SUMMARY

- **Title:** Nosocomial Infections in the Intensive Care Units; National Hospital Sri Lanka
- Research Institute: National Hospital, Sri Lanka.
- Chief scientific investigator: Dr J.K.P. Wanigasuriya.
- Period of contract: 20.12.1995 - 31.12.1996
- objectives of the project:

(a) To study the incidence, pattern, and aetiological agents of nosocomial infetions in the intensive care units.

(b) To study the difference in the incidence of infections in the medical and surgical intensive care units.

(c) To identify factors contributing to nosocimial infections in ICU environment.

(d) To study the complications of peritoneal dialysis with a special reference to peritonitis.

- **Experimental method:**

This study was done in two stages. In the stage one, the nosocimial infections in the Intensive Care Units were studied in detail. Medical Intensive Care Unit (MICU), Neurology Intensive Care Unit (NICU), Recovery Unit (RU) and the Dialysis Unit were included in the study. It was not possible to include the Surgical Intensive Care Unit (SICU) and the Accident Service Intensive Care Unit (ASICU) due to the rapid turn over of patients in these units. There were several problems in the follow up of patients in the medical wards. Those patients who stayed in the ICUs over 24 hours were included in the study. They were observed daily for evidence of nosocomial infections. Diagnosis was made according to specified criteria. Microbiological analysis was done at the Department of Microbiology, National Hospital Sri Lanka t identify the causative agents and antibiotic sensitive patterns.

In the stage two of the study, 55 patients admitted to dialysis unit National Hospital, Sri Lanka over a five month period were studied. These patients were followed up after commencement of peritoneal dialysis for evidence of complications. Samples of dialysis effluent was analysed at the Renal Research Lab for total white cell count and differential counts. Culture and antibiotic sensitivity tests were done at the Microbiology Department, National hospital.

- **Results and discussion :**

Surveillance of nosocimial infections in the ICUs revealed that the chest infections were the commonest infection (28.4%) acquired during the ICU stay. Reported figures from other countries range form 21-71%. This variation is probably due to the low specificity of diagnostic criteria. The diagnosis of nosocomial pneumonia is not always easy in the ICU patient. Most of these patients have serious underlying disease and several other reasons for elevated body temperature and leucocytosis. Chest X ray changes consistent with pneumonia may be caused by pulmonary oedema, pulmonary infarction, atelectasis or haemorrhage. Blood cultures were done in 09 out of 30 patients with pneumonia and the culture became positive in only one patient. The low yield form the blood cultures could be due to the antibiotic therapy at the time of taking blood cultures. Therefore blood cultures may not be a useful way to isolate pathogens from this group of patients. Culture of endotracheal aspirate is the method used most commonly in our ICUs to isolate the pathogens. The commonest organism isolated was coliforms. However, the culture and microscopic examination of endotracheal secretions are of limited value as the upper airways of ICU patients are frequently colonises with potential pathogens. The clinician should differentiate colonisation from actual infection as the former does not require antibiotic therapy. The patients who were ventilated had a higher risk of developing pneumonia.

Urinary tract infections occurred in 26% of patients. All the urinary tract infections were associated with indwelling catheters and 22.5% of catheterise patients developed urinary tract infections. Commonest pathogenic organism was coliforms. All these infections were mild and responded to catheter removal and antibiotic therapy. The venflon site infections were also common but major complications were

rare. Surgical wound infections were not a major problem in this group of patients. The observations with regard to general hygiene in the ICUs were not satisfactory.

Fifty five patients who underwent dialysis in the dialysis unit during the period of study developed many complications. Peritonitis was the commonest complication observed in this group of patients. Culture of dialysis effluent has shown that coliforms were responsible for the majority of cases of peritonitis. *Pseudomonas* and *staphylococcus aureus* were isolated in few cases. This was a major difference seen when compared to studies done in western countries involving chronic PD. These studies show that staphylococcus epidermidis is the commonest organism to cause peritonitis followed by other gram positive organisms like staphylococcus aureus. The likely source of coloforms in peritonitis remains unclear. The transmural migration of coliforms through the bowel wall is thought to be theoretically possible, but contamination through the hands of nursing staff and other formites is also possible. Antibiotic sensitivity pattern in these organisms showed that the colifoms were resistant to most of the first line antibiotics including ampicillin, cortimoxazle and gentamicin. The organisms were highly sensitive to netimicin, ceftazidime and amoxycillin/clavulinic acid preparation. Therefore isolation of the causative agent and availability of antibiotic sensitivity pattern is valuable in the proper management of these patients.

Conclusions:

Nosocomial infections are common in Intensive Care Units in the National Hospital, Sri Lanka. There is a high incidence of peritonitis in patients undergoing peritoneal dialysis which is far too high for simple life saving procedure. The micro organisms responsible are usually gram negative bacilli. Steps should be taken to improve microbiological diagnosis as the identification of the causative agent is helpful in the proper management. Rational use of antibiotics should be encouraged as it will decrease the emergence of resistant organisms. More emphasis should be given on the prevention of these infections and there is an urgent need to improve the general hygienic standards in the intensive care units. .