

## Prevalence of Lower Urinary Tract Symptoms In Elderly Men Above 50 Years of Age

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**Objectives:** To assess the prevalence of lower urinary tract symptoms in the hospital attendants population.

**Subjects and Methods:** One thousand males, above 50 years of age, attending their patients at Services Hospital Lahore, were interviewed with a questionnaire. The questionnaire comprises International prostate symptom score (IPSS) questionnaire. The persons who were known cases of Diabetes mellitus, Congestive cardiac failure, Neurogenic bladder, vesical stone or stone in lower ureter, urinary tract infection, urinary bladder growth or patients who were taking drugs which effect urinary system were excluded from the study.

**Results:** Lower urinary tract symptoms were common and increased with increase in age. The prevalence of at least one urinary symptom was 53.7 % in men over 50 years of age ( 51.7 % among 51-60 years old men, 62.04 % among 61-70 years old men and 71.43 % in 70 years and above old men). Most of the symptoms were mild with nocturia most prevalent and urge incontinence (an additional symptom not included in IPSS score chart) the least.

**Conclusion:** The high incidence of lower urinary tract symptoms may indicate high prevalence of benign prostatic enlargement, but other causes are also involved. With the increase in the mean age of the general population, the number of individuals with lower urinary tract symptoms is likely to increase. As lower urinary tract symptoms adversely affect quality of life, improved treatment options and increased public awareness of benign prostatic hypertrophy and lower urinary tract symptoms are needed to combat a problem facing the growing number of elderly men in the population.

**Keywords:** BPH, Lower urinary tract symptoms, Prevalence.

### INTRODUCTION

Lower urinary tract symptoms (such as frequency, urgency, incomplete bladder emptying, intermittency, nocturia, straining and weak stream) are a common affliction of middle aged and older men. In these people the main cause of lower urinary tract symptoms is benign prostatic obstruction secondary to benign prostatic hyperplasia. Although there is no direct relationship between size of prostate and symptoms (individuals may have symptoms and no prostatic enlargement, prostatic enlargement and no symptoms or symptoms and prostatic enlargement both).

Until the 1990s, studies on urinary disorders were largely based on selected populations such as men admitted to hospital [1] but most of the more recent studies were based on representation samples of the total population. Most of the time the basic aim was to estimate the prevalence of benign prostatic enlargement secondary to benign prostatic hyperplasia. Benign prostatic hyperplasia is a histopathological definition for a condition that

affects both the glandular and smooth muscle of the prostate in varying proportions, it is often characterized by a benign enlargement of the prostate [2]. However no single definition for benign prostatic hyperplasia has gained wide acceptance for use in epidemiological studies, as there is controversy about the specific clinical diagnostic criteria [3]. While benign prostatic hyperplasia is recognized as a common condition in men over 40 years [4-8]. With both autopsy and clinical retrospective studies agreeing that the prevalence increased with advancing age [5,6,8], the actual prevalence of benign prostatic hyperplasia in the community is difficult to determine as it depends both on the diagnostic criteria used and the population sampled [7,9].

Although the symptomatology of benign prostatic hyperplasia varies considerably amongst men, most diagnosed cases will have some degree of bladder outlet obstruction and lower urinary tract symptoms. However, lower urinary tract symptoms are not necessarily indication of benign prostatic hyperplasia and vice versa, as

men may have lower urinary tract symptoms caused by conditions unrelated to the prostate. Despite high rates of prevalence of benign prostatic hyperplasia, several studies have reported that urologists see only a fraction of men with clinical symptoms often associated with benign prostatic hyperplasia (for example; urgency, frequency and nocturia) and that many more men may be in need of further assessment and treatment [6,10]. Drummond et al [11] further suggested that the main burden of benign prostatic hyperplasia is manifested as a reduction in quality of life and not reflected in the consumption of health care resources. This situation could deteriorate in the future as the number of elderly men continues to increase in the next decade.

## METHOD

All these subjects were interviewed and a questionnaire was compiled by asking about their lower urinary tract symptoms. The questionnaire was prepared by some modification in the American Urological Association Symptom Score criteria. Regarding age, the people were divided into three groups. First group comprised age between 51 and 60 years, second between 61 and 70 years and third 71 years and above. All the data collected was then compiled and prevalence rate was calculated. This prevalence rate was then correlated with the age

## STATISTICAL ANALYSIS

Prevalence rate of lower urinary tract symptoms was calculated. Pearson's correlation coefficients (  $r$  ) were used to evaluate the relationship between the lower urinary tract symptoms and age. The significance of correlation was calculated by applying student "t" test.

## RESULTS

Among these 1000 males, 537 (53.7 %) were found to have lower urinary tract symptoms ranging from mild to severe symptoms. Age of the persons interviewed ranged from 51 - 77 years with a mean age of  $55.77 \pm 4.85$  years. These persons were placed in three different age groups. First from 51 to 60 years of age, second from 61 to 70 years of age and third from 71 years and above as. Among these 537 symptomatic persons 495 (92.18 %) persons said that they are suffering from lower urinary tract symptoms less than 5 times a day (mild) while 42 (7.82 %) complained their

lower urinary tract symptoms more than 5 times a day ( moderate to severe ) .

Among 1000 subjects, 820 male persons were included in first group which is 82 % of all the persons included in this study. The mean age of this group was  $53.87 \pm 2.46$  years. . Among these 820 subjects, 424 persons claimed that they were suffering from lower urinary tract symptoms (less than 5 times = mild and more than 5 times a day = moderate to severe ) which is 42.4 % of whole population studied (1000 subjects) and 51.7 % of this age group (820 subjects) and 78.96 % of all the symptomatic persons (537 subjects). Among these 424 symptomatic persons 403 (95.05 %) persons were suffering from mild symptoms while 21 persons (4.95 %) with moderate to severe symptoms.

Among 1000 subjects 166 male persons were included in the second age group which is 16.6 % of whole population studied. The mean age of this age group was  $63.66 \pm 2.38$  years. Among these 166 subjects 103 persons were reported to be suffering from lower urinary tract symptoms (ranging from mild to severe) which is 10.3 % of all the persons interviewed (1000 subjects) and 62.04 % of this age group (166 subjects) and 19.18 % of all the symptomatic persons (537 subjects). Among these 103 symptomatic subjects 86 (83.5 %) were with mild lower urinary tract symptoms while 17 (16.5 %) subjects were suffering from severe symptoms.

In this study only 14 persons appeared in third age group were included in this study (among 1000 subjects) which is 1.4 % of all persons included in the study. The mean age of this group was  $73.14 \pm$  years. Among 14 subjects 10 persons were suffering from lower urinary tract symptoms which is 1 % of whole of the population (1000 subjects) and 71.43 % of this age group (14 subjects) and 1.86% of all the symptomatic persons (537 subjects) included in the study . Among these 10 symptomatic people 06 (60 %) had mild while 04 (40 %) people were suffering from moderate to severe lower urinary tract symptoms.

Pearson's correlation co-efficient (  $r$  ) was calculated between all the subjects suffering from lower urinary tract symptoms and their age groups. The  $r$  value came to be + 0.72 which states that there is a perfect positive correlation between the variables. The significance of correlation was calculated by calculating t value which came to be 5.05. Entering the t table at 24 df we find that the

figure of 5.05 is more than 2.492. The figure of 2.492 indicates p value = 0.01 . This indicates that there is significant correlation between age groups and their lower urinary tract symptoms.

## DISCUSSION

Clinically diagnosed benign prostatic hyperplasia (BPH) is a common reason for surgery in elderly men [12]. The disease is thought to be more prevalent in the community among those whose lower urinary tract symptoms do not need any referral for surgery, but firm evidence to support this belief was lacking due to lack of research work on prevalence of lower urinary tract symptoms [5]. Since the World Health Organization (WHO) International Consultation Committee on BPH (benign prostatic hyperplasia) recommended estimating the incidence and prevalence of lower urinary tract symptoms secondary to benign prostatic enlargement in various populations worldwide [13], numerous studies from different countries have been reported. In these studies the prevalence of lower urinary tract symptoms is high and it increases with age [14].

The main purpose of this study was to evaluate the prevalence of lower urinary tract symptoms in elderly men of Pakistan. All the persons who participated in this study were divided into three groups according to their age. Prevalence of each age group was calculated. All the persons were interviewed, questions were well explained to them in their mother language and answers were recorded carefully. The study was conducted in the months of February and March. The weather is very pleasant in these months in Lahore thus minimizing the external environmental factor (hot or cold weather) which could affect the results.

Use of questionnaire is reliable for collecting data on symptoms and perceived health [15]. Questions on lower urinary tract symptoms were adopted from IPSS symptom index with addition of urge-incontinence which were translated in Urdu and Punjabi, as most of the persons could not understand English. The Urdu version of this symptom score is widely used in the country and easily available in printed form and well understandable by literate persons. The AUA-7 symptom index had been adopted by World Health Organization (WHO) as the international prostate symptom score (IPSS), after the addition of one question related with disease specific quality of life as a means of assessing the global impact of benign prostatic hyperplasia on quality of life [16].

On validation the AUA-7 index has shown excellent test-retest reliability and is internally consistent [17]. Moreover the AUA-7 index discriminates subjects with a clinical diagnosis of benign prostatic hyperplasia and control subjects and it is sensitive to change [17]. Although the AUA-7 index is not recommended as a screen for benign prostatic hyperplasia [18], symptom score have been used as pre-selection criterion in studies of the prevalence of benign prostatic hyperplasia [5].

Until 1990s most of the studies for lower urinary tract symptoms were based on selective populations [1] but most of the more recent surveys were based on representative samples of total population. In most of the studies the main purpose was to find out prevalence of lower urinary tract symptoms secondary to benign prostatic enlargement; hence only benign prostatic hypertrophy related symptoms were included in these studies. Subjects with history of prostatic cancer or surgery for symptomatic benign prostatic enlargement and those with history of other diseases affecting the lower urinary tract and causing similar symptoms were excluded from these studies [5].

Garraway et al [5] reported a high prevalence of lower urinary tract symptoms (91 %) in Scottish men and defined benign prostatic hyperplasia as an enlargement of the prostate gland equivalent to > 20 g in the presence of lower urinary tract symptoms and/or peak flow rate < 15ml/s and with no evidence of malignancy. The prevalence is much higher although 9 % of men were excluded from their study due to previous urinary tract disease, supraspinal cord lesion or pelvic radiation therapy. The subjects selected in this study were those who were already registered at health center. They had not excluded the known cases of benign prostatic hypertrophy and taking medical therapy or other systemic diseases such as diabetes mellitus etc. Moreover the validity of questionnaire used for this study is not certain because they did not mention clearly which questionnaire they used to collect the data.

Another study conducted by J. Koskimaki et al [14] on prevalence of lower urinary tract symptoms in Finnish men. This study showed the prevalence of single symptom among all the lower urinary tract symptoms was 89 %. A modified Danish prostatic Symptom Score System (DAN-PSS-1) questionnaire was used to collect the data. It was a postal survey of all the male citizens, above the

age of 50 years, of the city of Tampere (Finland) and 11 rural and semi rural municipalities. There was no specific exclusion criteria for this study. So in absence of any exclusion criteria no study can reach up to the mark of reliability.

E. Lea et al [18] conducted an epidemiological study in Korea and mentioned prevalence of moderate to severe lower urinary tract symptoms was 23.2 %. J. A. Chicharro-Molero et al [19] calculated the prevalence of moderate to severe lower urinary tract symptoms were 24.94 % in Spanish men. P. Trueman et al [20] mentioned prevalence of moderate to severe lower urinary tract symptoms were 41 %. In all these studies the prevalence of single lower urinary tract symptom is not mentioned.

No study on the prevalence of lower urinary tract symptoms in Pakistan was conducted or published in any national or international journal until this study.

The prevalence of single lower urinary tract symptom was high that is 53.7 % as in other population based studies. In our study the person were divided into three different age groups. The prevalence of first age group (51-60 years) was 51.7%, prevalence of second age group (61-70 years) was 62.08 % while prevalence of third age group (71 years and above) was 71.42 %. these results can well explain that prevalence of lower urinary tract symptoms increases with increase of age.

According to the severity of symptoms the persons were divided into two groups. First the persons who had symptoms less than five times a day (mild) and second who were suffering from lower urinary tract symptoms more than five times a day (moderate to severe). In the age group 51-60 years, 11.08 % were suffering from moderate to severe symptoms, in the age group 61-70 years, 24.27 % were suffering from moderate to severe symptoms while in the age group, 70 years and 30 % were suffering with moderate to severe symptoms. These findings are similar as in other epidemiological studies that had reported the age specific prevalence of moderate to severe urinary symptoms in men in Canada (15 %, 27 % and 31 % for each age group respectively) [21], the Netherlands (26 %, 30 % and 36 % in each group) [7], the USA (31 %, 36 % and 44 % in each age group) [22], Japan (18 % for 60-69 years and 26 % for 70 years and above) [5], France (8 %, 14 %, and 27 % for each age group) [23], Scotland (43 % for 60-69 years and 40 % for 70 years and above) [5], Denmark (18 % for 50-59 years and 23 % for

60-69 years) [24], Korea [18,28] as being 15-36 % in those 51-60 years, 27-41 % in those 61-70 years and 31-56 % in 71 years and above and 64.6 % in Austrian males in 15-89% age group [29]. No study, including this one, had correlated the symptoms with presence of urodynamically measured outflow resistance. All these studies indicate that the prevalence of moderate to severe lower urinary tract symptoms is  $\geq 30$  % before the age of 60 years and rises with increase in age.

The proportion of men reporting at least one bothersome urinary symptom was 34.7 % while 35.38 % symptomatic persons did not bother their urinary symptoms. Therefore it is important not only to consider the presence of lower urinary tract symptoms but also the bother that they cause [25]. Trouble caused by lower urinary tract symptoms may also help to define when the symptoms are abnormal and not just a habit or a result of the technical definition of a symptoms. The results of the present study support the finding of Jolleys et al [26] who reported that appreciable number of men with urinary symptoms do not consider them to be a problem.

The prevalence of all single symptoms increased with age. The nocturia was almost twice as common in third age group (70 years and above) as compared to first age group (51-60 years). This high dependence on age may be caused by several factors. It may reflect the difference in fluid excretion between 51-70 years old men; Kirkland et al [27] found that older subjects excreted more than half of their daily ingested fluid load at night, whereas younger people excreted only 25 % during the same period. The alteration of sleep pattern with age may contribute to the high prevalence of nocturia in 70 years old men. Nocturia once during sleeping hours may also be a habit for one man and a urinary symptoms for another reflecting the quality of sleep rather than the severity of the symptom [14,30]. Therefore to differentiate from habit to symptoms bother should be linked to this and other similar symptoms.

Comparison of prevalence of different lower urinary tract symptoms between the present study and other different studies is difficult because there are differences in study methodology, symptom definition, exclusion criteria and study sample as well as in the way the results were reported. In addition there may be cultural differences in the way that men perceive and report their lower urinary tract symptoms. A high prevalence of lower

urinary tract symptoms may indicate a high prevalence of benign prostatic enlargement but other causes are also involved. More research is needed to know the extent of lower urinary tract symptoms caused by benign prostatic enlargement, increasing age or other reasons.

## REFERENCES

- 1- Ball AJ, Fenelay RCL, Abrams PH. The natural history of untreated prostatism. *Br J Urol* 1981; 53: 613-6.
- 2- Guess HA. Epidemiology and natural history of benign prostatic hyperplasia. *Urol Clin North Am* 1995; 22: 247-61.
- 3- Birkhoff JD, Weiderhorn AR, Hamilton ML, Zinsser HH. Natural history of benign hypertrophy and acute urinary retention. *Urology* 1976; 7: 48-52.
- 4- Barry MJ. Epidemiology and natural history of benign prostatic hyperplasia. *Urol Clin North Am* 1990; 17: 495-507.
- 5- Garraway WM, Collins GN, Lee RJ. High prevalence of benign prostatic hypertrophy in the community. *Lancet* 1991; 338: 469-71.
- 6- Oesterling JE. Benign prostatic hyperplasia. Medical and minimally invasive treatment options. *N Engl J Med* 1995; 332: 99-109.
- 7- Simpson RJ, Fisher W, Lee AJ, Russel EB, Garraway M. Benign prostatic hyperplasia in an unselected community based population: a survey of urinary symptoms, bothersomeness and prostatic enlargement. *Br J Urol* 1996; 77: 186-91.
- 8- Bosch JL, Hop WC, Kirkch WJ, Schroder FH. Natural history of BPH: appropriate case definition and estimation of its prevalence in the community. *Urology* 1995; 46: 34-40.
- 9- Britton JP, Dowell AC, Whelan P. Prevalence of urinary symptoms in men over 60. *Br J Urol* 1990; 66: 175-6.
- 10- Fowler FJ Jr, Wennberg JE, Timothy Rp, Barry MJ, Mulley AG Jr, Hanley D. Symptom status and quality of life following prostectomy. *JAMA* 1988; 259: 3018-22.
- 11- Drummond MF, McGuire AJ, Black NA, Petticrew M, McPherson CK. Economic balance of treated benign prostatic hyperplasia in the United Kingdom. *Br J Urol* 1993; 71: 290-6.
- 12- Graves EJ. Detailed diagnosis and procedures, National Hospital Discharge Survey, 1987. National Center for Health Statistics, Washington DC. *Vital and Health Statistics* 1989; 13: 295.
- 13- Barry MJ, Beckley S., Boyle P. et al. Importance of understanding the epidemiology and natural history of BPH. In Cockett Atk, ASO Y, Chatelain C, Denis CL, Griffiths K, Khoury S, Murphy G, eds, *Proceedings of the International consultation on benign prostatic hyperplasia (BPH)*, Paris, June 26-27, 1991. Scientific Communication International, Paris. 1992: 11-22.
- 14- J. Koshimaki, M. Hakama, H. Huntala and T. L. J. Tammela. Prevalence of lower urinary tract symptoms in Finish men; a population based study. *B J U* 1998; 81: 364-369.
- 15- Aromaa A, Klaukukka T, Nyman K. Questionnaires and interviews in the measurement of the populations health. *J Soc Med* 1986; 23: 293-305.
- 16- Mebust W, Roizo R, Schroeder F, Villers A. Correlations between pathology, clinical symptoms and the course of disease. *Proceedings of the international consultation on benign prostatic hyperplasia*. Geneva; WHO, 1991: 51-62.
- 17- J. L. H. R. Bosch, W. C. J. Hop, W. J. Kirkels and F. H. Schroder. The international prostate symptom score in a community based sample of men between 55 and 74 years of age: Prevalence and correlation of symptoms with age, prostate volume, flow rate and residual urine volume. *B J U* 1995; 75: 622-630.
- 18- E. Lee, M. S. Park, C. Shin, H. Lee, K. Yoo, Y. Kim, Y. Shin, H. Y. Paiks and C. Lee. A risk group for prostatism; a population based epidemiological study in Korea. *B J U* 1997; 79: 736-41.
- 19- J. A. Chicharro-Molero, R. Burgos-Rodriguez, J. J. Sanchez-Cruz, J. M. Del Rosal-Samaniego, P. Rodero-Carcia and J. M. Rodriguez-Vallejo. Prevalence of benign prostatic hyperplasia in Spanish men 40 years old or older. *The Journal of Urology* 1998; 159: 872-882.
- 20- P. Trueman, S. C. Hood, U. S. L. Nayak and M. F. Mrazek. Prevalence of lower urinary tract symptoms and self-reported diagnosed benign prostatic hyperplasia, and their effect on quality of life in a community-based survey of men in the UK. *B J U* 1999; 83: 410-415.
- 21- Norman RW, Nichel JC, Fish D, Picket SN. Prostate-related symptoms in Canadian men 50 years of age or older; prevalence and relationships among symptoms. *B J U* 1994; 74: 542-50.

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- 22- Chute Cg, Panser LA, Girman CJ et al. The prevalence of prostatism: a population-based survey of urinary symptoms. *J Urol* 1993; 150: 85-9.
- 23- Sagnier PP, MacFarlane G, Richard P, Botto H, Teillac P, Boyle P. Results of an epidemiological survey using a modified American Urological Association Symptom Index for benign prostatic hyperplasia in France. *J Urol* 1994; 151: 1266-70.
- 24- Sommer P, Nielsen KK, Bauer T et al. Voiding patterns in men evaluated by a questionnaire survey. *B J U* 1990; 65: 155-60.
- 25- Peters TJ, Donovan JL, Kay HE et al. The International Continence Society 'Benign Prostatic Hyperplasia' Study: The bothersomeness of urinary symptoms. *J Urol* 1997; 157: 885-9.
- 26- Jolleys JV, Donovan JL, Nanchahal K, Abrams P. Urinary symptoms in the community: how bothersome are they? *Br J Urol* 1994; 74: 551-5.
- 27- Kirkland JI, Lye M, Levy DW, Banarjee AK. Patterns of urine flow and electrolyte excretion in healthy elderly people. *Br Med J* 1983; 287: 1665-7.
- 28- Lee YJ, Jeong SJ, Byun SS, Lee JJ, Han JW, Kim KW. Prevalence and correlates of nocturia in community-dwelling older men: result from the Korean longitudinal study on health and aging. *Korean J Urol* 2012 Apr;53(4): 263-7.
- 29- Haidenger G, Waldher T, Madersbacher S, Schatzl G, Vutuc C. Prevalence of lower urinary tract symptoms in Austrian males: Updates 2009. *Urol Int* 2011; 87(4): 385-91.
- 30- Charter-Kestler E, Leger D, Comet D, Haab F, Ohayan MM. Prostatic hyperplasia is highly associated with nocturia and excessive sleepiness; A cross-sectional study. *bmjopen* 2012 May 30; 2(3) 1-9.