SUMMARY

Neonatal septicemia remains a major clinical problem in neonatology with high morbidity and mortality rates despite the progress in neonatal intensive care and antibiotics. Due to this high mortality and morbidity in this vulnerable population, it was necessary to make efforts to prevent this highly deleterious infection.

Infection control is a relatively new discipline, which is concerned with the prevention of nosocomial infections in order to protect both the patients and the HCWs.

The aim of this work is to identify the impact of applying infection control program on nosocomial neonatal BSI in the NICU.

This work was carried out in the Microbiology & Immunology Department and Pediatric Department, Faculty of medicine, Benha University in the period from June 2005 to January 2006.

To achieve our goal, it was at first necessary to identify the present state of the study NICU, regarding the current rate of NIs, the endemic pathogens, and the possible risk factors associated with NIs. This was the aim of the ***first stage*** of this study -the "*initial surveillance stage*"- which is a prospective cross-sectional survey. The first stage had covered 30 newly admitted neonates over two months period.

The ***2nd Stage*** (*infection control application stage*): This stage had began with tracing the source of the prevalent pathogen(s) isolated from septic neonates in the course of the first stage. Tracing was a key stone step, it helps to identify possible problems in the NICU to be stressed in the infection control program. During this stage, polices of infection control was defined and distributed and Health education program was conducted.

To measure the outcome of the intervention, a second surveillance period was needed. ***Stage 3 (the terminal surveillance stage)*** consists of a second period of surveillance. Stages 3 had covered 30 newly admitted neonates over 2 months period.

During the two surveillance periods (Stage I and Stage II) each newly admitted neonate was subjected to the following:

- Data collection on a special form which includes personal data, obstetric data, possible risk factors, treatment & interventions.
- C reactive protein analysis.
- Blood culture and sensitivity of isolated bacteria.

The results of this study showed that:

- The nosocomial infection rate was 45% during the first surveillance stage. After applying the infection control program the rate had dropped to 14%.
- The mortality rate had dropped from 27% to 7% after applying the infection control program ($P < 0.05$).
- The mean Stay period had dropped from 9.53 to 6.6 days, but this drop was statistically insignificant ($P > 0.05$).

- *Klebsiella pneumoniae* was the commonest organism isolated in stage I (64%). Followed by CoNS and *Candida albicans* (each 18%).
- All of the isolated strains of Klebsiellae from NI cases were multidrug resistant. They all were totally resistant to third generation cephalosporins.
- The source of Klebsiella was traced to water sink, feeding bottles, and liquid soap containers.
- Nosocomial infections were significantly positively related to stay-period, artificial respiration and blood or plasma transfusion.
- Nosocomial infections were significantly inversely related to birth weight (P = 0.047) and gestational age (0.004).

In conclusion:

- Infection control program was highly effective in controlling nosocomial neonatal septicemia.
- Infection control program had reduced mortality rate in the study unit.
- Infection control programs are simple, inexpensive, but effective.
- Multiple drug resistance was an obvious problem in all nosocomial isolates.
- Important pathogens like pseudomonas were isolated from the hands of HCW.

RECOMMENDATIONS

According to the results of this study, the following is recommended:

- Infection control programs are mandatory and should be implemented in all hospitals.
- Efforts should be made to control drug resistance.
- Further studies are needed to measure the effectiveness of each interventional measure alone.