

The Appropriate Use of Diagnostic Services :

(xii) Investigation of Urinary Infections in General Practice :

are We Wasting Facilities ?

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INTRODUCTION

Although urinary infection is among the most common of bacterial infections understanding of the aetiology is rudimentary and needs further research. Infections seen in general practice are widely misunderstood and are often regarded by the medical profession and public alike as being of trivial importance.

Urinary infection is a manifestation of a number of well-defined clinical entities not all of which can be dealt with in the same way. Examples of specific patient groups encountered are schoolgirls, pregnant women, males, the elderly, and female patients with recurrent infections (sometimes over many years). However, most common are patients with uncomplicated dysuria and frequency. Such patients are usually treated by the general practitioner (gp), possibly supported by hospital resources. This article will consider how laboratory and clinical facilities can best be applied to the management of the latter type of patient.

THE PROBLEM OF DYSURIA

In patients with urinary infection the most common presenting symptoms are dysuria and frequency. Dysuria is the more distressing symptom. However, as we shall show not all dysuria is due to urinary infection and urinary infection is not always associated with dysuria.

Various recent surveys in England and Wales have indicated that between 5 and 20% of women experience dysuria each year.^{1,3} Assuming that this number is correct as many as two and a half million women experience dysuria every year in the United Kingdom. In the United States dysuria accounts for six million office visits each year⁴. A substantial but uncertain number of these sufferers do not go their gp for help.³ If they do it is likely that the latter will prescribe a seven to ten day course of antibiotics, typically costing between £3 and £4 for one week's supply (250 mg amoxycillin three times daily or 2 tablets of cotrimoxazole twice daily). Thus if all patients with dysuria were treated the cost would exceed six and a half million pounds.

It is clearly unsatisfactory to prescribe antibiotics for patients who have no infection. Cost is not the only important factor : side-effects and the dissemination of resistance due to inappropriate antibiotic use must be considered.⁵ The difficulty lies in determining which patients have an infection which require laboratory facilities. However, this must be balanced against the cost of using antibiotics in uninfected patients and the limited capacity of laboratories to carry out investigations rapidly. Also of importance to the gp in his surgery when faced with a distressed patient, is that the result of laboratory tests usually takes at least 24 hours and often much longer.

The highest estimates show that only 50% of women suffering from dysuria and frequency have a urinary infection.⁶ Most infections in general practice are due to *Escherichia coli*. The remaining 50% of patients have a condition clinically similar but unassociated with significant bacteriuria which has been given a variety of names such as "cystitis"

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or "urethral syndrome". Several causative agents (microbiological and non-microbiological) have been suggested for this condition (Table 1). Also,

<i>Microbial</i>	<i>Non-microbial</i>
Bacterial vaginosis	Psycho-physiological reactions
Chlamydia trachomatis	— anxiety
Neisseria gonorrhoeae	— hysteria
Genital herpes	— hypochondriasis
Trichomonas vaginalis	Trauma
Gardnerella vaginalis	Sphincter spasm
Candida albicans	Chemical irritation

infections such as chlamydia, gonococci, genital herpes and vaginitis can cause dysuria and frequency and be mistaken for urinary infection. How often these infections cause dysuria is disputed but in the family practice available evidence indicates that they are unusual (e.g. *Chlamydia trachomatis* has been

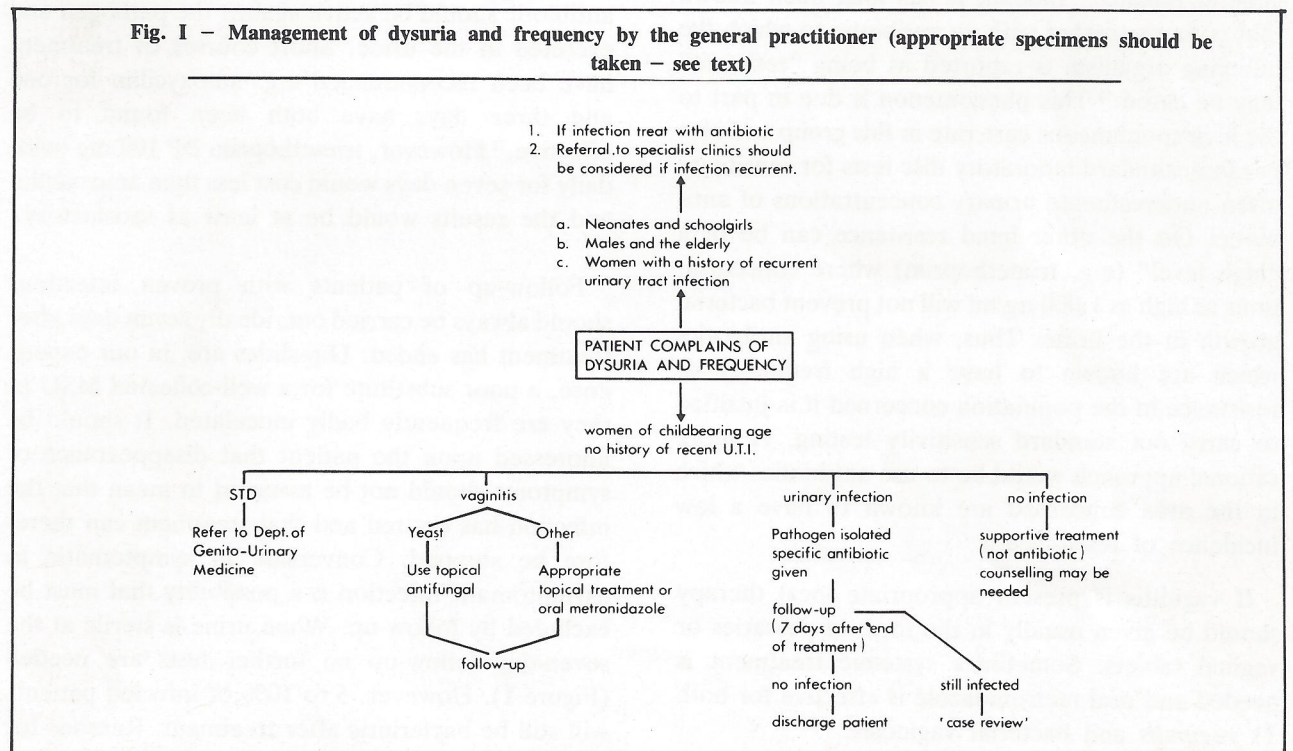
said to be a common cause but a recent study has not substantiated this claim⁷). If a venereal cause is suspected accurate diagnosis is essential and this requires referral to a department of genito-urinary medicine (Figure 1).

VAGINITIS

The presence of *Trichomonas vaginalis* or bacterial vaginosis (including *Gardnerella vaginalis*) can be suspected clinically and confirmed by simple and rapid tests. The characteristic appearance, odour and pH of the discharge supplemented by the amine test help to differentiate these conditions from candidiasis. *T. vaginalis* is easy to recognise by microscopy but *G. vaginalis* is not and usually requires the help of the laboratory.

Komaroff and colleagues⁸ have found that a diagnosis of "vaginitis" in a patient with dysuria and/or frequency is common. This has not been the experience in the United Kingdom. If tests available in the surgery indicate a vaginitis a high vaginal swab should be taken, put into suitable transport medium and sent to the laboratory for diagnosis. Results should be available soon after the specimen arrives in the laboratory. It is useful also to send a properly taken mid-stream urine (MSU), free from contamination by the discharge.

Fig. 1 - Management of dysuria and frequency by the general practitioner (appropriate specimens should be taken - see text)



URINARY INFECTION

If true urinary infection is suspected a MSU should be taken and sent to the laboratory for culture and sensitivity testing. The gp can take several immediate steps to decide whether the urine is infected. Simple microscopy on a drop of urine together with use of an appropriate reagent strip can be helpful in deciding whether or not infection is present. If white cells are absent, culture is needed. Infection in a symptomatic patient is unlikely in the absence of pyuria but it must be stressed that the only definite proof of absence of infection is the finding of no significant bacterial growth.

IMMEDIATE TREATMENT

If urinary infection is suspected but symptoms are bearable antibiotics should be withheld pending the results of culture. In such patients increased fluid intake together with alkalinisation of the urine often alleviates symptoms. In such circumstances it is essential that the laboratory issues a report on the day after the specimen is received. Delayed reports are useless and a waste of money but are all too common. Identification of the pathogen is unnecessary for diagnosis and should not delay issuing the report. It has been suggested that sensitivity testing need not be done on organisms isolated from patients with "simple" dysuria and frequency in general practice.⁹ Indeed, it has long been known that patients treated with an antibiotic to which the infecting organism is reported as being "resistant" may be cured.¹⁰ This phenomenon is due in part to the high spontaneous cure rate in this group and also because standard laboratory disc tests for sensitivity often underestimate urinary concentrations of antibiotic. On the other hand resistance can be of a "high level" (e.g. trimethoprim) where concentrations as high as 1,000 µg/ml will not prevent bacterial growth in the urine. Thus, when using antibiotics which are known to have a high frequency of resistance in the population concerned it is justified to carry out standard sensitivity testing. A more rational approach would be to use antibiotics which in the area concerned are known to have a low incidence of resistance.

If vaginitis is present appropriate local therapy should be given usually in the form of pessaries or vaginal tablets. Sometimes systemic treatment is needed and oral metronidazole is effective for both *T. vaginalis* and bacterial vaginosis.

Occasionally patients require urgent treatment. Fever, rigors, loin tenderness or other signs indicative of renal involvement or where severe dysuria and suprapubic pain are unbearable require immediate treatment on a "best-guess" basis.

For less severe infections several points must be borne in mind :

1. At least half the patients do not have an infection and do not benefit from antibiotic therapy but may get side-effects.
2. In a further half of those who do have an infection spontaneous cure occurs in 72 hours. Unhappily no test is available to detect those patients whose infections will resolve without treatment.
3. In any event, 48 hours of treatment will be needed before the symptoms abate even if there is an infection.

The conclusion is that temporarily withholding antibiotic treatment is by no means the drastic step that it might seem.

SUBSEQUENT MANAGEMENT

It is obvious that if there is a urinary infection the antibiotic should be active against the pathogen and excreted in the urine. Short courses of treatment have been recommended e.g. amoxycillin for one and three days have both been found to be effective.¹¹ However, trimethoprim BP 100 mg twice daily for seven days would cost less than amoxycillin and the results would be at least as satisfactory.

Follow-up of patients with proven infections should always be carried out, ideally seven days after treatment has ended. Dip-slides are, in our experience, a poor substitute for a well-collected MSU as they are frequently badly inoculated. It should be impressed upon the patient that disappearance of symptoms should not be assumed to mean that the infection has cleared and that treatment can therefore be stopped. Conversion of symptomatic to asymptomatic infection is a possibility that must be excluded by follow-up. When urine is sterile at the seven-day follow-up no further tests are needed (Figure 1). However, 5 to 10% of infected patients will still be bacteriuric after treatment. Reasons for

this include poor compliance by the patient. If this is suspected the gp should question the patient and where there is genuine doubt treatment needs to be repeated after counselling the patient. Compliant patients, where treatment fails or infection occurs repeatedly, come into a class of "problem patients", and should be referred to a specialist clinic for further investigation¹² (Figure 1). Management of patients who complain of symptoms but in whom urinary infection and vaginitis have been ruled out present a problem discussion of which is beyond the scope of this article. Patients with recurrent urinary infection may need hospital investigation but can also benefit from simple advice :

1. They should wear cotton underwear, stockings or single-legged tights so as to allow circulation of air round the perineum which avoids creating a warm damp environment where bacteria flourish.
2. If the patient uses a diaphragm it should be checked to make sure it fits properly. An ill-fitting diaphragm is a common cause of dysuria. A different spermicide may also be required.
3. Tampons are preferable to pads as the latter can help spread infection to the urethra.
4. If urinary infection is linked to vaginal dryness (e.g. due to the menopause) use of KY lubricant jelly and oestrogen creams to remedy hormonal deficiency may be helpful.
5. Recommended use of plain toilet paper, since the dyes in some coloured paper may irritate.
6. Avoid scented soap, bubble baths, douches, antiseptics, talcum powder, vaginal deodorants and deodorised tampons.
7. Completely empty the bladder before going to bed.

By these simple procedures the patient may find that the infections disappear and lengthy hospital investigation and expensive treatment can be avoided.

CONCLUSION

The gp can help himself, his patient and the community at large by taking a careful look at the way he deals with patients complaining of frequency and dysuria. Merely handing out prescriptions for antibiotics is both expensive and may be damaging. While several categories of patient should be referred for specialist care (Figure 1) by far the commonest group can be managed quite adequately by the gp.

Aetiological diagnosis necessitates properly collected specimens of urine to be sent to the microbiology laboratory. In turn, the laboratory must give a rapid report of culture and sensitivity. Pending the results of the laboratory report proper use of the microscope and reagent strip test in the surgery should enable a tentative diagnosis to be made rapidly. Under these circumstances treatment need only be given to a fraction of the patients. Providing the microbiology report is returned rapidly most of the patients can await the results of the investigations and unnecessary antibiotic treatment avoided.

Thus it is obvious that treatment prior to proper diagnosis should be given only when absolutely necessary. Where "true" infection is found follow-up to confirm cure is mandatory. By defining those patients who repeatedly fail treatment it is possible to select those who require further investigation.

REFERENCES

1. Brooks D. A general practitioner's view of the laboratory examination of urine. In : Meers PD, ed. The bacteriological examination of urine : report of a workshop on needs and methods. London : HMSO, 1978;39-40. (Public Health Laboratory Service monograph series No. 10).
2. Walker M, Heady JA, Shaper AG. The prevalence of dysuria in women in London. *J R Coll Gen Pract* 1983;33:411-415.
3. Waters WE. Prevalence of symptoms of urinary tract infection in women. *Br J Prev Soc Med* 1969;23:263-266.
4. Stamm WE, Wagner KF, Amsel R, et al. Causes of the acute urethral syndrome in women. *N Engl J Med* 1980;303:409-415.
5. Brumfitt W, Faiers MC, Reeves DS, Datta N. Antibiotic-resistant *Escherichia coli* causing urinary-tract infection in general practice : relation to faecal flora. *Lancet* 1971;1:315-317.
6. Mond NC, Percival A, Williams JD, Brumfitt W. Presentation, diagnosis and treatment of urinary-tract infections in general practice. *Lancet* 1965;1:514-516.

7. Bradley MG, Hobson D, Lee N, Tait IA, Rees E. Chlamydial infections of the urethra in women. *Genitourin Med* 1985;61:371-375.
8. Komaroff AL, Pass TM, McCue JD, Cohen AS, Hendricks TM, Friedland G. Management strategies for urinary and vaginal infections. *Arch Intern Med* 1978;138:1069-1073.
9. Bell S. The relevance of bacteriology tests to the clinical use of antibiotics in domiciliary practice. *J Ant Chem* 1976;2:110-112.
10. Garrod LP, Shooter RA, Curwen MP. The results of chemotherapy in urinary infections. *Br Med J* 1954;2:1003-1008.
11. Charlton CAC. Ultra-short treatment of urinary tract infection. In : Asscher AW, ed. *The management of urinary tract infection : international symposium proceedings*. Oxford : Medicine Publishing Foundation, 1980;81-84.
12. Brumfitt W, Hamilton-Miller JMT, Ludlam H, Bax R, Smith GW. Organization and function of a urinary infection clinic : parts 1 & 2. *Br J Hosp Med* 1983;30:308-12,381-387.