INTRODUCTION

Sepsis is a commonly encountered and potentially life-threatening problem in neonatal intensive care units (NICU). It is defined as a deleterious host response to infection documented by a positive blood culture in the first 4 weeks of life eventually leading to septic shock and multi organ failure (Gheorghita et al., 2015; Chen et al., 2014; Singh et al., 1991). Sepsis is the commonest cause of mortality in neonates which is responsible for about 30-50% of neonatal mortality in the developing countries (Bang et al., 1999; Stoll, 1997; Sharma et al., 2013). The mortality from septicaemia prior to the antibiotic era was 90%, but it declined with the use of antibiotics to 24-58% (Kaushik et al., 1998). Neonatal infections can be acquired in utero through ruptured membranes or transplacentally, intrapartum in the birth canal during delivery and postpartum from external sources after birth leading to sepsis in the newborn. Most commonly it occurs through an infected birth canal. Sometimes ascending infection can also occur if delivery is delayed after rupture of membranes. Sepsis related neonatal mortality is largely preventable with prevention of sepsis, its timely recognition, rational antimicrobial therapy and aggressive supportive care.
Blood culture is the gold standard for diagnosis of septicemia and should be performed in all cases of suspected sepsis prior to starting antibiotics (Ng et al., 2010). The emergence of multi-drug resistant strains has however limited the choice of available antibiotics. Thus, understanding the antibiotic resistance pattern of common neonatal pathogens is critical for both effective therapy and infection control. The present study was undertaken to determine the bacteriological profile and antimicrobial susceptibility pattern of prevalent pathogens isolated from the blood of septicemic neonates from Neonatal Intensive Care Unit (NICU) of GMCH, Chandigarh.

MATERIAL AND METHODS

We conducted a review of hospital records to examine the bacterial organisms and their drug-sensitivity in blood cultures collected from neonates admitted in NICU of our tertiary-care hospital in Chandigarh between July 2016 and June 2017. Blood samples of these neonates were collected with strict aseptic precautions. The blood samples were processed by conventional blood culture and identification of the organism was done by standard bacteriological techniques including Gram staining, colony characteristics, and biochemical properties (Collee et al., 1996). Antibiotic sensitivity was performed by Kirby Bauer disc-diffusion method in accordance to Clinical Laboratory Standards Institute (CLSI) 2016 guidelines (Wayne, 2016).

RESULTS

A total of 1521 blood samples were received from NICU. Of these, bacteraemia could be confirmed by culture in 12.3% (187/1521) cases. In the present study, Gram-negative organisms predominated being responsible for 76% (142/187) of cases of septicaemia followed by the gram positive organisms in 24% (45/187) cases. Amongst the Gram positive organisms, Staphylococcus aureus was the most common [17.1% (32/187)] with 6.3% being MRSA. The other gram positive organisms obtained were Enterococcus faecalis 3.74% (7/187) and Coagulase Negative Staphylococcus (CONS) [3.20% (6/187)]. All Enterococci were sensitive to vancomycin. The most effective drugs in Gram negative organisms were imipenem and piperacillin-tazobactam while in Gram positive organism’s vancomycin and gentamicin were found to be the most effective antimicrobials.

DISCUSSION

In the absence of prescription auditing people go for over the counter drugs and ultimately leading to misuse of antimicrobials which has contributed to a rise in antimicrobial resistance. The measures for improving the prescription practices of the doctors and documenting trends of resistance over the years would guide us in reducing the burden of antimicrobial resistance and determining future usage of antibiotics. In our study, Klebsiella pneumoniae continues to be the major pathogen along with E.coli and Staphylococcus aureus similar to findings by Kumhar et al. 2002 and Anwer et al. 2000. An alarming finding in our study was the emerging carbapenem resistance which could be due to the widespread use of carbapenems in ICU and this problem of resistance could be tackled by stringent infection-control practices, regular antibiotic susceptibility surveillance and by the use of a rational antibiotic policy. Carbapenem sparing drug for NICU can be piperacillin-tazobactam. There cannot be a single recommendation for the antibiotic regimen of neonatal sepsis for all settings. The choice of antibiotics depends on the antimicrobial sensitivity of the isolated bacterial pathogens.

REFERENCES


