

# Development of transurethral resections of the prostate in relation to nocturia in northern Sweden 1992-1997

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**Objective:** To assess the temporal trend in surgical treatment of benign hypertrophy of the prostate in Sweden, particularly the possible influence of nocturia on the probability to be treated by a transurethral resection operation of the prostate (TURP).

**Materials and methods:** There were 2501 elderly men recruited by a questionnaire from a group of pensioners ( $n=4035$ ; response rate 62%). Their age was 73.3 (6.4) years. The questionnaire included questions on their health and diseases, drugs, sleep habits and the number of nocturnal voiding episodes. Data on deaths from July 1, 1992 to December 31, 1997 were obtained.

**Results:** During the study period 176 TURPs had been performed on 170 men (annual incidence of first TURP:

12.4 treatments/1000 men). The annual rate of TURP was 8.4 treatments/1000 men at ages under 69 years, in men at ages 70-74 years 15.7 and in men 75 years and older 12.7 treatments/1000 men, respectively ( $p < 0.05$ ). When divided in two time periods of equal length (33 months), 107 (14.1 treatments/1000 men/year) TURPs were performed during the first time period (P1), and 63 (8.6 treatments/1000 men/year) were performed during the second period (P2), (OR P2 vs. P1: 0.59; CI 0.43-0.81). During P1, but not during P2, there was an increase in TURP frequency number in relation to the number of nocturnal micturitions ( $p < 0.0001$ ).

**Conclusions:** TURPs decreased by 41% from P1 to P2. During P1 the occurrence of nocturia showed a significant influence of the probability to be subjected to TURP. No such tendency was recorded during P2.

**Key Words:** benign hypertrophy of the prostate, diuresis, elderly, men, nocturia, nocturnal polyuria, prostate, transurethral resection.

## Introduction

Prostatism has been a common term which includes a series of symptoms that are believed to be caused by prostatic enlargement resulting in voiding dysfunction.<sup>1</sup> Voiding dysfunction, including outlet obstruction and lower urinary tract symptoms (LUTS) has been increasingly common in elderly men and almost all men by the age of 80 are affected.<sup>2</sup> By age 75, between 10% and 25% of men require intervention for problems caused by benign hypertrophy of the prostate (BPH).<sup>3</sup>

The main cause of nocturia in elderly men has long been believed to be an enlargement of the prostate

with outflow obstruction, causing irritative bladder symptoms.<sup>4</sup> However, nocturia has shown poor responsiveness to surgical treatment in BPH.<sup>5</sup> Further, when BPH scores assessed with the International Prostate Symptom Score questionnaire (I-PSS) have been assessed in both men and women, the scores of the women have been found to be at almost the same level as those of the men.<sup>6</sup> These findings have led to the view that other mechanisms other than BPH maybe involved in the development of nocturia in elderly men.<sup>6</sup>

The management of BPH has changed during the last decade.<sup>7,8</sup> In many cases surgical procedures have been replaced by medical treatment. In a recent review, Narayan et al describe medical therapy as the first-line approach.<sup>8</sup>

The aim of this study was to assess the possible influence of nocturia on the decision to treat by transurethral resection of the prostate (TURP).

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## Material and methods

In June 1992 all 4035 men of the National Swedish Pensioners' Association (SPF) in the Swedish counties of Västerbotten and Norrbotten were asked to participate in a questionnaire survey and were sent a questionnaire. A further questionnaire was sent to those who did not respond within 1 month.

The questionnaire has been described previously.<sup>9</sup> The questions concerned the general state of health, the occurrence of somatic diseases and symptoms, everyday habits and behavior, and the use of drugs. In addition, there was a question on the number of nocturnal voiding episodes.

In March 1999 data on TURPs in the study population from July 1, 1992 to December 31, 1997 were extracted from the National Register of Hospital Care at The Centre for Epidemiology at The National Board of Health and Welfare, Stockholm.

### Statistical methods

Standard methods were used for calculating mean values and standard deviations (SD) unless otherwise stated. Group comparisons of non-numerical data were made with the chi-square test. For comparing frequencies, odds ratios (OR) with a 95% confidence interval (CI 95%) were calculated. An ANOVA was used for comparing more than two series of numerical data.

## Results

Of the target group for the questionnaire of 4035 men, evaluable responses were received from 2501 men (response rate = 62%). Their mean age was 73.3 (SD 6.4) years. Poor health was reported by 17% of the whole group of men, by 12% of the men with no micturition at night, and by 13%, 19% and 30% of the men with one, two and three or more nocturnal micturitions, respectively ( $p < 0.0001$ ).

During the period July 1, 1992 to December 31, 1997, 176 TURPs were performed on 170 men (corresponding to an annual incidence of first TURP of 12.4/1000 men).

There was a decrease in TURP during the study period Table 1. When the study period was divided into two periods of equal length (33 months), it was found that during the first period (P1), 107 TURPs (14.1/1000 men) per year and during P2 63 TURPs (8.6/1000 men) (OR P2 vs. P1: 0.59; CI 0.43-0.81).

The mean age at the first treatment in the whole group was 75.4 (5.0) years and this did not change during the study period. Six men (3.5%), aged 72.3 (3.6) years, were treated twice. None of the men was treated three times. During the whole study period

TABLE 1. The number of TURPs (first session) each year from 1992 to 1997.

| Year  | Number |
|-------|--------|
| 1992  | 19*    |
| 1993  | 26     |
| 1994  | 41     |
| 1995  | 34     |
| 1996  | 22     |
| 1997  | 28     |
| Total | 170    |

\*July 1 – December 31

the annual rate of TURP was 8.4/1000 men at ages < 70 years, 15.7/1000 at ages 70-74 years and 12.7/1000 in men aged 75 years and older ( $p < 0.05$ ). The corresponding frequencies during P1 were 10.6, 21.4 and 14.8, respectively, and during P2 6.6, 11.3 and 11.4, respectively.

Ten percent of the men reported no micturition at night, and 56%, 26% and 9% reported one, two and three or more micturitions at night, respectively. During P1, but not during P2, there was a positive relationship between the number of TURPs and the number of nocturnal micturitions ( $p < 0.0001$ ) Figure 1.

The length of hospital stay for TURP was 5.2 (3.1) days and decreased during the whole study period Figure 2. There was no difference in the duration of

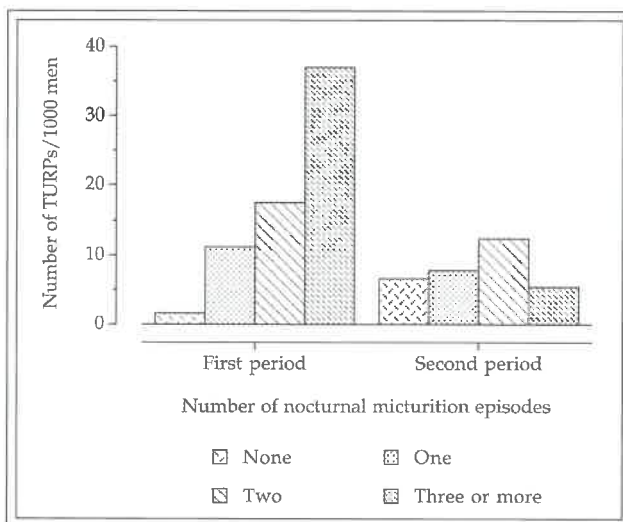
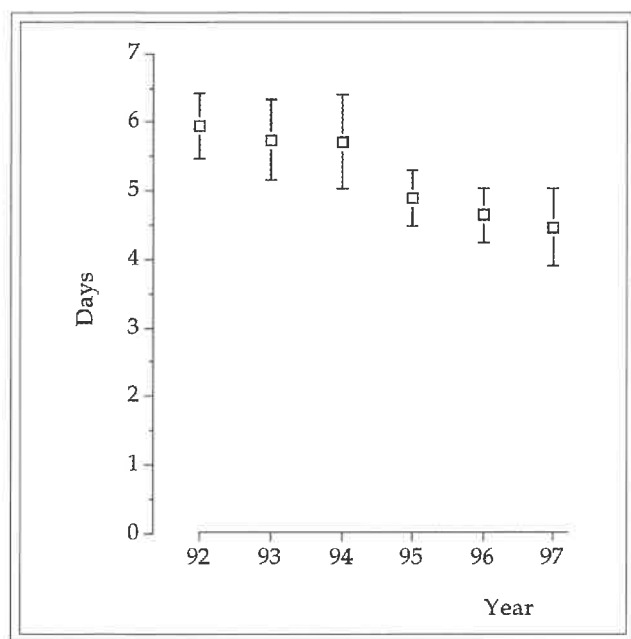


Figure 1. The number of transurethral resection operations (TURP) per 1000 men during the first and the second half of the study period in relation to the number of nocturnal micturition episodes June 1992.



**Figure 2.** The number of days of hospital stay (mean  $\pm$  SEM) each year in connection with TURP for the whole group.

hospital stay between the first and the second TURP. The hospital stay in men aged < 70 years was 4.9 (2.2) days, in ages 70-74 years 5.1 (2.5) days and in men over 75 years of age 5.4 (3.5) days (NS).

## Discussion

In the interpretation of the results of this study, the question of validity is of great importance. The survey was carried out among elderly men belonging to the National Swedish Pensioners' Association (SPF). Membership of this association is voluntary. The rate of participation in this study was 62% out of a relatively large basic population.

Another question concerns the durability of nocturia. Lee et al found that untreated nocturia and other urological symptoms in elderly men showed a general tendency to increase over time during a follow-up period of 5 years.<sup>10</sup> Thus it was assumed that nocturia reported by the present study subjects at the start of the study would be persistent in most cases during the study period.

The frequency of TURP decreased throughout the study period. Such a decrease in the rate of TURP during the first half of the 1990s has been reported from other countries. In the period 1989 - 1995, the annual rate of TURPs per 1000 men decreased in the USA from 15 to 5.5, in France from 14 to 8.9, in Denmark from 10 to 5.5 and in Germany from 9 to 6.8.<sup>11</sup>

The proportion of subjects needing a second TURP in the whole study period is comparable with figures reported by Lu-Yao et al, 3.0% after 3 years and 5.5% after 7 years.<sup>12</sup>

One surprising finding was that the positive relationship between TURP and the initially reported number of nocturnal micturition episodes during the first period of the study (P1) was absent during the second period (P2) Figure 1. The frequency was lower during P1 among men with no nocturnal micturition, and about the same during P1 and P2 for men with one or two nocturnal voids, while the lowest incidence of TURP during P2 was found among men with three or more nocturnal voiding episodes.

This change indicates a difference over time in the evaluation of the need for treatment in relation to symptoms and clinical findings in men with BPH. It may reflect an increasing awareness that obstruction, prostatism, and hyperplasia of the prostate are not synonymous and that there are cases of nocturia in men that are not caused by BPH.<sup>7</sup>

Although there are men with obstructive symptoms who are troubled by nocturia, there is a poor correlation between prostate size and micturition disturbances.<sup>4,13</sup> Surgical treatment seldom gives satisfactory relief of the nocturia in men with BPH.<sup>5</sup> Nocturia is a common symptom among elderly men irrespective of BPH symptoms.<sup>14,15</sup>

Nocturnal polyuria, due to a disturbance in the vasopressin system, is one common cause of nocturia in the elderly, first described in 1991.<sup>16,17</sup> This condition, denominated as the Nocturnal Polyuria Syndrome (NPS), is caused by a deterioration of the diurnal variation in the vasopressin system, with absence of an increase in nocturnal vasopressin.<sup>18</sup> Low nocturnal levels of vasopressin result in large amounts of urine at night, in the extreme case 85% of the 24-hour excretion, and consequently an overloading of the bladder capacity.<sup>15</sup> The prevalence of NPS in a 75-year-old population has been calculated to be 2-3%.<sup>15</sup>

The awareness of this condition may to some extent explain the reduced number of TURPs in men with numerous nocturnal voids during P2 as compared with P1. Nocturia in general and NPS in particular are associated with deterioration of sleep, and treatment with desmopressin, a vasopressin analogue, improves the sleep continuity.<sup>19-21</sup>

Another change in the view of urological symptoms in elderly men concerns lower urinary tract symptoms, which may occur without any causative link to prostatic enlargement.<sup>1</sup> Such symptoms can also be alleviated by medical treatment.<sup>11</sup> Two kinds of medication, alpha-adrenoreceptor blockers and 5-alpha-reductase

inhibitors are available and have been extensively used during the last decade.<sup>8</sup> Alpha-blockers relieve the urinary tract obstruction by smooth muscle relaxation and 5-alpha-reductase inhibitors by reducing the prostate size.<sup>8,11</sup> Both alpha-blockers and 5-alpha-reductase inhibitors cause a reduction of LUTS.<sup>22,23</sup>

There was no age-related increase in the frequency of TURP at ages over 75 years either during P1 or P2 in contrast to the report by Lu-Yao et al.<sup>12</sup>

There is no data available on medication with alpha-blockers and 5-alpha-reductase inhibitors during the study period in the present study group. On a nationwide level, however, there was an increase in the frequency of drug prescriptions for urological symptoms in men during the study period. The prescription rate for drugs against BPH increased from 0.7 to 2.7 DDD/1000 inhabitants between 1993 (the first year for which data can be obtained) and 1997.<sup>24-26</sup>

In 1997 the prescription rate for drugs for BPH symptom relief for men of ages 60-64 years in Sweden was 9.7 daily doses/1000 men and for men of ages over 80 years 37.5 doses/1000 men. It seems reasonable to assume that elderly men (especially at ages over 80 years) are advised medical treatment prior to TURP to a larger extent than younger men. This is a favorable development, as TURP is associated with some risk of complications and postoperative morbidity as well as a small but not unimportant mortality risk.<sup>2</sup> The importance of avoiding TURP in favor of medical treatment in generally aged and frail men has previously been emphasised.<sup>4</sup>

The length of hospital stay in connection with TURP decreased by 25% from 1992 to 1997. Similar changes have been reported from other clinics from the second part of the 1990s.<sup>27,28</sup> The hospital stay, 5-6 days is also comparable to that in other reports from the same time period.<sup>28</sup>

During the first half of the study period the occurrence of nocturia showed a significant influence on the probability of undergoing TURP, and an increasing severity of nocturia indicated an increasing probability of TURP. During the second half of the study period no such relations were observed. The results may support the view that the symptoms calling for TURP in this group of elderly men were defined more specifically related to urine outlet obstruction rather than to irritative bladder symptoms and nocturia during the course of 1992 to 1997.

In summary, 2501 elderly men were assessed with a questionnaire and the occurrence of TURP was followed for a study period of five and a half years. There was a decrease in TURPs by 41% from the first to the second half of the study period. □

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