To study Extended Spectrum Beta-Lactamase Producing Organisms in Neonatal Septicemia in a Tertiary Care Hospital

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Background

Neonatal mortality in developing countries accounts for 30 – 50 % of infant deaths. Almost 20% of neonates develop sepsis and 1% die of sepsis related causes. Frequently isolated causative pathogens (Klebsiella pneumonia, Staphylococcus aureus, Pseudomonas, etc) known to be ESBL (Extended Spectrum Beta-Lactmase) producers are resistant to third generation cephalosporins, penicillins as well as to monobactams. The rampant irrational use of ordinary and high end antibiotics is responsible for this bacterial resistance.

Aims & Objectives

To study micro-organisms and prepare an effective antibiogram policy to serve the helpless neonates.

Materials & Methods

Fifty suspected cases from Neonatal intensive-care unit (NICU) were selected on the basic clinical features based on Early and Late Onset Sepsis. 1-ml aseptically drawn venous blood incubated in 9-ml of Brain-Heart Infusion broth at 37°C for seven days, was observed for growth and sub-cultured on Blood agar and MacConkey's medium. Any organism from sub-culture was identified biochemically. Antibiogram test was done with Extended Spectrum antibiotics - cefpodoxime, ceftazidime, aztreonam, cefotaxime, ceftriaxone. Cefotaxime or ceftazidime disks with or without clavulanate were used for phenotypic confirmation as advocated by CLSI. A difference of >5mm between the zone diameter of either cepahlosporin disk and its respective cephaoshorin/ clavulanate disk was taken as phenotypic confirmation of ESBL production.

Results

16% of 50 samples showed positive cultures, 75% were gram negative and rest gram positive organisms. 25% of culture positive isolates were ESBL producer, Klebsiella spp. and E.coil being 12.5% each. All mentioned antibiotics were resistant to these ESBL producers. ESBL production was confirmed by phenotypic confirmation.

Conclusions

In presence of high resistance it becomes imperative to detect resistance patterns against different anti-microbial agents, for the septic neonates in NICU. With increasing levels of resistance, a careful and constant monitoring of antibiotic usage at regional and national level is sought.