RAPID AUTOMATED DIAGNOSIS OF URINARY TRACT INFECTION REGULATES THE USE OF ANTIBIOTICS IN OBSTETRICS& GYNECOLOGY DEPARTMENT

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ABSTRACT

Urinary tract infections are the most frequent bacterial infection in the community and hospital populations. In light of the continuing increase in antibiotic resistance, a rapid report of urine culture result is essential for choosing the treatment strategy and avoiding unnecessary treatment.

Alfred60 automated system, which is used in our lab since the 2nd quarter of 2013 can provide urine culture results within 4 hours, thus reduce unnecessary antibiotic treatment.

OBJECTIVE

To test whether rapid detection and reporting of urine culture results using the Alfred60 automated system can regulate the empirical treatment for suspected UTI in the Obstetrics & Gynecology department.

MATERIALS AND METHODS

1. Samples: Urine in sterile tubes
2. Culture media:
   a. Tryptic Soy Blood agar and Chromagar Orientation (Hy Labs, Israel)
   b. Uro-quick vials (Alifax, Italy)
3. Alfred 60 automated system (Alifax, Italy)

CONVENTIONAL PROCEDURE

One µl of urine sample was streaked on Tryptic Soy Blood agar and Chromagar Orientation media (Hy-Labs, Israel). Amount of Colony-Forming Units (CFU/ml) was determined after incubation at 35°C for 24 h. CFU of ≥5 × 10^4/ml was considered positive.

THE ALFRED60 AUTOMATED SYSTEM

The urine samples were inserted into Alfred60 automated system, 0.5 mL of urine was inoculated automatically into UroQuick broth vials (See Figure 1) and incubated for 3.5 h, which correlates to 4 × 10^3 CFU/ml cut-off according to manufacturer’s guidelines.

RESULTS

A total of 1356 urine samples were sent from the Obstetrics & Gynecology department in 2013 of which 67% (912 samples) were tested by the Alfred60 automated system and in case of no growth, reported on the same day. Positive samples were tested by the traditional method and reported following 24–48 hours.

In Figure 2 the ratio between Alfred60 method and traditional method is shown. It can be seen that starting from the 2nd quarter (q2) till 4th quarter (q4) of 2013, there has been a 53% increase in the Alfred60 platform usage for detection of UTI as compared with the traditional method.

Figure 2: The ratio between Alfred60 and traditional method for detection of UTI.

As expected, 67% (561 samples) showed no growth and reported as negative to Obstetrics & Gynecology department on the same day. Positive urine cultures were further analyzed and the bacteria isolated is summarized in Figure 3.

Figure 3: Summary of isolated bacteria from positive urine cultures
a. Gram negative bacteria
b. Gram–positive bacteria and candida

CONCLUSIONS

1. Alfred60 automated system allows the lab to shorten the turn–around time between urine sampling for culture and reporting of preliminary results.
2. This unique technology will allow clinicians to use the prompt data to choose the best strategy of treatment or avoid antimicrobial treatment in non–UTI cases.
3. Quick result reporting of non–UTI samples may reduce the need for antimicrobial treatment, thus restrain the increase of antimicrobial–resistant bacteria.