Yeasts in the urine

Five per cent or so of the urine specimens received for culture in a general hospital laboratory may yield heavy growths of yeasts, of several different species. The commonest is Candida albicans, followed by Torulopsis glabrata and then Candida tropicalis (Ahearn, Jannach & Roth, 1966; Speller & Davies, 1973). The significance of this finding is often doubtful. In a very few cases yeasts may appear in the urine as a consequence of fungaemia, when blood borne yeasts enter and multiply in the renal tubules. Renal infection may be reproduced similarly in mice injected intravenously with C. albiens; the mice may later die of obstructive uropathy from growth of the mycelium in the renal pelvis. Fungaemia, however, accounts for very few patients with yeasts in the urine, and the great majority have had colonization of the bladder by the ascending route by yeasts originating in the gut. A few patients will be diabetics with no other known abnormality, but most patients will have abnormal or damaged urinary tracts, and may well have been treated by indwelling or intermittent urethral catheterization, and with antibacterial drugs.

The natural history of these infections is extremely varied, transient or prolonged in duration, benign or serious in prognosis (Schönebeck, 1972). Yeasts may appear in a patient's urine, grow up to large numbers and disappear in a few days. Other patients may continue to harbour yeasts in the urine for months or years with apparently no deleterious effect. Usually the colonization is restricted to the lower urinary tract but occasionally the renal pelvis and even the kidney parenchyma may be invaded. Occasionally the urinary tract may be the source of a disseminated systemic yeast infection in a debilitated patient.

The first step in the assessment of yeasts grown from urine specimens is to decide whether there is "significant funguria," whether the yeasts are genuinely in the bladder urine or merely contaminants. With catheter specimens there should be no difficulty, but sometimes when a catheter has been in situ for a long period misleading results may be obtained by the colonization of the catheter itself with yeasts (R. R. Davies, personal communication). If there is no catheter in situ the patient should be examined to see that there is no overt vaginal or perineal infection with yeasts, and a cleanly collected mid-stream specimen should be obtained. A semi-quantitative colony count can be carried out on a mycological medium such as Sabouraud's dextrose-peptone agar and assessed by the criteria used for bacterial growth on other media. Yeasts which are genuinely present in the bladder urine are rarely seen in counts below $10^4$ colonies per ml and are usually more numerous than $10^6$ per ml (Ahearn et al., 1966).

A sensible first approach to patients who have had significant funguria is to remove as many of the predisposing conditions as possible and to repeat the test after an interval of a few days. The colonization may be transient in any case, and removal of a catheter, stabilization of diabetes, or stopping of antibacterial agents may accelerate the disappearance of the yeast. In many cases, however, funguria will persist and it is necessary to select from this large number the few patients who require specific antifungal treatment. It must be admitted that the criteria for this selection are not clear cut. The presence of excessive numbers of leucocytes in the urine, and above all the persistence of symptoms referable to the urinary tract, when no bacterial pathogen is to be found, are the most compelling factors. C. albicans is the most likely yeast to be pathogenic, while Torulopsis glabrata is rarely of importance except in diabetics (Speller, 1974) or in patients with severe underlying disease or damage to the urinary tract. C. tropicalis may also be responsible for significant infection (Ahearn...
et al., 1966). Although patients with urinary tract infection caused by yeasts may have serum antibodies to the fungus, demonstrable by both agglutination and precipitation techniques, in the present state of our knowledge antibody titration does not usually help in deciding whether or not to treat the patient. Besides those patients who have evidence of active infection by the yeast as described here, it may be necessary to treat other patients whose underlying condition makes them peculiarly liable to systemic invasion and those with particularly vulnerable urinary tracts, especially patients with renal transplants.

Treatment can be simple and safe and therefore does not have to be reserved for those cases with incontrovertible evidence of active or invasive infection, but can be given on reasonable suspicion of these. Before the introduction of fluconazole the use of urinary antiseptics and changing of the pH of the urine were not often successful in clearing established infection and the only valuable treatment was irrigation of the bladder with amphotericin-B or nystatin, parenteral amphotericin-B being reserved for cases with evidence of serious tissue infection or dissemination. Amphotericin-B irrigations are certainly often successful in eradicating yeasts from the bladder but there are many merits in the use of fluconazole. Moderate oral dosage of fluconazole produces satisfactory serum concentrations and very high urinary concentrations throughout the urinary tract and throughout the 24 h. Dosage must be modified in renal impairment (Schönebeck, Polak, Fernex & Scholer, 1973). The very great concentration in the urine probably explains the greater success of fluconazole in urinary infections than in other sites. The isolate should be tested for sensitivity to fluconazole at the beginning of treatment; a disc test is quite satisfactory providing non-antagonistic media are used and a control sensitive strain is included (Marks & Eickhoff, 1971). Published results vary but probably about 5% of isolates from clinical specimens may be found resistant to fluconazole (Speller & Davies, 1973). Failures with fluconazole have been reported and resistant yeasts may emerge during the treatment, but in general the results are very satisfactory.

Eradication of yeasts in the urinary tract is thus usually readily accomplished, and recurrence is not common. The success of the treatment, however, is often eclipsed as the patient develops a series of further bacterial infections.

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References

A view of bacteroides
It is fashionable these days to interest oneself in anaerobic bacteriology; and if your anaerobic technique is adequate, you will be isolating anaerobes (especially the non-sporing varieties) from specimens which, until you climbed on to the anaerobic bandwagon, had yielded only pedestrian organisms such as Escherichia coli and faecal streptococci. This is splendid! But don't, in your enthusiasm, be misled into believing that all anaerobic isolates are clinically significant, or that all anaerobic infections require specific antimicrobial therapy.

You will remember that non-clostridial anaerobes are obligate parasites that form a large part of the normal bacterial flora of the mucosal surfaces of the oropharynx, and of the alimentary and female genital tracts. Under appropriate conditions these indigenous bacteria may cause endogenous infections by invading the tissues adjacent to their normal habitats. Thus, infection of the female genital tract is greatly favoured by blood loss and tissue damage, and may occur in spontaneous abortion, prolonged labour and postpartum haemorrhage. Similarly, the trauma of abdominal surgery, especially bowel and gynaecological surgery, provides conditions favourable