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Urinary Tract Infection in Primary Health Care in Northern Sweden

II. Clinical Presentation

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In a multipractice prevalence study of uncomplicated urinary tract infection (UTI) in primary health care (PHC), with 355 episodes in 302 individuals during one month, 93 % of the episodes occurred in females and *Escherichia coli* was the dominating causative organism (77 %). Most episodes of UTI (84 %) were acute and associated with lower (75 %), upper (5 %) or uncharacteristic symptoms (4 %) whereas 16 % represented bacteriuria discovered by posttreatment controls. Urgency (77 %) and dysuria (70 %) were the most common symptoms. Loin pain was highly associated with upper UTI (88 %) but was reported also in 23 % of episodes of lower UTI. Patient's delay differed between PHC centres and patient categories and was surprisingly long, four weeks in nine per cent and on average 8.4 days.

Key words: urinary tract infection, primary health care, clinical presentation.

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Additional to an epidemiological description of urinary tract infection (UTI) in primary health care (PHC) (1) a comprehensive account of community acquired UTI should also include symptoms and the natural course of the disease. The latter is, however, difficult to study because severe symptoms require immediate relief. Nevertheless, available data indicate that asymptomatic bacteriuria (ABU) may be rather permanent while symptomatic lower UTI (SBU) tends to heal spontaneously (2, 3, 4, 5). Prolonged patient's delay may lead to disappearance of UTI symptoms and increased probability of self-healing (4). Apparently, both symptoms and patient's delay are regarded trivial in UTI and therefore remain poorly described in the literature and in modern textbooks of medicine.

Aim of study

The aim of this work was to describe the clinical presentation of uncomplicated community acquired UTI in different parts of the county of Västerbotten in northern Sweden with particular emphasis on symptoms and patient's delay.

MATERIAL AND METHODS

In 1981 local guidelines for the management of PHC patients with UTI were established for the county of Västerbotten (6). In a multicentre study (McPHC) during one month (September-October 1982) 17 PHC centres (PHCCs) distributed throughout the county participated in an evaluation of the UTI management program, a part of which is reported here.

Most consultations because of suspected UTI or control after UTI therapy were included in the study.

Using a questionnaire the spectrum of symptoms, their duration and earlier urinary tract problems were carefully recorded.

Patients with dominating symptoms from prostatitis or testicles (prostatitis) or vagina (gynaecological disorder) were excluded. Also indwelling urethral catheter, urinary incontinence requiring other aids (uridome or diapers) and earlier institutional care within one month lead to exclusion of the patient.

Patients with unbearable urinary tract symptoms

Table I. Distribution of UTI episodes (n=355) in 302 patients in patient categories

Category	Episodes		
	Total		Males (%)
	n	%	
I (lower UTI)	266	75	5
II (upper UTI)	17	5	6
III (posttreatment control)	59	16	19
IV (miscellaneous UTI)	13	4	8
All categories	355	100	7

were promptly taken care of while the remaining patients were asked to wait until the following day and to bring a midstream sample of morning urine (minimum six hours bladder incubation, if possible) collected without pre-washing the vulva or glans penis.

Dip-slide urine cultures (Uricult, Orion Diagnostics) were inoculated, incubated and inspected at each participating PHCC. Those judged to yield significant growth (see below) were placed in padded envelopes and mailed to the county bacteriological laboratory in Umeå for control reading, identification and drug resistance testing of organisms by standard methods. A clinically significant difference between dip-slide bacterial counts read by PHC personnel and by two specially trained laboratory technicians was recorded in three per cent of the UTI episodes studied (manuscript in preparation).

Definitions

UTI was defined as asymptomatic (ABU) or symptomatic (SBU) bacteriuria with $\geq 10^5$ gram-negative or $\geq 10^4$ gram-positive bacteria per ml urine according to the readings of dip-slide cultures by technicians at the county bacteriological laboratory.

The bacteriuric patients were grouped as follows: I. Lower SBU (cystitis or urethritis). II. Upper SBU (pyelonephritis): fever $\geq 38.5^\circ\text{C}$ or tenderness (by bimanual palpation or throbbing) over one or both kidneys, or specific urine sediment findings. III. Posttreatment control. IV. Miscellaneous UTI (ABU, foul smelling urine, vague or uncharacteristic abdominal symptoms, systemic symptoms like unexplained fever etc).

Posttreatment controls were routinely performed

one to three days and three to four weeks after therapy. A patient who had marked UTI symptoms at the first control or who returned earlier than initially planned because of symptoms was again recorded as an episode of SBU (category I or II) and not as control visit (category III).

Differences were tested for significance using the Chi-square method.

RESULTS

The McPHC study comprised 355 episodes of UTI (SBU or ABU) in 302 individuals (Table I). There was a peak of UTI episodes among patients aged 20–29 years and again in decades ≥ 6 . Male UTI seldom occurred before the age of 60 years (Table II).

About 70% of the patients had not suffered from UTI during the previous 12 months while 20% had experienced three episodes of UTI or more. Fifteen per cent of the episodes represented "early recurrence" (within one month posttherapy). *Escherichia coli* was the dominating causative organism (77%) followed by *Staphylococcus saprophyticus* (7%).

Episodes of lower SBU were dominating (75%) (Table I) whereas the incidence of upper SBU was only five per cent. As many as 16% of the UTI episodes were discovered by posttherapy controls. In this category male episodes were more common (19%) than in the other categories (5–8%) (Table I). The differences between males and females in distribution of patient categories were highly significant ($p < 0.001$).

Clinical presentation

By definition all episodes in patient categories I and II were symptomatic (Table III). In contrast, 79% in category III and only 20% in category IV were associated with symptoms. Nevertheless, the vast

Table II. Age and sex distribution of patients with episodes of UTI

	Decade ^a										Total
	1	2	3	4	5	6	7	8	9	10	
Episodes, n	4	25	59	38	27	52	68	69	7	6	355
Males, %	0	0	2	0	4	0	10	19	0	50	7

^a Decade 1: 0–9 years, 2: 10–19 years etc.

Table III. Distribution of symptoms among four categories of UTI patients in per cent of episodes

Category I: lower UTI, II: upper UTI, III: posttreatment control, IV: miscellaneous UTI

Symptom	I (n=260)	II (n=17)	III (n=48)	IV (n=13)	All categories (n=338)
Urgency	82	65	71	0	77
Dysuria	76	71	56	0	70
Nightly symptoms	61	71	51	8	58
Foul smell ^a	56	53	47	62	55
Chills	45	65	30	15	43
Incontinence	36	50	31	0	35
Loin pain	23	88	17	17	25
Discharge/itch	19	25	20	15	19
Macroscopic hematuria	17	19	7	17	16
Vague or no symptoms	0	0	21	80	8

^a Episodes with foul smelling urine only were classified as asymptomatic bacteriuria, i.e. category IV.

majority of UTI episodes were associated with symptoms (92%) ranging from urgency in 77% to macroscopic hematuria in 16% of the episodes (Table III). In as many as 35% of the episodes the patient suffered from urinary incontinence. About one fifth had genital discharge and/or itch as additional symptom.

Loin pain was the symptom showing the highest sensitivity (0.88) for high SBU. Chills were less associated with upper SBU than loin pain (sensitivity 0.65) whereas body temperature usually was unknown to the patients and therefore was missing on many questionnaires. Surprisingly, loin pain was reported also in as many as 23% of episodes classified as lower SBU.

Except for urgency the spectrum of UTI symptoms reported depended somewhat on the age of the patient (Table IV). Distal symptoms (discharge/itch, dysuria, macroscopic hematuria), and loin pain were most frequent among patients less than 50 years of age. On the other hand, foul smelling urine, nightly symptoms and urinary incontinence tended to increase by age.

Patient's delay

In about 12% of UTI episodes the patient contacted the PHCC within 24 h after onset of symptoms. This is defined as no delay (Fig. 1). On each of the following five days about nine per cent of the patients consulted PHC. Thus, in 56% of the episodes the delay was five days or less. In 35% the delay was six days to four weeks (2.5–0.6% of patients contacted on each day) and in as many as nine per

cent of the episodes the patient's delay exceeded four weeks. The mean delay at different PHCCs ranged between 5.3 and 12.2 days (Fig. 2) with an average delay of 8.4 (standard deviation 11.7) days. There was no evident difference in patient's delay between urban, country-side and mountain area populations.

The patient's delay tended to be shorter in young and in very old UTI patients than in the age groups between 40 and 69 years (4.5, 5.8, 6.4, 8.7, 11.3, 11.0, 9.3, 4.3 and 2.3 days in decades 2–10, respectively). The mean delay was slightly shorter in high than in low SBU (6.4 vs. 8.7 days) but surprisingly shortest in patients in category IV (3.6 days). Various underlying factors contributing to patients' delay were not analyzed.

Table IV. Distribution of symptoms among different age groups of UTI patients in per cent

Symptom	10–49 yrs	50–69 yrs	70–99 yrs
	(n=142)	(n=119)	(n=77)
Urgency	79	75	76
Dysuria	81	66	57
Nightly symptoms	54	56	70
Foul smell	44	65	59
Chills	41	42	31
Incontinence	25	44	41
Loin pain	32	22	20
Discharge/itch	27	14	14
Macroscopic hematuria	26	11	5

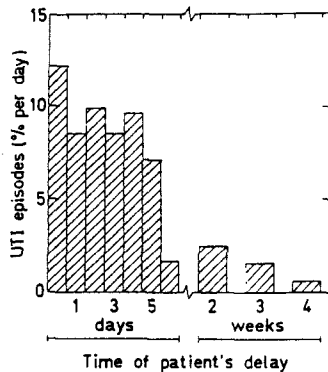


Fig. 1. The UTI patient's delay in primary health care. In nine per cent of the episodes ($n=355$) the delay exceeded four weeks.

DISCUSSION

Due to the exclusion of patients with indwelling catheter or urinary incontinence and those who were or had been institutionalized within one month the McPHC material mainly represents uncomplicated UTI in different PHC populations (urban, country-side and mountain area). This may explain the high incidence of cystitis (75%) and low incidence of pyelonephritis (5%) compared with unselected PHC (56 and 12%, respectively) (1).

As generally found in studies of UTI the percentage episodes in male patients raised sharply after middle age (1, 3) peaking in the 8–10th decades. However, episodes in males comprised on average only seven per cent which was less than in our study of unselected PHC (13%) (1) and in other recent Swedish studies (7, 8). Also this difference is probably due to the exclusion of certain patients from the present study. The increased proportion of male episodes among patients bacteriuric at post-treatment controls (19%) indicated that males were more disposed to contract complicated infections with treatment failure, recurrences and chronic UTI.

As expected, most episodes of UTI were symptomatic and the classical symptoms urgency and dysuria were the most frequent. Patients aged 10–49 years reported more symptoms apparently related to tissue involvement of the distal urinary tract than older patients (e.g. 26% versus 5% hematuria) (Table IV). Young UTI patients suffered from urinary incontinence in as many as 25% of episodes and presumably due to anatomical and functional factors this problem rose to more than

40% among older UTI patients. The incidences of UTI symptoms differed considerably between PHCCs. This may reflect the local differences in patient's delay (5.3–12.2 days). Since symptoms among abacteriuric patients were not recorded specificity and predictive values of each symptom could not be calculated.

Loin pain was the symptom showing the highest sensitivity for high SBU (0.88) as here defined by tenderness by bimanual palpation or throbbing over the kidney(s). However, loin pain was reported also by 23% of the patients with low SBU and the overall incidence of loin pain recorded was five-fold that of high SBU diagnosed (25% vs. 5%). This illustrates that the incidence of clinical pyelonephritis depends on its definition and that the use of loin pain as the sole indicator may lead to overdiagnosis. In a Danish study of UTI in PHC (9) loin pain plus fever was defined as upper UTI and resulted in 18% pyelonephritis whereas in our study of unselected PHC patients fever and/or tenderness over the kidney(s) was required resulting in only 12% pyelonephritis (1). It is thus possible that loin pain often reflects referred bladder pain only rather than upper UTI.

Both the general length of the UTI patient's delay (> four weeks in nine per cent and on average 8.4 days) and the differences in delay between patient categories, age groups and PHCCs were surprising. Due to the limited number of UTI episodes per PHCC studied part of the differences between PHCCs could be fortuitous (Fig. 2). Presumably, patient's delay depended on symptoms, patient habits as well as on local routines for management of patients with urinary tract problems. The county UTI management guidelines recommend prompt care of patients with unbearable symptoms, whereas other patients were asked to wait until the fol-

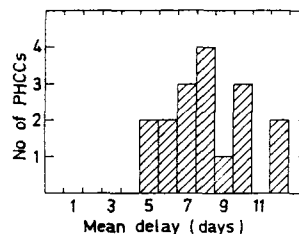


Fig. 2. Mean delay of UTI patients at 17 different primary health care centres. The average delay was 8.4 days (standard deviation 11.7 and range 5.3–12.2 days).

lowing morning for optimal bladder incubation of urine before analysis. For some patients the latter procedure could have contributed one day (two days on week-ends) to patient's delay. Thus, the true patient's delay was on average about one week, which was longer than we had expected. The major causes of patient's delay and its possible positive and negative clinical consequences remain to be elucidated.

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