

Nosocomial infections in burn units from Al-Hada armed forces and King Faisal Hospital, Saudi Arabia

A.R.H. BINSADIQ

College of Science, King Saud University P.O. Box - 2455, Riyadh - 114 51 (Saudi Arabia).

(Received: October 25, 2007; Accepted: November 21, 2007)

ABSTRACT

The present study aimed to build a baseline profile for microbial contamination in the hospitals. Contaminated was detected on all studied samples. There are huge lack of knowledge regarding microbial hospitals contamination in the hospitals. The present investigation recommend an evaluation of microbial infections in addition to conduction a nationwide health education campaign on microbial control and infections of hospitals.

Key words: Nosocomial, infection, hospital, microorganisms, contamination.

INTRODUCTION

The diagnosis and management of hospital infections requires an understanding of the presenting clinical manifestations and knowledge of microbiology.

The hospital constitute a special environment with relationship to microbial infection. Many patients admitted to hospitals have an illness or other medical problem that may impair one or more of their basic defense mechanisms. Any object that comes in contact with an infected patient or that patients surrounding may become contaminated with pathogenic-microbes. Medical paraphernalia, such as stethoscope, thermometers as well as equipment used for administering anesthesia or inhalation therapy, have been incriminated of transmitters of some nosocomial infections. Many modern medical procedures increase the chance that infections will occur. Much has been done in the past few years to prevent microbial hospitals infctions, each hospital must have an effective infection control program (Jensen and Wright, 1989; Brooks *et al.*, 1995).

MATERIAL AND METHODS

A total of 150 samples were collected from burn units from Al-Hada Armed Forces (100) and King Faisal Hospital (50), using sterile cotton swab moistened with sterile distilled water, swabs were immediately inoculated to 5% sheep blood agar and sabouraud dextrose agar, the plates were incubated at 37 °C for five days. Morphological studies were recorded and biochemical testes also carried out according to clinical microbiology method (Patrick *et al.*, 2003).

RESULTS AND DISCUSSION

Microbial contamination was detected on all studies samples, there is a difference in incidence of the bacteria and the fungi that isolated from both hospital (Table 1 and 2). A total of 150 environmental samples were collected from different sites from burn units from the two hospital (Ground floor, wall, labcoat, telephone, and patient hands).

There are little attention have been given to the microbial contamination of hospitals in Saudi

Table 1: Bacteria and fungi isolated from Al-Hada Armed Forces Hospital.

Bacteria	Fungi
<i>Achromobacter</i> sp.	<i>Alternaria</i> sp.
<i>Acinetobacter</i> sp.	<i>Aspergillus niger</i>
<i>Bacillus</i> sp.	<i>Aspergillus sydowii</i>
<i>Burkholderia cepicia</i>	<i>Bacidiobolus</i> sp.
<i>Chrysomonas luteola</i>	<i>Cryptococcus</i> sp.
<i>Escherichia coli</i>	<i>Cunningamella</i> sp.
<i>Flavobacterium odoratum</i>	<i>Candida tropicalis</i>
<i>Gamella morbillorum</i>	
<i>Kelbsiella oxytoca</i>	
<i>Photobacterium damsela</i>	
<i>Proteus</i> sp.	
<i>Pseudomonas</i> sp.	
<i>Micrococcus luteus</i>	
<i>Micrococcus roseus</i>	
<i>Moraxella</i> sp.	
<i>Staphylococcus simulans</i>	
<i>Staphylococcus aureus</i>	
<i>Staphylococcus capitis</i>	
<i>Staphylococcus caprae</i>	
<i>Staphylococcus hominis</i>	
<i>Staphylococcus sciuri</i>	
<i>Streptococcus acidominimus</i>	

Table 2: Bacteria and fungi isolated from King Faisal Hospital.

Bacteria	Fungi
<i>Achromobacter</i> sp.	<i>Alternaria</i> sp.
<i>Alcaligenes</i> sp.	<i>Aspergillus niger</i>
<i>Bacillus</i> sp.	<i>Aspergillus</i> sp.
<i>Burkholderia cepicia</i>	<i>Blastomyces dermatitidis</i>
<i>Chrysomonas huteola</i>	<i>Candida albicans</i>
<i>Enterobacter cloacae</i>	<i>Penicillium</i> sp.
<i>Entreococcus faecalis</i>	
<i>Flavobacterium</i> sp.	
<i>Gamella morbillorum</i>	
<i>Haemophilus</i> sp.	
<i>Micrococcus luteus</i>	
<i>Moraxella</i> sp.	
<i>Staphylococcus aureus</i>	
<i>Staphylococcus capitis</i>	
<i>Staphylococcus epidermidis</i>	
<i>Streptococcus sciuri</i>	

Arabia, so this study attempt to established a baseline about nosocomial infections, and also the present study using recent advance in microbial identification techniques (Patrick *et al.*, 2003; CDC 2003). Microbial contamination of hospitals will recognize in different places of the world (Suzuki *et al.*, 1984; Wong and Nye, 1991; Moussa and Arab, 1999; Alice *et al.*, 2000. Beyer and Belsito, 2000; Nunez *et al.*, 2000; Schultz *et al.*, 2003; Tayfour *et al.*, 2005).

The results of the present study for enumerating microorganisms found to be reproducible and give relatively representative high yield of microorganisms compared to the results obtained by other study (Guillaume *et al.*, 1984).

All environmental surfaces in the burn unit should be kept visibly clean at all times and all spills should be cleaned up promptly, and the moist surfaces may serve the hypothesis that moist surfaces may serves as source of microorganisms in burn units, identification of such sources of microorganisms in burn units, identification of such sources may be helpful in preventing transmission of such noscomial pathogens, also healthcare workers are responsible for preventing and controlling this infection (Mobasheri-zadeh *et al.*, 2005).

The present study highlights the microbial contamination of burn units in both hospital, each hospital must have an effective infection control

program under the direction of an infection control committee, which should include the following members:

- A The hospital epidemiologist
- B A representative from each major clinical department
- C A member of the pathology laboratory.
- D The infection control nurse.
- E Liaison members from pharmacy, housekeeping, central supply, inhalation, and local health department.

In general, the control of infection in the hospital environment centers around two main factors

- A The introduction of highly virulent, easily transmissible agents into the hospital

environment by patients, visitors, or hospital personnel.

- B The transmission of relatively a virulent normal flora-type organisms to compromised patients or routine hospital procedure (Jensen and Wright, 1989).

Stringent control procedure have been adopted by most hospitals in order to reduce the occurrence of nosocomial infections.

ACKNOWLEDGMENTS

This study is supported by College of Science Research Center No. (Bot/2006/52). My extend thanks also to Mrs. Khadija Yousef from Al-Hada Armed Forces Hospital for her cooperation and assistant for microbial isolation and identification.

REFERENCES

1. Alice, N. Neely, M. Maley, M. Survival of Enterococci and Staphylococci on hospital fabrics and plastic. *Clinical Microbiology*. **38**(2): 724-726 (2000).
2. Beyer, D. Belsito, D. Fungal contamination of outpatient examination rooms: is your office safe. *Dermatology Nurse*. **12**(1): 51-53 (2000).
3. Brooks, G.F. Butel, J.S. and Ornston, L.K. Medical Microbiology. Prentice-Hall International Inc., New Jersey (1995).
4. Centers for Disease control and prevention. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Health-Care infection Control Practices Advisory Committee (HICPAC). *MMWR*. (RR-10): **52**, 27-28 (2003).
5. Guillaume, K. Podglajen, I. Vauper, S. Molecular Epidemiology of extended-spectrum Beta-lactamase-producing *Enterobacteriaceae* isolated from environmental and clinical specimens in a cardiac surgery intensive care unit. *Infection control and hospital epidemiology*. **25**(10): 852-855 (2004).
6. Jensen, M. Wright, D. Introduction to Microbiology for Health Sciences. Prentice-Hall International. Editions (1989).
7. Mobasherizadeh, S. Abu-Shahidi, S. Mohammadi, N. Abuzari, F. Intervention study of needle stick injury in Iran. *Saudi Med. J.* **226**(8): 1225-122 (2005).
8. Moussa, A.M. and Arab. A.A. Managing Multiple-resistant *Staphylococcus aureus* as a result of Physician-Pharmacist Cooperation: A case of Report. *Saudi Pharmaceutical Journal*, **7**(4): 223-227 (1999).
9. Nunez, S. Morreno, A. Green K. The stethoscope in the emergency department: a vector of infection. *Epidemiology infection*. **124**(2): 233-237 (2000).

10. Patrick, M. Baron, E. Jorgensen, J. Yolken, R. *Manual of Clinical Microbiology*. ASM. Press. Washington. DC (2003).
11. Schultz, M. Gill. J. Zubairis, Huber. R. Zubairi, S. Huber. R. Gordin, F. Infection control hospital. *Epidemiology*. **24**: 302-303 (2003).
12. Suzuki, A. Namba, Y. Matsura, M. Horisawa, A. Bacteriology contamination of floors and other surfaces in operating rooms: a five years survey. *Journal of Hygiene*. **93** (3): 559-566 (1984).
13. Tayfour M.A. Al-Ghamdi, S.M. Al-Ghamdi, A.S. Surgical wound infections in King Fahad Hospital at Al-Baha. *Saudi. Med. J.* **26**(8) 1305-1307 (2005).
14. Wong, D. Nye, K. Hollisp. Microbial Flora on doctors white coats. *British. Medical. J.* **303** (6817): 1602-1604 (1991).