Value of Dipslides in the Diagnosis of Significant Bacteriuria in Pakistan

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Abstract

The accuracy of the dipslide method for diagnosing significant bacteriuria was assessed. Dipslide culture method was compared with conventional pourplate method. One hundred Urine samples were collected from 2 groups of patients. The first group comprised of patients with symptoms of urinary tract infection. In the second group catheterized patients were included. Dipslide method showed 5.6% false positive and 5.6% false negative results. E. coli was the commonest organism isolated. It is recommended that this method should be routinely used in hospital and general practice (JPMA 34 : 310, 1984).

Introduction

Urinary tract infection (UTI) is common the world over, particularly in children and old age. Diagnosis of UTI has been a problem in the past. Diagnosis of asymptomatic bacteriuria and poor correlation of UTI with pyuria and urinary symptoms has established the value of urine culture in the management of UTI[1].

The difficulty of urine collection for culture with high degree of contamination has lead to the development of quantitative bacterial examination of midstream urine specimens[2]. However, the standard pour plaLe method is time consuming and difficult to perform on a mass scale. In recent years simpler methods for the detection of significant bacteriuria have been established. The dipslide culture method is an established simple, cheap and reliable procedure which can be performed without sophisticated laboratory backup[3,4].

It was felt that dipslide culture method could be of value in the management of UTI in Pakistan where laboratory facilities are inadequate especially in small towns and rural dispensaries.

The present paper assesses the accuracy of dipslide culture method with the conventional pourplate method. The acceptibility of the procedure by the medical practitioner and the patients was also subjectively assessed.

Material and Methods

One hundred urine samples were collected from 2 groups of patients. One group comprised of 47 patients with symptoms of UTI and the second group comprised of 53 catheterized patients.

In all patients morning specimens were taken. Mid-stream voided urine samples were taken from the first group. In second group catheter was clamped for half an hour and urine was collected with a disposable syring (10 cc) after clearing the catheter with sterile water. Half of the urine sample was put in sterile test tube and transported within one hour to the Department of Pathology, Allama Iqbal Medical College, Lahore. The rest of the specimen was used for dipslide culthre in the ward laboratory. Dipslide used (Uricult) has 2 media mounted on it. One side has MacConkey and other side has CLED media. After dipping the slide in urine specimen, it was incubated at 37°C for 24 hours in the ward laboratory. After 24 hours the number of bacteria were estimated by comparing the slide with the chart

provided with the dipslide. If more than one type of colony were noted, the specimen was reported as contaminated. Colony count of 10^5 /ml or more was regarded as significant bacteriuria, count of 10^3/ml or less was considered as insignificant and count of 10^4/ml was regarded as border line.
Pour plate method[5] was used for colony count in Allama Iqbal Medical College, Lahore. Bacteria were isolated and sensitivity pattern determined.
Due to various technical reasons only 80 samples could be cultured by both methods. In rest of 20 samples either one of these methods was used.

Results

There were 70 males and 30 females. Age of patients varied from 4-80 years (Mean age 33.4). Out of 53 catheterized patients, 27 patients showed significant bacteriuria by pourplate method, and 29 by dipslide method. In 47 patients suspected of having UTI, 11 patients by dipslide method and 13 by pourplate method showed significant bacteriuria.
Dipslide Method (Table I)

Table I

Dipslide Culture Bacterial Count.

Significant	Insignificant	Borderline	Contaminated	Nil	Total.
39	13	9	1	25	87

Thirty nine patients out of 87 patients showed significant bacteriuria. 13 had count of 10^3/ml or less, 25 had no growth, 9 patients had count of 10^4/ml. Compared to pour plate method this method showed 5.6% false positive and 5.6% false negative results.
Pour Plate Method (Table II & III)

Table II

Pour Plate Culture Bacterial Count.

Significant	Insignificant	Borderline	Contaminated	Nil	Total
40	9	3	11	30	93

Table III
Types of Bacteria Isolated.

E. Coli.	..	30
Pseudomonas	..	5
Staph. Aureus	..	5
Proteus	..	4
Enterococcus	..	3
Klebsiella	..	1
Streptococcus	..	1
Staph. Albus	..	1
Total:–	..	50

Out of 93 samples 40 had significant bacteriuria, 9 had insignificant bacteriuria and 3 were border line. 30 patients did not show any growth. 11 samples were contaminated perhaps due to poor transport technique. Out of 50 culture positive cases bacteria isolated were' 30 (60%) E. coli, 5 (10%) Pseudomonas and 5 (10%) Staphylococcus. Proteus were isolated in only 4 patients (8%) (Table- III). Sensitivity pattern is shown in Table IV.

Table – IV
Culture Sensitivity Pattern For E. Coli in 30 Urine Samples.

S.No.	Drugs	Sensitive %	Resistant %
1.	Tobramycin	95.84	4.16
2.	Nitrofurantoin	95.1	4.9
3.	Cephalexin	90.9	9.1
4.	Gentamicin	82.0	18.0
5.	Carbenicillin	28.0	72.0
6.	Lincomycin	20.0	80.0
7.	Co-Trimoxazole	15.0	85.0

Discussion

Infections of urinary tract produce considerable morbidity and mortality. It is more common in females. 5% of school girls on an average, experience one eiiisode of UTI during school life[6]. In the elderly females frequency of infection may be as high as 10%[7]. Proper diagnosis and treatment of UTI will not only reduce morbidity but perhaps also save number of patients from end stage renal failure.

It has been shown by the work of Kass and others[1] that clinical analysis and microscopic examination of urine for the diagnosis of UTI are inadequate and can be misleading. Culture of the urine can also be inaccurate because it cannot differentiate between true bacteriuria and contamination in mid-stream urine specimen. Colony count is essential for diagnosis of UTI in voided urine specimen[8].

Although there is remarkable agreement Hmong the physicians treating UTI Regarding colony count as the only correct method for the diagnosis of UTI, yet it is rarely applied in Sour country. In most cases diagnosis of UTI is based upon symptoms, urinary microscopy and urine culture if done by semiquantitative method. It is thus not surprising that cases of true bacteriuria are missed, or antibiotics are administered inadvertently.

The present practice of diagnosis and treatment persists for number of reasons. Cost bf investigations and lack of microbiology laboratory facilities are two important factors. Patients are also usually not willing to undertake laboratory tests. To improve the standard of diagnosis, there is a need for a method which is simple, inexpensive and requires minimal laboratory facilities.

In recent years some simple and low cost methods of detecting bacteriuria have evolved. We have selected dipslide method to assess its accuracy as compared to the conventional pour plate method under our circumstances. McAllister (l973)[3] has reported high degree of correlation or results when

compared with pour plate method in a study on 2, 596 urine samples. In our study also a close correlation between the results obtained by the two methods has been shown. In 61 samples where dipslide method was compared with pour plate method identical results were obtained. Only in 4 patients (56%) false positive results were noted and in 4 patients (5.6%) false negative results were noted.

Dipslides have also shown additional advantages. The technique is simple and can be taught to nurses and patients. Like all developing countries cost of investigations is one of the most important factor in the management of patients. The situation is made worse in general practice where patients also demand immediate relief of their symptoms. This method is convenient for high degree of accuracy. The results can be obtained after 24 hours instead of 48 hours. Problem of collecting and transporting of urine sample is also solved.

We thus conclude that this method is reliable, accurate and is best suited for our country. The cost of investigation is far less than conventional method. It is recommended that it should be used routinely in hospitals and general practice.

Acknowledgement

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