SUMMARY

Nosocomial infections represent a major hazard in health care facilities, their effects are on the infected patients, their families and the health care system.

Increasingly, microbes are becoming resistant to a substantial proportion of drugs which considered the first line treatment, this often necessitate the use of more costly antimicrobial agents. Such resistance is having an impact not only on the therapy of the individual patients but also on the infection control in the hospital.

Automation was introduced into the clinical microbiology laboratory in the late 1960s. Since that time improvement in technology and the introduction of computerized data analysis have made mechanization practical and allowed its applications to expand. Today instruments have many uses in the microbiology laboratory as isolation and detection of organisms in clinical specimens, identification of isolates and testing the susceptiblity of isolates to antimicrobial agents.

The purpose of the present study was to identify current nosocomial pathogens. It also aimed to compare species identification obtained by Microscan Walkaway 40 and Sensititre autoreader system with those obtained by conventional methods (routine tube biochemical tests and BBL crystal enteric non fermenter ID kit in case of gram negative bacilli and catalase, coagulase, DNase, bacitracin, bile solubility and streptex in case of gram positive cocci) to devise a method for the identification which is technically simple, accurate and rapid.

This study was conducted on 200 specimens from patients with nosocomial infections from May 2000 to April 2001 .

The specimens included : 79 urine sample, 62 pus sample, 33 blood sample and 26 sputum sample.

All specimens were subjected to the followings :
- Direct stained smear.(except blood samples).
- Isolation of the organism by culture on ordinary media.
- Viable bacterial count. (for urine samples).
- Gram stained smear for the islated organism.

For gram negative bacilli, the identification was done by

A-Conventional method :

1- Traditional tube biochemical reactions.
2- BBL crystal TM identification system (Enteric/ Non fermenter) *(Becton Dickinson)*

B-Automated methods :

- Dade Behring Microscan Walkaway 40.
- Accu – Med – Inc, Sensitire.

For gram positive cocci, the identification was done by :

A-Conventional methods [Catalse, coagulase, DNase, bacitracin, bile solubility and streptex (Murex biotech limited)].

B-Automated systems (Microscan Walkway 40 and Sensititre).

For testing susceptibility :
- Conventional disc diffusion (for both gram negative bacilli and gram positive cocci).

- Automated system (Microscan Walkaway 40 and Sensititre systems) for both gram negative bacilli and gram positive cocci.

• Gram negative bacilli were isolated from 78% of specimens collected from patients with nosocomial infections, while gram positive cocci were isolated from 22% of these specimens.

• Proteus group was the most common gram negative pathogen isolated in the study, while Staph.aureus was the commonest gram positive pathogen.

• E.coli and Proteus groups were equall causes for nosocomial urinary tract infection (32.4% - 24 out of 79 for each).

• Pseudomonas group was the commonest pathogen causing nosocomial wound infection in our study (33.3% - 19 out of 62).

• However, in blood stream and respiratory tract infections, Klebsiella group was the most frequent (21.2% - 7 out of 33 and 30.8% 8 out of 26 respectively).

• The predominant types of nosocomial infections caused by gram positive cocci were the urinary tract and wound infections (16 cases for each – 36.4%).

• Blood stream and respiratory tract infections come in the subsequent order of frequency.

• Coagulase negative staph was the most common gram positive pathogen causing urinary tract infection (13.9% - 11 out of 79), while Staph.aureus was the most common one in wound infection (16.1% - 10 out 62))

• The agreement between the Sensititre Ap 80 plate identification and that of conventional system identification for members of the family

enterobacteriacae was 97.4% at the genus level and 93.4% at the species level.

- However the agreement between the two methods for non enterobacteriacae group was 91.7% at both the genus and species level.

- The agreement between the results of Microscan conventional negative panel and that of conventional system identification for members of enterobacteriacae was 97.4% at the genus level and 96% at the species level.

- However the agreement between the two methods for non enterobacteriacae group was 95.8% at the genus level and 91.7% at the species level.

- Imipenem was the most effective antibiotic against members of the family enterobacteriacae isolated in the study (81.6% susceptible by DD).

- Amikacin and imipenem were the most effective antibiotics against members of non enteriobacteriacae group isolated in the study (62.5% susceptible for each).

- The highest precent of resistance for the enterobacteriacae group occurred with ampicillin (92.1%), followed by nitrofurantoin (90%), while for non enterbacteriacae group occurred also with ampicillin (95.8%) followed by cefazoline and trimethoprim / sulfamethoxyzole (91.7% for each).

- The agreement between the results of Microscan gram negative breakpoint combo panel and that of disc diffusion was 98.6% for

members of enterobacteriacae and 97.2% for members of non enterobacteriacae group.

- The agreement between the results of Sensititre breakpoint autoreader system and that of disc diffusion method was 98.2% for enterobacteriacae and 96.7% for members of non enterobacteriacae.

- Vancomycin was the most effective antibiotic against gram positive isolates (97.5% susceptible) followed by imipenem (82.5% susceptible.

- The agreement between the results of Microscan gram positive breakpoint combo panel and that of disc diffusion method was 98.7% and the agreement between the results of Sensititre system and that of disc diffusion method for antibiotic susceptibility of gram positive isolates was 98.5%.