## CURRENT ABSTRACTS:

### THE ROLE OF INTRAPARTUM FEVER IN IDENTIFYING ASYMPTOMATIC TERM NEONATES WITH EARLY-ONSET NEONATAL SEPSIS

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**OBJECTIVE:** To assess the role of intrapartum fever in identifying asymptomatic term neonates with early-onset neonatal sepsis. STUDY DESIGN: Retrospective review of all term neonates with sepsis over a 7-year period to evaluate the significance of symptoms at delivery and intrapartum sepsis risks factors in identifying neonates with sepsis. RESULTS: Fifty-three of 90 term neonates with sepsis (59%) were asymptomatic at delivery. Thirty-five of 53 asymptomatic term neonates (66%) met criteria for sepsis evaluations and 18 (34%) were evaluated when symptoms developed after delivery. Among the 35 asymptomatic term neonates meeting criteria for sepsis evaluations, 14 (40%) had evaluations because of intrapartum fever. Thus, 14 of 53 (26%) asymptomatic term neonates with sepsis (30% of GBS sepsis and 11% of non-GBS sepsis) would not have been evaluated if intrapartum fever were ignored. CONCLUSION: Over half of term neonates with sepsis were asymptomatic at delivery. Intrapartum fever was helpful in identifying over a quarter of asymptomatic term neonates with sepsis.

### MATERNAL EPIDURAL USE AND NEONATAL SEPSIS EVALUATION IN AFEBRILE MOTHERS

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**OBJECTIVE:** Epidural use has been associated with a higher rate of neonatal sepsis evaluation. Epidural-related fever explains some of the increase but not the excess of neonatal sepsis evaluations in afebrile women METHODS: We studied 1109 women who had singleton term pregnancies and who presented in spontaneous labor and were afebrile during labor (<100.4 degrees F). Neonatal sepsis evaluation generally was performed on the basis of the presence of 1 major or 2 minor criteria. Major criteria included rupture of membranes for >24 hours or sustained fetal heart rate of >160 beats per minute. Minor criteria included a maternal temperature of 99.6 degrees F to 100.4 degrees F, rupture of membranes for 12 to 24 hours, maternal admission white blood cell count of >15 000 cells/mL(3), or an Apgar score of <7 at 5 minutes. RESULTS: Infants of afebrile women with epidural analgesia were more likely to be evaluated for sepsis than infants of women without epidural (20.4% vs 8.9%), although not more likely to have neonatal sepsis. An increased risk of sepsis evaluation persisted in regression analysis (odds ratio: 3.1; 95% confidence interval: 2.0, 4.7) after controlling for confounders and was not explained by longer labors with epidural. Women with epidural were significantly more likely to have major and minor criteria for sepsis evaluation, including fetal tachycardia (4.4% vs 0.4%), rupture of membranes for >24 hours (6.2% vs 3.4%), low-grade fever of 99.6 degrees F to 100.4 degrees F (24.3% vs 5.2%), and rupture of membranes for 12 to 24 hours (21.4% vs 5.2%) than women without epidural. CONCLUSIONS: Epidural analgesia is associated with increased rates of major and minor criteria for neonatal sepsis evaluations in afebrile women.

### NEONATAL SEPSIS: HIGH ANTIBIOTIC RESISTANCE OF THE BACTERIAL PATHOGENS IN A NEONATAL INTENSIVE CARE UNIT IN KARACHI.

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**OBJECTIVE:** To study the bacterial pathogens causing neonatal sepsis and their sensitivity pattern so that guidelines can be prepared for empirical antibiotic therapy. SETTING: The study was conducted in the neonatal intensive care unit (NICU) at PNS Shifa (Naval Hospital), Karachi during January 1997 to June 1999. METHODS: Blood specimens for culture were drawn

from 520 newborns admitted in a NICU with sepsis. The specimens were inoculated into brain heart infusion broth. Subcultures were performed on days 1, 2, 3, 5, 7 and 10. The isolates were identified by standard biochemical tests. Antibiotic resistance pattern of the isolates was studied by Modified Kirby Baur disc diffusion technique. RESULTS: A total of 212 organisms were isolated. These included Staphylococcus aureus (n = 65), Klebsiella pneumoniae (n = 73), Acinetobacter baumannii (n = 23), Escherichia coli (n = 22), Enterobacter cloacae (n = 18), Citrobacter diversus (n = 5), Pseudomonas aeruginosa (n = 4) and group B Streptococcus (n = 2). On antibiotic sensitivity testing, 61.54% of Staphylococcus aureus isolates were found to be methicillin resistant. Susceptibility to the other common drugs was also quite low while 89.23% of these were susceptible to amikacin and 100% to vancomycin. More than 90% gram negative rods were resistant to ampicillin and co-trimoxazole. Resistance to gentamicin was as high as 90.4% for Klebsiella pneumoniae; 60.87% for Acinetobacter baumannii. Resistance to the third generation cephalosporins and the quinolone tested (ciprofloxacin) varied between 25-75%. Majority of the isolates were susceptible to meropenem and amikacin. CONCLUSION: In view of the isolation of highly antibiotic resistant organisms, vancomycin in combination with amikacin or a carbapenem is the drug of choice for empirically treating neonatal sepsis.

## NEONATAL SEPTICAEMIA IN ILORIN: BACTERIAL PATHOGENS AND ANTIBIOTIC SENSITIVITY PATTERN.

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All cases of septicemia among neonates admitted to the neonatal intensive care unit of the University of Ilorin Teaching Hospital, Ilorin, Nigeria between Jan 1995 and Dec 1996 were studied. Our aims were (1) to assess the incidence and microbial epidemiology of neonatal sepsis, (2) to generate baseline data and necessary research question for a proposed study on predictors of neonatal sepsis in our centre. Microbiology records of patients with confirmed septicemia was reviewed. Each of these babies had a single venous blood sample from a peripheral vein taken under aseptic conditions and before commencement of antibiotics. The needed data were entered into a proforma. Of the 198 neonates screened for sepsis, there were 61 (30.8%) positive blood cultures. Twenty-nine (48%) of these were inborn. The total number of live births in the hospital during the study period was 4118, thus giving a hospital-based incidence of neonatal sepsis of 7.04/1000 for in-born patients. The male:female ratio was 1.2:1. Overall Staphylococcus aureus was the commonest pathogen, accounting for 18 (29.5%) of the total isolates. Other pathogens were as follows: coagulase negative Saphylococcus albus 15 (24.6%), Klebsiella spp 10 (16.4%) and unclassified Coliforms 9 (14.8%). The predominant organisms in the first 48 hours were Gram negative bacilli; accounting for (70%) of the 10 isolates. Between 3 and 7 days of life the Gram positive cocci accounted for 12 (60%) of the 20 isolates while the Gram negative bacilli represented 40%. After 7 days, the predominant organism was Staphylococcus aureus (38.8%) while coagulase-negative Staphylococci were isolated in 7 of 31 isolates (22.6%). The sensitivity pattern showed that 94% of the organisms were sensitive to azythromicin, 77.8% to streptomycin, 73.3% to gentamicin and 69.2% to ampicillin-sulbactam. For the cephalosporins the isolates showed a sensitivity rate of 69% to ceftriaxone, 66.7% to ceftazidime and 58.3% to cefuroxime. As a group the Gram positive organisms had 100% sensitivity to Azythromcin, 85% to ampicillin-sulbactam, 63% to ceftazidime and 62.5% to gentamicin. In the Gram negative group, the best overall sensitivity was to ceftriaxone (86.4%). Gentamicin had 85.7% while sensitivity to ceftazidime was 60%. The distribution of the organisms causing early and late onset sepsis were different. For early onset sepsis, the Gram negative bacilli as a group were the commonest organisms while Staphylococcus aureus was the commonest cause of late onset sepsis. There was a lower incidence of sepsis compared to reports from other parts of the country. This, in addition to differences in antibiotic sensitivity pattern call for more multi-centre studies on predictors of neonatal sepsis. The antibiotic sensitivity profiles suggest that the initial empirical choice of ampicillin-sulbactam and gentamicin appears to be the most rational for our environment.

# PREDICTIVE VALUES OF SERIAL C-REACTIVE PROTEIN IN NEONATAL SEPSIS.

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**BACKGROUND:** Infection is one of the major problems in neonates. The diagnosis of neonatal septicemia is difficult to establish based on the clinical criteria alone. However, empirical treatment should not be delayed because of the high mortality. Laboratory tests used to support diagnosis have shown variable predictive values. C-reactive protein (CRP), an acute phase protein, increases in inflammatory disorders and tissue injury. Serial CRP have been shown to be more useful than a single measured CRP in the diagnostic evaluation of neonates with suspected infection. OBJECTIVES: 1. To evaluate the diagnostic accuracy of serial CRP in neonatal sepsis. 2. To compare the diagnostic values between CRP and leukocyte index from a complete blood count (CBC). METHOD: A prospective observational study included newborn infants, aged > 3 days and diagnosed with clinical sepsis, who were admitted in the newborn intensive care unit and special care nursery at Ramathibodi Hospital during a 14-months period. Newborn infants who received antibiotics prior to septic work up were excluded. CRP levels were measured initially at the time of septic work-up and at 24-48 hours later. Investigations for infection included CBC, blood culture and urine culture. Radiological study and lumbar puncture were performed if clinically indicated. Based on clinical and biological data, diagnosis of infants can be categorized into 4 groups as follows; (1) proven sepsis with positive culture, (2) localized infection with negative culture, (3) probable infection (clinically consistent with sepsis, negative culture without localized infection), and (4) no infection (findings not consistent with sepsis and antibiotics were discontinued within 3 days). Diagnosis was made before the CRP results were known. RESULTS: Of 76 newborn infants with 90 episodes of clinical sepsis, there were 24 episodes of proven sepsis, 11 episodes of localized infection with negative culture, 18 episodes of probable infection and 37 episodes of no infection. Serial CRP had better predictive values than those of CBC. The sensitivity, specificity, positive predictive value, and negative predictive value of CRP for proven sepsis and localized infection at cutoff point > or = 5 mg/L were 100 per cent, 94 per cent, 91.6 per cent and 100 per cent respectively. False positive CRP were found in post-operative patent ductus arteriosus ligation, intracerebral hemorrhage, and post resuscitation with chest compression. To improve the predictive value of CBC, analysis of the receiver operating characteristic (ROC) curve showed that the predictive value of CBC for sepsis would be enhanced by using abnormal leukocyte index 2 2 parameters. CONCLUSIONS: Predictive value of CRP could be enhanced by serial rather than a single measurement. Serial CRP showed very high predictive values for diagnosis of neonatal sepsis and were better than those of leukocyte indices of CBC.