CANDIDIAL INFECTION OF THE URINARY BLADDER

(A Case Report)

by

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Though fungal infections in general are becoming more common now, still urinary tract involvement is not very common. Scattered reports of candidiasis of urinary tract are available. In disseminated candidiasis renal involvement is almost always found but primary renal involvement is much rarer than primary candidial cystitis. According to Forest, August and Perry (1968) over 100 patients with disseminated candidiasis have been reported and about 70 per cent had renal damage secondary to candidial proliferation. Including their 2 cases, some 11 well documented cases of primary renal candidiasis have been described, whereas over 30 cases of primary candidial cystitis have been reported.

This case has drawn attention due to its rare occurrence. A case of cystitis due to Candida albicans has been reported, along with the laboratory methods of diagnosis and discussion.

CASE REPORT

Mrs. S., a 30-year-old woman was referred to the department of Microbiology on 23rd September, 1974 for getting the urine culture done. She complained of cessation of menstruation for 6 months, backache and weakness for one month, pain burning sensation during micturition for 25 days and fever ranging from 99°F with chills for 15 days. Her menstrual cycles were regular, she had her last menstruation in the second week of March, 1974. She was a fourth gravida. The first pregnancy ended in a stillbirth, the second in a caesarean section for foetal distress and the third was a normal delivery in the hospital. Before referral she was treated for cystitis with 30 tablets of Nitrofurantoin (100 milligram tablets) which aggravated the dysuria. The physical examination was negative except for pallor, and pregnancy of 24 weeks' duration.

Laboratory Tests

The total R.B.C. was 3.5 million per cu.mm., total W.B.C. was 9,650 per cu.mm., with 68% polymorphs, 26% lymphocytes, 5% eosinophils and 1% basophil. Haemoglobin was 9.4 grams. Blood group was B, Rh positive and the serology was negative. The fasting blood sugar was 90 mg per cent and postprandial blood sugar was 116 mg per cent. Routine examination of urine was negative except for presence of pus cells 60-80 per high power field and yeast like cells 30-35 per high power field in the centrifuged sample of urine.

Midstream urine was inoculated on 2 plates of MacConkey's agar, one for qualitative and the other for quantitative examination using the pour plate technique (Cruickshank, 1965). After 48 hours of incubation at 37°C it revealed a mixed growth of streptococcus faecalis and yeast like cells, the latter being predominant. The total count was more than 10^5 organisms per millilitre of urine. The first impression was that the yeast like cells were vaginal contaminant. The patient was called again on 27th of September, 1974 for collecting fresh sample of urine and for searching the yeast like cells at other sites. Vaginal and oral swabs were collected. Stool, vaginal and oral secretions were inoculated on two plates of Sabouraud's agar for incubation at 37°C and at room temperature. With all aseptic measures the bladder was

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catheterized on three alternate days for culture on Sabouraud’s agar and MacConkey’s media. The plates were inspected every alternate day for growth. The samples from the stool and oral cavity did not show growth. The vaginal and all three catheterized samples of urine developed cream coloured colonies on Sabouraud’s media on third, or fourth day of incubation. The total count was more than $10^6$ organisms per millilitre in all three catheterized samples of urine. The wet film revealed the typical yeast like cells having the size of 2-4 microns (Fig. 1). The yeast like cells were strongly Gram positive. The possibility of Cryptococcus neoformans was ruled out by employing the India ink staining method (Bailey and Scott, 1966).

On further incubation it developed plenty of budding cells along with pseudomycelia with clusters of blastospores at the constrictions. The organism was thus identified as belonging to Candida species.

Since Candida albicans is the only important pathogen in the Candida species a battery of tests was employed to identify the variety of Candida isolated.

(i) Sugar fermentation test: Glucose and maltose were fermented with production of acid and gas, sucrose was fermented with production of acid only and lactose was not fermented.

(ii) Pathogenicity: was tested by injecting 1 ml. of one per cent suspension of the 24 hour culture in the ear vein of the rabbit. The animal died on the fifth day of injection. On postmortem examination the renal cortex was seen to be studded with multiple abscesses.

(iii) Chlamydospore formation: The colonies were subcultured on corn-meal agar (Benham, 1931) by putting deep streaks in the media and incubated at 20°C, after 72 hours of incubation it developed branching tree like pseudomycelia with large spherical, thick walled chlamydospores at the tips of most of the branches (Fig. 2).

The laboratory tests confirmed the yeast like organisms to be Candida albicans. The yeast like organism isolated from the vaginal secretion also proved to be Candida albicans after employing the confirmatory tests.

The blood culture was negative and intravenous pyelography was not suggestive of renal involvement.

On cystoscopy, marked hyperaemia with a small thrush like membrane, approximately 2 cm x 1.5 cms. was seen on the posterior surface.

The bladder was irrigated with 1 in 10,000 solution of Gentian Violet on every alternate day for 3 treatments with alkalinization of the system. This brought about symptomatic relief but no significant reduction in the Candida count. A course of Mycostatin was given. The urine was checked again after 2 weeks and was found to have few Candida organisms (10 per milliliters of urine).

**Discussion**

Out of nearly 50,000 valid species of fungi only about 50 generally recognized as being pathogenic to man (Bailey and Scott, 1966). Some fungi are saprophytes and some are pathogenic. Still there are some which live as commensals in the host but in case of altered body resistance multiply in number and become pathogenic, such fungi are called opportunistic invaders. Candida organisms are now called as opportunistic invaders since they are the common saprophytes of gastro-intestinal tract, oral cavity and vagina but under favourable conditions they become pathogenic. The cause for the increased incidence of fungal infections in recent years is attributed to prolonged use of antibiotics, corticosteroids, immunosuppressive drugs, intravenous catheters, uncontrolled diabetes, chronic diseases lowering the body resistance and surgical procedures on genito-urinary tract (Forest, August and Perry, 1968).

Fungus infection of the urinary bladder is more common in females. Guze and Haley (1958) examined 1500 unselected urine samples for fungi. Fungi in significant numbers were found in 75 samples (count more than 1000/ml. according to their own figure of significance). Out of 15, 12 samples were from female patients and 9 of the 12 were from diabetic females. Significant count of more 100,000/ml. than of urine (Kass, 1957).
is true for bacteria and not for fungi, hence many workers like Guze and Haley (1958) consider a count significant if it exceeds 1000 per millilitre only.

The presence of Candida in the urine presents a diagnostic dilemma as to whether it is contaminant, saprophyte or pathogen. Thus for the diagnosis of urinary candidiasis the organisms must be recovered constantly and repeatedly from the catheter specimen of urine in significant numbers. Candida species appear in routine mid-stream urine culture in 1.5 to 3 per cent of patients. (Gilbert, Biswamay and Philip, 1972) Haley (1965) has shown that vast majority of candida isolated from routine culture come from the lower urethra and colony counts of candida in contrast to bacteria have little or no significance. It is now certain that candida organisms must be isolated from catheterized sample of urine before they are labelled as pathogens. If signs, symptoms, laboratory and radiological evidence of upper urinary tract disease are present with presence of candida in the catheterized sample of urine, renal candidiasis must be considered. If candida is isolated from the catheterized samples of urine in a patient with no evidence of upper urinary tract disease, candidial cystitis is to be considered and ideally should be confirmed by cystoscopy.

Candida albicans is the only important pathogen amongst the other varieties like C. tropicalis, C. pseudotropicalis, C. Krusei, C. parakrusei, C. stellatoidea and C. guillermondii. Hence it becomes essential to identify the type of candida isolated.

In the present case Candida albicans was identified by sugar fermentation test, testing the pathogenicity in rabbit and by developing terminal chlamydospores by growing the culture on corn meal agar. Chlamydospore formation is the surest test for identifying Candida albicans since no other species can form chlamydospores in abundance. Renal involvement was ruled out by the negative radiology and the possibility of dissemination was ruled out by the negative blood culture and absence of candida at other sites except vagina.

Recovery of candida albicans on repeated catheterization of bladder, presence of thrush-like membrane on cystoscopy, absence of dissemination and absence of renal involvement, pin point the diagnosis as candidial cystitis. Since Candida albicans was also isolated from the vagina, it could be the source of infection. The possibility of candidial infection of the urinary tract should be borne in mind if candidial vaginitis is left untreated for long time. Chisholm and Hutch (1961) reported 2 cases of strange fungus balls (C. albicans) in the urinary bladder. They also presume that the bladder infection originated from monilial vaginitis.

In the present report the patient had taken Nitrofurantoin (300 milligram) before the urine was cultured, this itself acts as a predisposing factor as has been observed by Forest et al (1968) in their 2 patients. Thrush-like membrane formation in the bladder has been reported by Moulder (1946) and Sauer (1948). Gentian violet irrigation of the bladder has been used by Sauer (1948) and Albers (1953) before the newer antifungal agents like Nystatin, Amphotericin, etc. were available. The possibility of retrograde infection is being tested in rabbits in our laboratory.

Summary

A case of cystitis due to Candida albicans has been reported. Laboratory find-
ings and diagnosis have been discussed. It is postulated that candidial vaginitis if not treated for long time may lead to urinary tract involvement.

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References