

## STONES

### A STUDY ON THE PREVALENCE OF UROLITHIASIS AMONG TURKISH MEDICAL DOCTORS\*

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Worldwide studies on the epidemiology of urolithiasis have revealed that occupation plays an important role in the genesis of renal stone disease<sup>1,2</sup>.

Among the various professions, the medical profession was found to be one of the major risk groups<sup>3-5</sup>.

Although the exact figures are not known, previous studies have shown that the incidence of urolithiasis in Turkey is rather high<sup>6-7</sup>.

In this study, we have investigated this high risk group in a specific area in our country in order to obtain clues that would shed light on the etiology of urolithiasis. The subject of this study is the medical doctors of Hacettepe University Medical School, and the period covered is December 1983 to June 1984.

#### Material and Methods

From a total of 623 medical doctors at Hacettepe University, this study covers the 434 from whom sufficient data were obtained.

In the first stage, a questionnaire was given out which asked for personal information, professional record, personal and family history related to urolithiasis and related disorders and the daily consumption of water tea and coffee.

Those who gave a history of urolithiasis either personally or in the family and those presenting with a disorder which might be related to urolithiasis were included in the second stage of the study. With this group of 135 medical doctors further investigations such as urinalysis, KUB or IVP were carried out whenever this was agreed to. A detailed statistical analysis was then made with the assistance of the Hacettepe University Computer Center.

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## Results

Of the 122 females and 312 males covered in this study, the ages ranged from 24-66, the average age being  $35.21 \pm 10.22$ . Table I shows the basic data obtained from the medical doctors. As can be seen, the prevalence of urolithiasis in this study was found to be 12.90% (56/434). Positive stone history was found in 48 of the medical doctors (11.06%); 9 of these cases (2.07%) were operated on, while 39 (8.99%) passed stones or gravel. Thirty-eight percent of the medical doctors with a history of urolithiasis stated that they had passed more than one stone. A positive family history was found in 110 cases (25.34%). In 30 of these cases, there was more than one member in the family who suffered from urolithiasis.

TABLE I  
Classification of Positive Findings of 434 Medical Doctors

|                                          | Number of<br>cases | %     |
|------------------------------------------|--------------------|-------|
| Prevalence of Urolithiasis               | 56                 | 12.90 |
| Stone positive (8 cases 1.84%)           |                    |       |
| Operated (9 cases 2.07%)                 |                    |       |
| Passed stones or gravel (39 cases 8.99%) |                    |       |
| Positive family history                  | 110                | 25.34 |

The stone positive group was defined arbitrarily in this study as cases with a positive urolithiasis history and/or those who had stones during the study. This group consisted of 56 cases that is 12.90% of all the medical doctors. This percentage represents the prevalence of urolithiasis. The stone negative group was made up of medical doctors who had no problem related to urolithiasis at all. Three hundred and seventy eight of the doctors, that is 87.10% of them, were in this group.

Table II shows the amount of daily water, tea and coffee intake of these two groups. As seen here, the differences between the two groups regarding coffee and tea

TABLE II  
Fluid Intake of the Two Groups

| Groups         | Number<br>of<br>cases | Water $\pm$ SD (cc)  | Tea $\pm$ SD (cc)   | Coffee $\pm$ SD (cc) |
|----------------|-----------------------|----------------------|---------------------|----------------------|
| Stone positive | 56                    | $1223.21 \pm 978.54$ | $601.34 \pm 474.83$ | $57.59 \pm 49.06$    |
| Stone negative | 378                   | $976.80 \pm 620.72$  | $618.19 \pm 372.14$ | $65.90 \pm 85.90$    |

intake were not statistically significant. But the water intake of the stone positive group, was significantly higher than that of the stone negative group ( $1223.21 \pm 978.54$  versus  $976.80 \pm 620.72$ ,  $p < 0.05$ ). Among the 56 cases in the stone positive group, 14 had gastrointestinal system disorders. But when this figure is compared with that of the stone negative group, there is no statistically significant difference. Of these doctors 42.6% (185) were surgeons, while the remaining 57.4% (249) were non-surgeons. Of the surgeons, 31 cases (16.8%) were classified as stone positive, while in the other group 25 cases (10.1%) were stone positive. Again, this difference was not statistically significant (Table III).

TABLE III  
Prevalence of Urolithiasis According to Speciality

|             | Stone (+)         | Stone (—)   |
|-------------|-------------------|-------------|
| Surgeon     | 31 (16.8%)        | 154 (83.2%) |
| Non-Surgeon | 25 (10.1%)        | 224 (89.9%) |
|             | $\chi^2 p > 0.05$ |             |

Of the 56 stone positive cases 43 were male, 13 were female. This distribution was not found to be different from that of the total population in this study ( $p > 0.05$ ).

The family history of these 56 cases was investigated. A significant correlation between stone positive cases and their fathers compared to the other members in the family has been observed in regard to stone history. When the onset of symptoms related to urolithiasis was investigated in the stone positive group, it was interesting to note that 62.5% of the cases (35 cases) experienced their first attack after graduation from medical school. Another 26.78% reported that the onset was during medical school years. It should be stated that among the eight medical doctors who had urolithiasis actually during the course of the study, surgeons were easily in the majority (6 versus 2 cases).

### Discussion

The incidence of urolithiasis varies between 43.1 and 196.5 per 100,000<sup>9</sup>. In our study the prevalence of urolithiasis among medical doctors was found to be 12.90%. In other studies Scott<sup>3</sup> and Larsen<sup>5</sup> obtained 6.7 and 8% respectively. In these studies the figures were derived from the number of renal colic episodes that the doctors had experienced in the past.

Since our study lacks the control group of the same age and the same socio-economic status, it is hard to predict from this study that occupation plays an important role in the genesis of urolithiasis.

As a result of the pitfalls in estimating the actual incidence of urolithiasis, prevalence rates obtained from population studies give a clearer picture of the size of the problem. Ljunghall and Hedstrend found a prevalence of 13.7% while other authors have shown rates of 6.8, 12 and 3.8 percent in various studies<sup>5,10,11</sup>. The stone positive group in our study which consisted of 56 cases (12.90%) represents the prevalence of urolithiasis in a specific profession. This 12.90% (56 cases) consisted of 8 doctors who had urolithiasis at the time of this study, 9 doctors who had been operated on due to urinary stones and 39 who had passed stones at least once before the time of the study. These figures clearly show that urolithiasis is seen rather frequently in our profession. Further 25.34% of the doctors in this study group had a positive family stone history. This again emphasizes the high incidence of urolithiasis in Turkey at every social level.

One of the basic assumptions in the literature of urolithiasis is that increased water intake and thus increased urinary output decreases the incidence of urinary calculi, and this is also confirmed in the literature<sup>12</sup>. This is why, in the questionnaire, we asked about the amount of water, tea and coffee consumed. When the results were evaluated in regard to stone positive and stone negative groups, the differences in the daily amount of tea and coffee intake were not statistically significant. But the amount of water consumed by the stone positive and stone negative groups was 1223.21 cc and 976.80 cc respectively. This difference was found to be statistically significant ( $p < 0.05$ ). Although these results stand contrary to our general knowledge, the difference can be accounted for by the fact that urologists urge the need to increase fluid intake on the stone positive group<sup>13</sup>. Similarly the lower tea and coffee consumption in the stone positive group may also be attributed to the suggestion of urologists.

According to recent clinical surveys, there is substantial epidemiological evidence of there being a close association between bowel disorders and urinary lithiasis<sup>14,15</sup>. In our study, however, a correlation was not to be observed. We must admit though, that our study is more of a descriptive epidemiological study than an analytical one.

In one epidemiological study on urolithiasis<sup>3</sup> the incidence was found to be highest among surgeons and this was attributed to stress factors and to the warm and humid work environment; similarly, in our study, 16.8% of the surgeons were stone positive and only 10.1% of the non-surgeons. These figures, however, are of no statistical significance.

The relationship between heredity and urolithiasis has been known and studied for the last 50 years<sup>16</sup>. In our study, among the stone positive cases, the correlation between the doctors and their fathers in regard to their previous stone history revealed significant results ( $p < 0.05$ ). With a descriptive epidemiological study of this kind it is very difficult to say conclusively that occupation *per se* plays a role in the genesis of urolithiasis.

It is therefore difficult to say whether occupation is a primary factor in stone disease or whether it merely confirms other aspects of environment. We can, however, safely conclude by saying that the incidence of urolithiasis is rather high in Turkey and there are a fair share of doctors in the numbers.

### Summary

This study covers 434 medical doctors for whom sufficient data were obtained, from among a total of 623. A questionnaire was given out to all in the first stage and the doctors who had positive findings at this stage were called for further investigations, such as urinalysis, KUB and IVP. There was urolithiasis in 12.90% (56/434). A positive family history was found in 110 cases (25.34%). The differences between stone positive and stone negative groups regarding coffee and tea intake were not statistically significant. The water intake of the stone positive group was significantly higher than that of the stone negative group. When the prevalence of urolithiasis was investigated with regard to the surgeon and non-surgeon groups, the difference was not found to be statistically significant (16.8% as against 10.1%).

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