

Nocturnal Enuresis in Children in The Mountain and Coastal Area

T Erna Lisma, Ani Ariani, Tiangsa Sembiring, Rafita Ramayati, Rusdidjas

(Department of Child Health, Medical School University of North Sumatera/Adam Malik Hospital, Medan)

ABSTRACT This study was designed to assess whether there is the difference of prevalence nocturnal enuresis of children living in the mountain and coastal area, the role of socioeconomic status and nocturnal enuresis and attitude of parent concerning to enuretic children. The cross sectional study was conducted from September to October 1995 in Brastagi (mountain area) and Pantai Cermin (coastal area). Sample was taken by simple random sampling method from children with age of 5 to 15 year. Data were collected by filling the questionnaires, physical and urine examination. Nocturnal enuresis were found 19.27% of 578 children in Brastagi and 18.46% of 547 children in Pantai Cermin, it was not significant difference statistically ($p > 0.05$). In age group of 5 to 6 years enuresis were the highest percentage namely 30.26% in Brastagi and 30.01% in Pantai Cermin. Poor social economic status of nocturnal enuretic children family 57.02% in Brastagi and 50.50% in Pantai Cermin, it was not significant difference ($p > 0.05$). Only 55.36% of the parents concern with enuresis on their children, while in Pantai Cermin 23.95%. In this study, we did not find the correlation between geography, poor social economic status with nocturnal enuresis and mostly of the parents considered that enuresis was not a problem. [Paediatr Indones 1999; 39:76-82]

Introduction

Enuresis is rooted from a Greek language, *enourein*, meaning "to void urine". Enuresis is an involuntary urination occurring repeatedly in the age group of more than 5 years with a minimal frequency of 2 times monthly without organic abnormalities and urinary disturbances.^{1,2} Based on the incidence, enuresis is defined primary when the

child never experiences bed drying because nocturnal enuresis always occurs. Enuresis is defined secondary when the child still has enuresis after the child had previously no enuresis for 6-12 month.³⁻⁶ Based on the time of occurrence, enuresis is defined diurnal when it occurs in the day time, and nocturnal when in the night.^{1,7} It is generally accepted that nocturnal enuresis occurs in 15% to 20% of 5 year old children, 5% in 10 years, and 1% in 15 years.^{1,8-11} There is no report yet about nocturnal enuresis of the children living in the mountain area and sea shore area. In hot weather the amount of water lost from the skin may be greatly increased and the volume of urine tends to be reduced. The other way, in cold weather the volume of urine tends to be increased, so that water balance is maintained.¹²

Enuresis tends to be more frequent in boys than in girls, in poor socioeconomic group, the incidence is higher.^{1,8-11} The prevalence of enuresis will reduce by it self with the increase in age of the child. If enuresis becomes permanent to the adult life, it will cause neurosis.^{7,10} Enuresis is a problem often discussed and there are various opinions in its incidence and management. Various discipline of science are involved in the management, depending on what point it is viewed, whether psychosocial, urologic or educational.^{1,7} In general population, especially in mothers, enuresis often results in confusion and restlessness among the parents and their children. However, there are still many parents who let this condition without trying to have a consultation with a physician.^{3,8,13} This study was designed to assess whether there is the difference of nocturnal enuresis prevalence children living in the mountain area and sea shore area, the correlation between social economic status and nocturnal enuresis and parent concerning to enuretic children.

Methods

This cross sectional study was conducted from September to October 1995, in Brastagi and Pantai Cermin area, North Sumatra Province. Brastagi was the highland area with the minimum whether temperature 15°C and maximum 24°C, height 1900 m from sea level. Pantai Cermin was the sea shore area with minimum whether temperature 22°C and maximum 33.6°C with the height of 0-5 m from sea level.

Subjects were selected by simple random sampling method from all kindergarten and elementary schools aged 5 to 15 years within both area. The inclusion criteria were children with age of 5 to 15 year who had nocturnal enuresis. The exclusion criteria were urinary abnormality and suspected urinary tract infection, organic disturbance, hypertension, cardiovascular disease, diabetes mellitus and diabetes insipidus. Data were collected by filling the questionnaires that had been brought one day before the examination and it has been requested back in the day of examination, physical examination and urine examination. Definitions and limitations used in this study were as follows.

Enuresis was defined as involuntary or unnecessary urination occurring repeatedly at the age of 5 years, without organic disturbance or urinary abnormality, with the minimal frequency 2 times monthly. Nocturnal enuresis was defined as enuresis occurring in the night. The socioeconomic status was judged using questionnaires based on data of World Bank. Family income was considered good if it was >Rp.70.000,-/capita/month or \$ 370.00/capita/year. Urine examination was done using Dipstick Multistix of Ames. Suspected urinary tract infection (UTI) was defined in the presence of nitrite and leukocyte esterase in the patient's morning fresh urine and in the presence of clinical symptoms of UTI. Data were tabulated and were analyzed by Fisher exact test. Value of $p < 0.05$ was considered to be significant.

Results

Of the 585 children from Brastagi and 554 children from Pantai Cermin, 7 children in each group were excluded because of suspected urinary tract infection, so that in each group remained 578 and 547 children. Table 1 shows the educational and occupational status of the parents who lived in Brastagi and Pantai Cermin. It was found that children who had nocturnal enuresis were 114 (19.3%) in Brastagi and 101 (18.5%) in Pantai Cermin. Using Fisher exact test, there was no association between geography with the prevalence nocturnal enuresis ($p > 0.05$) (see Table 2).

With respect to age group, the highest prevalence of enuresis was found in 5-6 years age group, namely 30.3% in Brastagi, and 30.0% in Pantai Cermin. No enuretic children were found in 15-16 years age group in both of area (Table 3). From 114 nocturnal enuretic children in Brastagi, 63 (55.3%) male and 51 (44.7%) female, while 101 children of Pantai Cermin 53 (52.5%) of them male and 48 (47.5%) female. Male was more frequent than female by 54.0% to 46.0%, but it was not statistically significant different.

Table 5 depicts the association between socioeconomic status of nocturnal enuretic children family with geographical area. It was found that there was no association between the low socioeconomic status in Brastagi (57.0%) and in Pantai Cermin (50.5%). Table 6 shows the percentage of parents who were concerned about their children's enuresis; 55.4% parents in Brastagi were concerned with enuresis on their children, while in Pantai Cermin it was 24.0%.

Discussion

To the best of our knowledge, there has been no report or data about the prevalence of nocturnal enuresis in children in the mountain and sea shore area in Indonesia. In this study, we found the prevalence of nocturnal enuresis of 19.7% in Brastagi and

Table 1. Occupation and educational level of the parents

	Brastagi				Pantai Cermin			
	Father		Mother		Father		Mother	
	n	%	n	%	n	%	n	%
Education								
▪ Elementary School	176	30.5	244	42.2	413	75.5	458	83.7
▪ Junior High School	173	29.9	151	26.1	77	14.8	49	9.0
▪ Senior High School	229	39.6	183	31.7	57	10.4	40	7.3
Occupation								
▪ Farmer	183	31.7	201	34.8	383	70.02	395	72.2
▪ Private employee	154	26.6	44	7.6	88	16.09	49	9.0
▪ Sales	82	14.2	126	21.8	39	7.13	25	4.6
▪ Civil employee	71	12.3	45	7.8	13	2.38	18	3.3
▪ Others	88	15.3	162	28.0	24	4.38	60	11

Table 2. Geography related nocturnal enuresis

Geographical area	Enuresis		Non Enuresis		Total	%
	n	%	n	%		
Brastagi	114	19.7	464	80.3	578	100.0
Pantai Cermin	101	18.5	446	81.5	547	100.0

$p > 0.05$

18.5% in Pantai Cermin. There was no correlation between geography and nocturnal enuresis (Table 2). The highest prevalence was found in 5-6 years age group, i.e., 30.3% in Brastagi and 30.0% in Pantai Cermin (Table 3). This figure was higher than that of Rushton et al who reported that the prevalence of enuresis in the age group of 5 years was 15-20%, 10 years (5%) and 15 years (1-2%),¹⁰ while Meadow reported that the prevalence of enuresis in the age group of 5 years were 10-15%.⁷ Arni et al¹⁴ reported that from 168 children (4-15 years) attending the outpatient clinic of Dr. Pirngadi Hospital Medan, 70 children (41.6%) had nocturnal enuresis. She found that

Table 3. Geography and child age related nocturnal enuresis

Age group (year)	Brastagi			Pantai Cermin		
	n	enuresis	%	n	enuresis	%
5 - 6	152	46	30.3	103	31	30.0
7 - 8	160	38	23.8	102	19	18.6
9 - 10	99	13	13.1	171	31	18.1
11 - 12	139	16	11.5	72	10	13.9
13 - 14	28	1	3.6	99	10	10.1
15 - 16	0	0	0	0	0	0
TOTAL	578	114	19.72	547	101	18.46

Table 4. Gender and geography related nocturnal enuresis

Gender	Brastagi		Pantai Cermin		Total	%
	n	%	n	%		
Male	63	55.3	53	52.5	116	54.0
Female	51	44.7	48	47.5	99	46.1
TOTAL	114	100.0	101	100.0	215	100.0

p>0.05

Table 5. Socioeconomic status related enuresis

Socio economic	Brastagi		Pantai Cermin		Total	%
	n	%	n	%		
Poor	65	57.0	51	50.5	116	54.0
Well	49	43	50	49.5	99	46.0
TOTAL	114	100.0	101	100.0	215	100.0

p>0.05

Table 6. Parental concern about enuresis

Parental concern	Brastagi		Pantai Cermin		Total	%
	n	%	n	%		
No concern	258	44.6	416	76.1	674	59.9
Concern	320	55.4	131	23.9	451	40.1
TOTAL	578	100.0	547	100.0	1,125	100.0

the prevalence of enuresis in the 4-5 years age group was 47.1%, while in 6-7 years it was 25.8%, and in 8-9 years it was 17.1%.¹⁴ In general, the prevalence of enuresis decreases with increasing age.¹ In some instances where enuresis continues until adulthood, neurosis will develop,^{7,10} and appropriate management will therefore be necessary.

Our series showed that in both geographical areas the prevalence of enuresis was slightly larger in boys than in girls; however the difference was not statistically significant. This is in contrast to Wagner¹⁵ who reported that from 148 children studied, only 49 children had enuresis, comprising 40 (81.6%) boys and 9 (18.4%) girls.¹⁵ Baldew also reported that the prevalence of enuresis was higher in boys than in girls with a of 2:1.¹ In this study showed that males and females ratio of 1.2:1. Higher prevalence of enuresis in boys is due to the late ability to control the bladder emptying.^{1,5}

Poor socioeconomic status has been believed as one of the risk factor for enuresis. In this study, the occupational status of the parent in Brastagi and Pantai Cermin was mostly the farmer. We found 65 from 114 nocturnal enuretic children (57.0%) with poor socioeconomic status in Brastagi, and 51 from 101 children (50.5%) in Pantai Cermin. There was no statistically significant association between socioeconomic status and nocturnal enuresis (Table 5). This is not consistent with data from Continuous Registration of Morbidity, Nijmees University, Huisartsen Institute (1971-1976), which indicates that the prevalence of enuresis is higher in the poor socioeconomic group.¹

Enuresis is commonly accompanied by urinary tract infection, especially in girls.^{1,4,6} In this study, children who were suspected to have urinary tract infection were excluded. We were unable to analyze the role of stressful environmental events, such as a move to a new house, marital conflict, birth of a sibling, or death in the family as well as hereditary factors on the development of enuresis because of lack of reliable data. Bakwin reported from that enuresis occurred in 77% of children with both of parents having enuretic history and 44% of children with one parent having such

history.¹ Different attitude on enuresis shows a seemingly different between parents who lived in mountain area (55.4%) and in coastal area (24.0%), this might be caused by better educational level of the parent in Brastagi than Pantai Cermin.

In summary, we have shown a high prevalence of nocturnal enuresis in children aged 5-15 years, both in mountain and in coastal area in North Sumatra. The prevalence of enuresis was almost similar in boys and girls. We did not find any association between geographical area and socioeconomic status of the family with the prevalence of nocturnal enuresis. Since psychological factor plays an important role in the development of nocturnal enuresis, further studies are needed involving other disciplines.

References

1. Baldew IM, Scholtmejer RJ. Enuresis. Jakarta: EGC, 1991;1-96.
2. Shaffer D. Enuresis. In: Rutter M, Hersov L, eds. Child and adolescent psychiatry modern approaches, 2nd ed. Oxford: Black Well Scientific Publications, 1985; 465-81.
3. Suripto B. Penanganan enuresis fungsional. *Majalah Psikiatri* 1990;23: 41-7.
4. Forman MA, Kerch Gaum WE, Hetzrecker WH. Psychosocial problem. In: Nelson textbook of pediatrics, 14th ed. Philadelphia: Saunders Co. 1992;54-8.
5. Melawat NAAF, Ardiningsih U. Enuresis. *Majalah Psikiatri* 1991; 24:39-53.
6. Gauthier B, Edelman CM, Barnett HL. Enuresis and other forms of abnormal urination. *Nephrology and Urology for Pediatricians*, Boston: Little Brown and Co, 1982;65-72.
7. Meadow R. Childhood Enuresis. *Med Inter* 1991;3585-8.
8. Rizal F. Penatalaksanaan enuresis. *Medika* NO.7/XX July 1994; 59-63.
9. Ramayati R. Nocturnal enuresis. *Pediatr Indones* 1983; 23:77-84.
10. Rushton HG. Nocturnal enuresis, Epidemiology, Evaluation and currently available treatment options. *J Pediatr* 1989;114:619-26.
11. Roy P. Enuresis. In: *Maj Kedok Keluarga*. 1993;2:532-53.
12. Bell GH, Devison JN, Scarborough H. Water and minerals. In: *Textbook of physiology and biochemistry*, 2nd ed, 1982;93-5.
13. Jureidini K. Enuresis. Notes for parents. *J Pediatr Obstet Gynaecol* 1984: 23-4.
14. Arni, Rusdidjas, Rafita R. Nocturnal enuresis. *Pediatr Indones* 1995;35:200-4.
15. Wagner, William et al. A controlled comparison of two treatments for nocturnal enuresis. *J Pediatr* 1982;2:302-7.
16. Wiramiharjo KM, Siburian M, Primono DA et al. Kondisi gizi anak sekolah dasar umur 10-13 tahun di kotamadya Bandung 1992. *MKB* 1993;25:160-6.