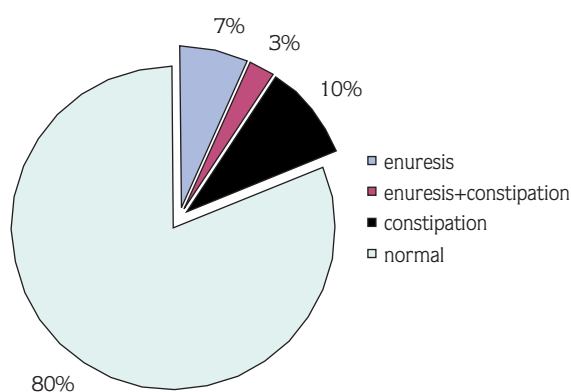


Figure 2. Percentage distribution of children with enuresis, enuresis + constipation, constipation, and other children.

old children. In their study, enuresis nocturna was primary in 87% of cases (2). Family history was positive in 63.4% of enuretic children in our study and it was significantly higher among nocturnal enuretic children (73.6%) compared to diurnal enuretics (50.8%). In the Gümü? et al. study, a history of enuresis was found in 76.5% of enuretic children's families, and in Öge et al. positive family history among enuretics was 40.5%.

Constipation and encopresis are common problems in children (14). Chronic constipation accounts for 3% to 5% of pediatric primary care outpatient visits (19). In a study of healthy children, constipation was found in 16% of 22-month-old children; when the children were 40 months old constipation decreased to 3% (20). In our study, the frequency of constipated children was higher (12.4%) compared to the literature. The reason could be our choice of constipation measurement. Enuresis is often

related to encopresis and constipation. Studies of encopretic patients show that enuresis is an associated problem in more than 30% (12); in encopretic children the incidence of enuresis has been found as high as 50.4% (15). The frequency of enuresis among constipated children was 21.6% in our study. Four of the constipated children had encopresis due to chronic constipation and all of these children were enuretic. The mechanism by which constipation leads to enuresis is not clear, but a possible explanation is the pressure effect of a stool during descent or the sigmoid colon triggering an uninhibited contraction of the detrussor (16). Finally, the detection of constipation in enuretic children is very important because enuresis can be treated by constipation treatment without extensive urologic evaluation.

In conclusion, the frequency of enuresis among children aged 5-9 years in Malatya Municipality was similar to that of the literature. The study showed that about 1 in 4 enuretic children also suffered from constipation, and so seeking a constipation history for enuretic children is strongly suggested.

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