The prevalence of dysuria in women in London

MARY WALKER, SRN, SCM J. A. HEADY, MA, PH.D A. G. SHAPER, FRCP, FRC.PATH, FFCM

SUMMARY. A postal questionnaire was used in a survey of dysuria in women aged 20–54 years in four London general practices. Twenty per cent of all women reported dysuria in the previous year (recent dysuria) and half of these women suffered at least one further episode in the same year. The prevalence of recent dysuria showed a decline with increasing age, a small increase with increasing number of pregnancies, no social class effect and no difference with marital status. Frequent recent episodes were more likely in women whose first reported episode of dysuria occurred before the age of 20 years. The risk of dysuria occurring in any pregnancy was about 12 per cent, and a small group—about 6 per cent of those who had had more than one pregnancy—reported dysuria in every pregnancy. Comparison of the practice records of non-responders and responders suggested that the true prevalence of recent dysuria was over-estimated by about one third. The routine use of a few specific questions in clinical and epidemiological practice may help to identify those women at increased risk from urinary tract infection, particularly in pregnancy.

Introduction

SYMPTOMS of urinary tract infection, particularly dysuria, occur commonly in women. Many of these episodes lead to a consultation with the general practitioner and it is customary to treat the problem with a course of antibiotics. The majority of these episodes respond satisfactorily to such treatment, whether or not bacteriuria is present. However, recurrence is not uncommon and in some women the condition is persistent, distressing and unresponsive to treatment. It is recognized that only a proportion of episodes of dysuria are seen by the general practitioner so that the real size of the problem is unknown. The present study set out to determine the current prevalence of dysuria in a population of women in London, with particular reference to factors associated with its frequent recurrence.

Mary Walker, Research Administrator; J. A. Heady, Reader in Medical Statistics; A. G. Shaper, Professor of Clinical Epidemiology, Department of Clinical Epidemiology and General Practice, Royal Free Hospital School of Medicine, London.

© *Journal of the Royal College of General Practitioners,* 1983, 33, 411-415.

Subjects and methods

Four group practices from the Royal Free Hospital General Practice Teaching Group participated in the study. Together they offered a total practice population of 30,000 on age and sex register cards, which was expected to yield 7,500 women aged 20–54 years. The practices were deliberately chosen from widely differing socio-economic areas, two in east London and two in north London. All the women born between 1925 and 1959 were identified from the age-sex registers, and early in 1979 they were sent a postal questionnaire and a letter signed by all the doctors in each practice, together with a reply-paid envelope. If no reply was received after three weeks, a second questionnaire and enclosure was despatched. When no reply was received from the two letters or when a letter was returned unopened, a search was made in the practice records for new addresses, and when these were available the mailing procedure was repeated.

The questionnaire was designed to be simple and brief, eliciting replies to a maximum of 10 questions. The first four related to age, occupation, marital status and number of pregnancies. The fifth question asked, 'Have you ever, at any time in your life, had discomfort, burning or pain on passing urine?' If a woman answered 'yes' to this question she was classified as having had dysuria. The last five questions depended on a positive reply to this key question and enquired about age of onset, frequency of symptoms, recent experience of the problem, consultation with a doctor and experience of symptoms during pregnancy. Questions on sexual activity and use of contraceptives were not included as we thought these would adversely affect the response rates and could eventually be included in more detailed studies. Since it was considered possible that there might be a higher response from women with symptoms than from those without, an outcome which would bias results based solely on an analysis of responders, a 20 per cent sample of non-responders from each practice was selected and matched for age within two years with an equal number of responders. A search was made in the practice records of these women for consultations in the 12 months before receiving the questionnaire, with specific concern for consultations relating to dysuria.

Results

Response to questionnaire

The practices, which differed considerably in size (Table 1), yielded a total of 7,719 women apparently eligible to receive a questionnaire. We deleted 95 subjects whose ages fell beyond the 20–54 years range and a further 991 whose letters were returned unopened and for whom no new address could be found. This reduced the study population to 6,633. The response rate based on this corrected denominator varied between the practices from 50–79 per cent, with an overall response rate of 62

per cent. Some characteristics of the 4,115 women who satisfactorily completed the questionnaire are shown in Table 1. The age distribution of responders in the four practices was similar: the proportion of the study women from each practice who were aged 20–39 years is given as an illustration. Twenty-seven per cent of the women were not married. Married women were classified according to the Register General's classification; non-manual (social classes I, II, III non-manual) and manual (social classes III manual, IV and V). There was a striking difference between the practices in this respect. There were minor differences between practices in the number of pregnancies the women had experienced.

Table 1. Response to questionnaire, classification of the respondents and the prevalence of previous and recent dysuria.

	Practices				
	1	2	3	4	Total
First mailing	3,169	1,371	1,795	1,384	7,719
Adjusted total*	2,929	1,114	1,671	919	6,633
Completed questionnaires	1,791	556	1,318	450	4,115
Response rate (percentage)	*61*	*50*	*79*	*50*	*62*
Percentage of women:					
Aged 20–39 years	*62*	*57*	*54*	*56*	*58*
Not married	*25*	*34*	*23*	*34*	*27*
Wives of manual workers**	*71*	*22*	*39*	*85*	*55*
Never pregnant	*25*	*34*	*27*	*24*	*27*
Percentage with previous dysuria	*53*	*49*	*52*	*50*	*52*
Percentage with recent dysuria	*22*	*18*	*17*	*22*	*20*

*After adjustment for errors in address and age.
**Married women only.

Table 2. Prevalence of previous and recent dysuria by social class, marital status, age and number of pregnancies.

Characteristics	Number of women	Previous dysuria (%)	Recent dysuria (%)
*Social class**			
Husband manual worker	1,669	*56*	*21*
Husband non-manual worker	1,308	*52*	*19*
Marital status			
Married	3,016	*54*	*20*
Not married	1,099	*44*	*19*
Age range			
20–29 years	1,178	*49*	*25*
30–39 years	1,207	*57*	*21*
40–49 years	1,107	*50*	*17*
50–54 years	623	*47*	*13*
*Number of pregnancies**			
None	1,106	*40*	*18*
One	694	*53*	*20*
Two	1,073	*57*	*20*
Three	617	*57*	*21*
Four or more	550	*61*	*23*

*Not-recorded categories are not included in this table.

Prevalence of dysuria

Overall, 52 per cent of the responders said that they had experienced the symptoms of pain, burning or discomfort on passing urine at some time in their lives (previous dysuria), and this figure was reasonably consistent in the four practices (Table 1). Twenty per cent of responders reported having had dysuria during the last 12 months (recent dysuria), and again the range between practices was small. Table 2 summarizes the findings on dysuria (previous and recent) against four personal characteristics of the women. There was little or no social class effect, no difference with marital status in recent dysuria, but a higher prevalence of previous dysuria in the married women. There was no consistent age-trend in those reporting previous dysuria but a peak prevalence (57 per cent) in the 30–39 year old women. There was a steadily declining prevalence of recent symptoms with increasing age, from 25 to 13 per cent. Women who had experienced no pregnancies had a lower prevalence of previous dysuria; nevertheless this figure was 40 per cent, and there was a rising trend with increasing numbers of pregnancies. The prevalence of recent dysuria showed only a slight but significant increase with increasing number of pregnancies.

Frequently recurring dysuria gave particular concern. We found that 27 per cent of all women had experienced three or more episodes in their lives and 6 per cent had experienced three or more episodes during the previous 12 months (Table 3). When the women who had ever had dysuria (2,125) were analysed by age at first onset of their dysuria, those who first experienced symptoms before the age of 20 years had the highest rate (17 per cent) of recent repeated (three or more) attacks (Table 4).

With the known high risk of pyelonephritis in women who have urinary tract infection in pregnancy, it was important to identify the prevalence of symptoms during pregnancy (Table 5). Of the 2,934 women who had experienced at least one pregnancy, 567 (19 per cent) had suffered dysuria during at least one pregnancy. As one would expect, women who had experienced more than one pregnancy reported dysuria in at least one pregnancy more often than those who had had only one pregnancy.

It is of greater interest to examine the percentage of women who had experienced dysuria in all their pregnancies; it is a much higher rate than would be expected if the risks in successive pregnancies were unrelated (Table 5). Overall, these 2,934 women recorded 6,906 pregnancies, and 927 (13 per cent) of these were

Table 3. Frequency of episodes of dysuria for all women in the study.

	Number and percentage (%) of all women with given number of episodes						
Dysuria	0	1	2	3	≥4	Not recorded	Total
Previous	1,990 (48)	525 (13)	417 (10)	289 (7)	829 (20)	65 (2)	4,115 (100)
Recent	3,249 (79)	380 (9)	201 (5)	87 (2)	147 (4)	51 (1)	4,115 (100)

Table 4. Age at first onset of symptoms in women with previous dysuria.

Age at first onset of dysuria (years)	Number with previous dysuria	Percentage with ≥3 recent episodes	
Under 15	151	19	17
15–19	477	16	
20–24	639	8	
25–29	293	6	
30 or more	481	10	
Not recorded	84	—	
Total	2,125	11	

Table 5. Dysuria in pregnancy.

Number of pregnancies	Number of women	Percentage with dysuria in at least one pregnancy	Percentage with dysuria in all pregnancies
One	694	12	12
Two	1,073	15	6
Three	617	26	6
Four or more	550	29	7*
Total	2,934	19	7

*Approximate.

complicated by an episode of dysuria. This latter finding, coupled with the 12 per cent prevalence in women having only one pregnancy, suggests that the risk of any pregnancy being complicated by dysuria is about 12–13 per cent.

We also analysed the data for women having dysuria in all pregnancies (excluding first and only pregnancies) to see whether age at first onset of dysuria was a factor in determining recurrence in subsequent pregnancies. We could find no evidence to support this concept.

Investigation of non-responders

The practice records of the sample of non-responders were twice as likely to be missing as were those from the matched sample of responders, and twice as many non-responders had not visited the doctor in the previous 12 months (Table 6). These findings suggest that a proportion of non-responders had left the address known to the practice or were no longer registered with the practice. The figures can be used to find the extent of the bias in the estimation of the prevalence of recent dysuria. At one extreme one can assume that the six recent episodes among the 384 non-responders were all that occurred in these women, or, at the other extreme, one can assume that the difference (115) between responders and non-responders in the number with 'no notes found' or 'not seen by the doctor for 12 months' was entirely due to women who had left the practice. The first assumption gives a recent prevalence for non-responders of 6/384 (1.6 per cent) and the second of 6/269 (2.2 per cent)—that is, both assumptions approximate 2 per cent to be compared with the 'recent'

Table 6. Characteristics of the 20 per cent sample of non-responders from each practice compared with a matching number of responders.

	Non-responders	Responders
Total	384	384
No notes found	120	61
Not seen by doctor for 12 months	118	62
Seen by doctor in 1979 with no UTI	140	238
UTI recorded in 1979	6	23

UTI = evidence of urinary tract infection in practice records.

prevalence in responders of 23/384 (6 per cent). This supports the suggestion that women who responded to the questionnaire were more likely to have suffered from dysuria than non-responders. To quantify the effect that a bias of this magnitude would have on the estimate of prevalence derived from the answers to the questionnaires, it is necessary to assume that the same proportionate bias (that is, 3:1 in responders compared with non-responders) would apply to both the questionnaire and to the doctor's record of attendance. On this assumption, and using the figure of 62 per cent response to the questionnaire, it can be calculated that the 'recent' prevalence of 20 per cent derived from the completed questionnaire would be reduced to 15 per cent for all women including non-responders. In other words, the questionnaire response may be overestimating the true prevalence by about one third. It must be emphasized that this calculation is based on relatively

small numbers and therefore the measure of overestimation is only approximate.

Consultations

An interesting byproduct of the above comparison of responders and non-responders relates to consultations. The question 'Have you ever consulted your doctor for the problem?' was answered in the affirmative by 78 per cent of those who reported previous dysuria. This figure varied little from practice to practice or with age, number of pregnancies or social status.

As mentioned above, the case records of responders and non-responders showed that 23 of the 384 responders (6 per cent) had visited the doctor for dysuria in the previous year, compared with the 20 per cent prevalence of recent dysuria reported in the questionnaire.

Discussion

This study describes the prevalence of dysuria in women in four London general practices and relates it to several characteristics considered relevant to its distribution. We obtained information quickly and economically by postal questionnaire in an attempt to identify high-risk groups which could later be studied in greater detail. The only other British study of the prevalence of symptoms of urinary tract infection in women was carried out in 1967 in a defined area of the Rhondda Valley in south Wales.[1] In that study, trained interviewers administered a questionnaire to women aged 20–64 years, and those who were unwilling or unable to come to the survey centre were later visited at home. It is not surprising that a survey in a homogenous stable community resulted in a higher response rate (86 per cent) than that obtained by a postal questionnaire sent to women living in a variety of London boroughs, where the situation is complicated by language difficulties, local rehousing programmes and the large number of young, single women who are relatively mobile.

Response rates and possible bias

In deciding to present this information despite the relatively low response rate, several factors have been taken into account. First, the study included an examination of non-responders, and the data suggest that about one third of the sample of non-responders had left the address known to the practice. Exclusion of these subjects from the denominator gives an improved response rate of about 70 per cent. This mobile group is likely to be biased in its composition towards the young non-married women, and the possible effects of this bias will be discussed in the appropriate sections.

Second, our examination of the patients' records suggests that those who replied to the postal questionnaire are about three times more likely to have presented to their doctors with dysuria than those who did not reply. Thus a prevalence rate based on responders is likely to overestimate the true prevalence of dysuria in the community, and the information from Table 6 enables us to make an approximate correction to the overall prevalence rate. Similarly, as we have direct evidence regarding response rates by age, we are able to examine in detail the effects of bias in relation to age. For examining the possibility of bias owing to marital status, social class and pregnancy, however, we have only indirect evidence drawn from the different response rates between practices.

Prevalence of dysuria

The prevalence of both previous dysuria and recent dysuria was remarkably similar in the four general practices despite widely differing response rates and socio-economic status. The two practices with the lowest response rates had the greatest disparity in social class but they were identical in having the highest proportion of non-married women. This suggests that there probably is a higher response in married women but no bias in response associated with social class.

It seems likely that the most useful measurement of dysuria relates to the previous 12 months—recent dysuria. This reduces recall problems which could differ between the various age groups, and it eliminates bias due to varying lengths of exposure to risk.

Age. Response rate was related to age, but the difference from the overall prevalence is of importance only in the older age group (50–54 years). We have therefore re-examined the downward trend in the prevalence of recent dysuria with increasing age, taking into account the higher response rate in older women and the higher rate of dysuria in responders. Recalculation has little effect on the downward trend with increasing age. This steady decline in recent dysuria with increasing age is consistent with the hypothesis relating sexual activity and urinary tract infections.

Marital status. In this study virtually no difference was observed in the prevalence of recent dysuria between married and not-married women. We have, however, shown that, because non-responders have a lower prevalence of recent dysuria than responders, the estimates of prevalence from this postal survey are likely to be higher than the true prevalence. It also appears from comparison of response rates in the four practices that not-married women have lower response rates than married women. The rates for not-married women are therefore likely to provide a greater overestimation of their true prevalence than the rates for married women. Correction for this bias would increase the observed gap between the rates and bring our findings more into agreement with the south Wales study,[1] in which married women had higher rates than the never-married women. It must be emphasized that in south Wales women were classified as married or never-married. In the London study, the not-married women include those who have never married as well as those who are divorced, separated or 'living with someone'.

Social class. Classification was only possible for the married women, and among these there was no difference in the prevalence rates of previous dysuria or recent dysuria between the wives of manual and the wives of non-manual workers, nor any apparent response bias. Most reports relating to socio-economic status and urinary tract infection are concerned with bacteriuria in pregnancy. A study of pregnant women in Seattle, carried out some 20 years ago, showed that asymptomatic bacteriuria at the time of delivery was more common among women of low socio-economic status regardless of race, and was particularly common among multigravidae of low socio-economic status.[2] The Seattle study is frequently referred to in support of the suggestion that socio-economic status is an important factor in urinary tract infection. A connection is made between low socio-economic status, poor hygiene and the 'dirty perineum' theory of the pathogenesis of urinary tract infection.[3] However, a review of the few studies which do consider socio-economic status as a possible factor does not provide any support for this hypothesis.[4]

Pregnancy is a period of particular concern as some 30 per cent of pregnant women with bacteriuria, if untreated, may develop acute pyelonephritis.[5] In both the London and the south Wales studies, pregnancy and childbearing did not appear to play an important role in determining the prevalence of dysuria. The London findings suggest that the risk of any pregnancy being complicated by dysuria is 12–13 per cent, not different from what one would anticipate from the 20 per cent prevalence rate in a 12-month period. However, of the women with more than one pregnancy the 6 per cent who reported dysuria in every pregnancy probably constitute a high-risk group in whom detailed investigation is of considerable importance.

Consultations

Examination of the case records of a sample of the responders showed that 6 per cent had visited the doctor with dysuria in the previous year, compared with the 20 per cent prevalence rate for recent dysuria in all responders. This suggests that doctors are seeing only a minority of symptomatic episodes. In the south Wales study, the younger women (20–39 years) with recent dysuria were more likely to have consulted their doctor about this symptom than the woman aged 40–64 years (54 per cent versus 37 per cent). It is possible that women consult their doctors in the early stages of the natural history of urinary tract infection but later in life they either learn how to deal with the problem or how to live with it.

Frequent recurrence

There appears to be a consensus of opinion at present that most urinary tract infections are benign even if distressing. In adults, progression of untreated or inadequately treated urinary tract infection to renal disease, hypertension and renal failure is extremely rare in non-pregnant women.[6] We should therefore be concerned particularly with urinary tract infection in pregnancy and with frequently recurring infections. The latter not only expose women to repeated courses of chemotherapeutic agents but may indicate some underlying susceptibility to urinary tract infection and possibly to renal damage.

Our findings suggest that a few critical questions routinely used in general practice, hospital clinics or epidemiological studies would identify those women at increased risk from urinary tract infections. Any woman who has had two or more episodes of dysuria within 12 months requires detailed investigation. Any woman who has had dysuria in two or more successive pregnancies should be frequently checked for bacteriuria during pregnancy and investigated for abnormality of renal tract structure or function. A case-control study of symptomless (covert) bacteriuria[7] showed that symptoms in the preceding year were about four times as common in those with bacteriuria as in control subjects. Asscher[3] considers that 'it is not lack of symptoms but failure to report symptoms which make bacteriuria "asymptomatic".' Clearly it is necessary, in general practice and in antenatal clinics, to ask direct questions routinely about recent dysuria, as our study, in agreement with other studies, indicates that only a proportion (possibly one third) of episodes of dysuria in the community result in a visit to the doctor.

References

1. Waters WE. Prevalence of symptoms of urinary tract infection in women. *Br J Preventive Soc Med* 1969; **23:** 263-266.
2. Turck M, Goffe B, Petersdorf RG. Bacteriuria of pregnancy. Relation to socio-economic factors. *N Eng J Med* 1962; **266:** 857-860.
3. Asscher AW. *The challenge of urinary tract infection.* P60 London: Academic Press, 1980.
4. Williams JD, Reeves DS, Cordie AP, *et al.* Significance of bacteriuria in pregnancy. In: *Infection of the urinary tract.* Kass EH, Brumfitt W (Eds). Pp 8-18. Chicago: University of Chicago Press.
5. Williams JD, Reeves DS, Brumfitt W, *et al.* The effect of bacteriuria in pregnancy on maternal health. In: *Urinary tract infection.* Brumfitt W, Asscher AW (Eds). Pp 103-107. Oxford: Oxford University Press.
6. Asscher AW. Urinary tract infection. *J R Coll Physicians Lond* 1981; **15:** 232-238.
7. Sussman M, Asscher AW, Waters, WE, *et al.* Asymptomatic bacteruria in the non-pregnant woman. 1: Description of population. *Br Med J* 1969; **1:** 799-803.

Acknowledgements

This study was supported by a grant from the North-East Thames Regional Health Authority. We are grateful to Drs John Cohen, Gerald Gould, Bernard Taylor, Theresa Turk and their practice staffs for their collaboration. Melanie Bartley and Bronwen Youard provided essential help in the processing and analysis of the data, and Margaret Tebble was responsible for the computer programming.

Address for correspondence

Professor A. G. Shaper, Department of Clinical Epidemiology and General Practice, The Royal Free Hospital School of Medicine, Hampstead, London NW3 2PF.