

ASYMPTOMATIC PROTEINURIA AND HEMATURIA IN SCHOOL CHILDREN

Ziya BAYRAKTAROĞLU*, Yavuz COŞKUN**, Ali ÇİL***, Mehmet BOZ***, Abdulkadir YILMAZ***

Key Words: Screening, childhood, proteinuria, hematuria.

ABSTRACT

A preliminary baseline survey was conducted estimate the prevalence of asymptomatic proteinuria and hematuria in a group of 1770 schoolchildren (778 girls and 992 boys). Urine specimens were collected in the morning and evaluated one hour using Ames Multistick-10 dipsticks. Blood reaction positive urine samples with dipsticks were also evaluated microscopically. Hematuria and proteinuria were defined as a condition with more than four red blood cells per high powered field in the sediment of centrifuged urine and greater than 30 mg/dl values in dipsticks, respectively. The prevalences of hematuria and proteinuria were found as 3.61 % (42 girls and 22 boys) and 5.59 % (51 girls and 48 boys) in all children. In six-eleven age population studied (551 girls and boys) the prevalences of hematuria was 2.71 % (20 girls and 10 boys) and proteinuria was 4.53 % (30 girls and 20 boys). In the other group aged twelve-eighteen (227 girls and boys) the prevalences of hematuria and proteinuria were 5.09 % (22 girls and 12 boys) and 7.34 % (21 girls and 28 boys). In the comparison of two groups prevalence of hematuria and proteinuria in the 12-18 age group were significantly higher than the other group.

INTRODUCTION

Hematuria or/and proteinuria in childhood may occur as an isolated finding. Although usually recognized as a benign sign, asymptomatic proteinuria is however to carry a small risk of some disease and many chronic renal conditions(1,2).

Hematuria of which various causes are well documented unassociated with significant symptoms may be an early finding of serious illnesses. For these reasons many comprehensive epidemiological studies have been made to investigate the prevalences of these conditions in childhood and adults as well(3-7).

The aim of this study is to determine the prevalence of asymptomatic proteinuria and hematuria in schoolchildren including adolescents in the region of Gaziantep.

* Assistant Professors of Pediatrics, Gaziantep University Faculty of Medicine

** Associate Professor of Pediatrics, Gaziantep University Faculty of Medicine

*** Resident in Pediatrics, Gaziantep University Faculty of Medicine

MATERIAL AND METHOD

An unselected population of 1770 healthy schoolchildren (778 girls and 992 boys) aged 6 to 18 was included (Fig.1). The students were divided into 6-11 age and 12-18 groups.

Urine specimens were collected in the morning and evaluated within one hour using Ames multistick-10 dipsticks and Clinitek 100 dipstick analyser. Blood reaction positive urine samples with dipsticks were also evaluated microscopically.

Hematuria and proteinuria were defined as a condition with more than four red blood cells per high powered field in the sediment of centrifuged urine and greater than 30 mg/dl values (1+) in dipsticks, respectively.

RESULTS

Proteinuria was detected in 5.59 % (51 girls, 48 boys) of the children investigated. In the group of six-eleven age (551 girls and 552 boys), the prevalence of proteinuria was 4.53 % (30 girls, 20 boys) while this ratio was 7.34 % (21 girls, 28 boys) in the twelve-eighteen age group (227 girls and 440 boys).(Fig.2,3).

Hematuria was found in 3.61 % (42 girls, 2 boys) of the children. In the groups of six-eleven age and twelve-eighteen age, the hematuria prevalences were 2.71 % (20 girls, 10 boys), and 5.09 % (22 girls, 12 boys) respectively (Fig.2,4).

In the comparison of two groups, prevalences of hematuria and proteinuria in twelve-eighteen age group were significantly higher than the other group ($p<0.01$). This difference has not been observed in the other group.

DISCUSSION

Epidemiologic studies related to determine asymptomatic hematuria or/and proteinuria are becoming more important of the aspect of the diagnosis and treatment of several renal and systemic diseases (8-11).

In the detection of proteinuria in these studies, dipsticks that is accepted as a reliable method, were generally used (11,12).

In this study prevalence of proteinuria in 1770 children was 5.59 %. In the studies of Wagner et al(11), Altıntaş et al(13), Düşünsel et al(14) the proteinuria prevalences which were similar to our results, were found as; 5.4 %, 4.4 % and 4.06 %, respectively. On the other hand some authors reported lower prevalence values, these difference is likely to originate from timing of the urine sampling, which affects the orthostatic and exercise proteinuria(15).

As in agreement with previous reports, our results showed that the proteinuria

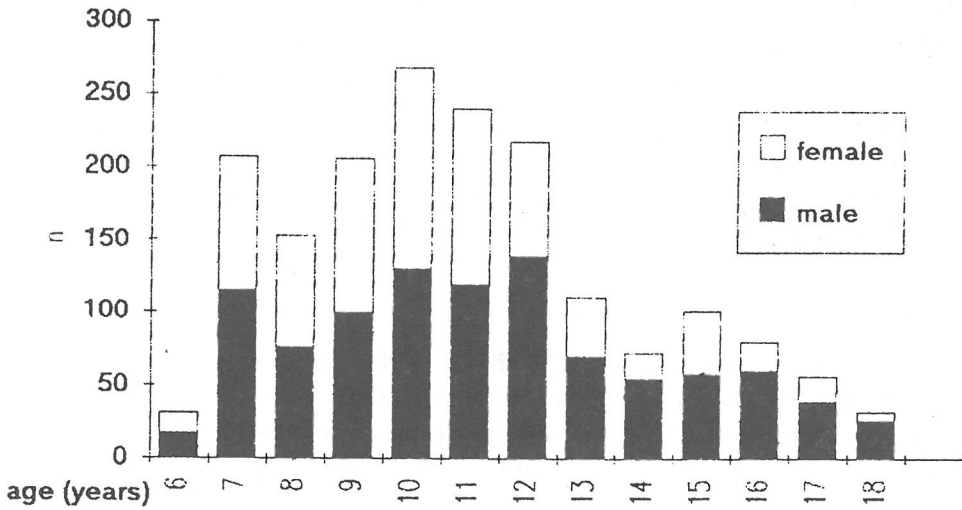


Fig 1. Distribution of the cases by sex and age

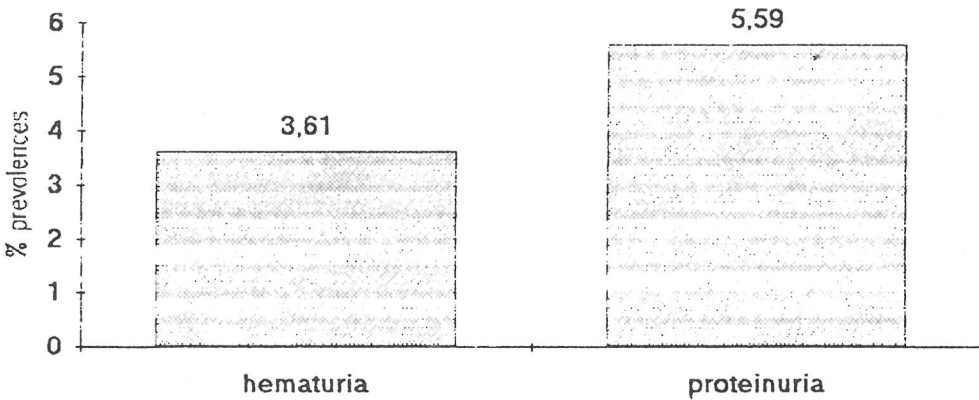


Fig 2. Prevalences of hematuria and proteinuria in 1770 schoolchildren

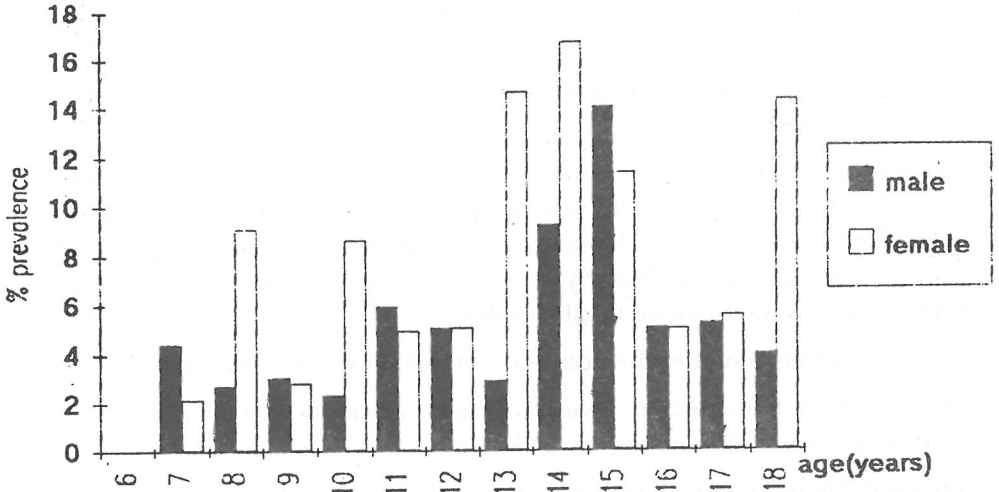


Fig 3. Prevalence of proteinuria by sex and age

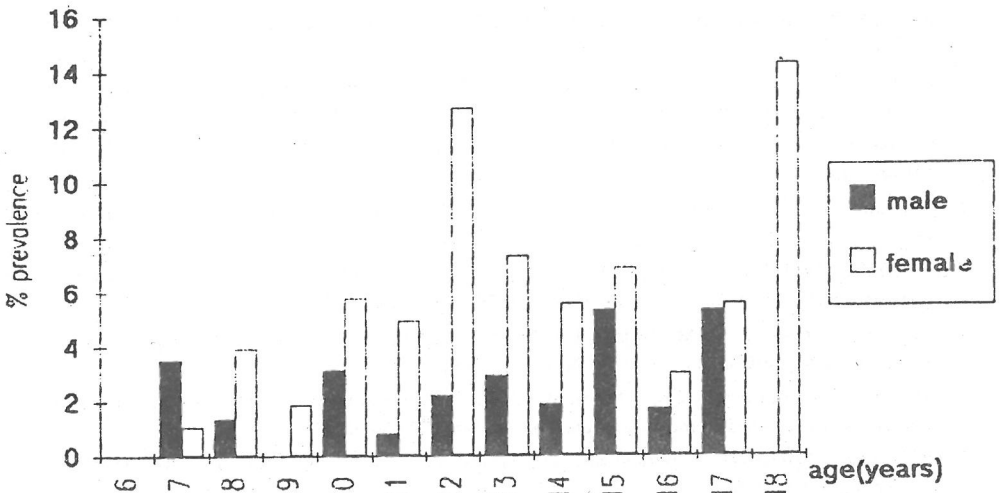


Fig 4. Prevalence of hematuria by sex and age

prevalence in adolescent group (12-18 age) was higher than the preadolescents (6-12 age)(4,6). Although the exact cause of this age dependent proteinuria is not known some explanation such as the cumulation of the proteinuria cases with age and variations in hormonal status have been postulated(4,11).

There is no important differences in terms of proteinuria between both sex as also confirmed in this study.

In our study it was noticeable that the presence of hematuria was more common (3.61 %) when compared with similar epidemiological studies (3,6). We also observed the prevalence of hematuria was significantly higher in the twelve-eighteen age group particularly in females, resulted an increase in total hematuria prevalence value in all children.

It is not obvious whether the occurrence of hematuria depends on age.

The increased hematuria in twelve-eighteen group is due to higher rate of occurrence mainly of hematuria in girls.

Although we tried to pay great attention, menstrual contamination should have played an important role in higher percentages in girls. In addition to this explanation again cumulation of cases with age as in proteinuria may affect the hematuria prevalences.

It can be suggested that further studies conducted to estimate the prevalence of asymptomatic proteinuria and hematuria in children are needed.

REFERENCES

- 1- Norman ME., An office approach to hematuria and proteinuria. *Pediatr Clin North Am* 34:3, 1987.
- 2- James JA.: Proteinuria and hematuria in children: Diagnosis and assesment. *Pediatr Clin North Am* 29:1, 1976.
- 3- Vehaskari VM., Rapola J., Koskimies O., et al.: Microscopic hematuria in schollchildren: Epidemiology and clinicopathologic evaluation. *J Pediatr* 95:676, 1979.
- 4- Vehaskari VM., Rapola J.: Isolated proteinuria: Analysis of a schoolage population. *J Pediatr* 101:661, 1982.
- 5- Boineau FG., Lewy JE.: Evaluation of hematuria in children and adolescents. *Pediatr Rev* 11:4, 1989.
- 6- Dodge WF., West EF., Smith EH., et al.: Proteinuria and hematuria in schoolchildren, epidemiolgy and early natural history. *J Pediatr* 88:327, 1976.
- 7- Tracy AL., Grasmeder HM., Kaplan BS.: An approach to the evaluation and treatment of microscopic hematuria. *Pediatr Clin North Am* 38:3, 1991.
- 8- Schröder CM., Bontemps CM., Assmann KJM., et al.: Renal biopsy and family studies in 65 children with isolated hematuria. *Acta Pediatr Scan* 79:630, 1990.
- 9- Miller PFW., Speirs NL., Aparicio SR., et al.: Long term prognosis of recurrent hematuria. *Arch Dis Child* 60:420, 1985.
- 10- Rao BA., Kagan AR., Steckel RJ.: Asymptomatic hematuria and abnormal urine cytology. *Br J Urol*.62:846, 1989.

- 11- Wagner MG., Smith FG., Tinglof BO., et al.:Epidemiology of proteinuria. J Pediatr 73:825, 1968.
- 12- Harrison NA., Rainford DJ., White GA., et al.:Proteinuria - What value is the dipstick? Br J Urol 63:202, 1989.
- 13- Altıntaş G., Anarat A., Alhan E., et al.:XXVII Türk Pediatri Kongresi:Serbest Bildiri Özetleri:106, 1988.
- 14- Düşünsel R., Hasanoğlu E.:Kayseri il merkezi ilkokul çocuklarında proteinüri hematüri prevalansı. Çocuk Sağlığı ve Hastalıkları Dergisi 31:117, 1988.
- 15- Vehaskari VM.:Orthostatic proteinuria. Arch Dis Child 57:729, 1982.