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STUDY OF CLINICAL PROFILE, RISK FACTORS AND MARKERS OF NEONATAL SEPSIS IN NEONATES ADMITTED IN NEONATAL INTENSIVE CARE UNIT IN A TERTIARY CENTRE CARE HOSPITAL : A PROSPECTIVE HOSPITAL BASED STUDY

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ABSTRACT – 62 neonates were admitted in the neonatal intensive care unit of a tertiary care centre hospital. Diagnosis of neonatal sepsis was based on Clinical features like fever, respiratory distress, lethargy/irritability, convulsions, bulging fontannels, refusal to feed, jaundice, bleeding, abdominal distension, and temperature dysregulation. Pathological parameters used for diagnosis in this study include CRP, Total leucocyte count and Immature to total neutrophil ratio which are a part of sepsis screen. In this study we aim to evaluate risk factors and evaluate Clinico-pathological correlation of neonatal sepsis.

KEYWORDS – Sepsis screen , Clinico-pathological correlation

INTRODUCTION

Neonatal sepsis is defined as a systemic condition of bacterial, viral, or fungal origin that is associated with haemodynamic changes and other clinical manifestations and results in substantial morbidity and mortality.

The clinical presentations of neonatal sepsis are nonspecific. This includes symptoms like fever, respiratory distress, lethargy/irritability, convulsions, bulging fontannels, refusal to feed, jaundice, bleeding, abdominal distension, and temperature dysregulation.

Early-onset sepsis presents within 72 hrs of life, and late-onset sepsis presents beyond 72 hours of life.

EOS presents where the maternal genital tract is the source of ascending infection. Maternal risk factors like premature rupture of membranes (PROM), chorioamnionitis, peripartum fever, urinary tract infection within 2 weeks prior to delivery and prolonged rupture of membranes > 24hours, multiple gestations, and caesarean sections are associated with increased risk of EOS.

The risk factors associated with LOS are prematurity, prolonged invasive interventions, like mechanical ventilation and intravascular catheterization, failure of early enteral feeding with breast milk, long duration of parenteral nutrition, hospitalization, surgery, and underlying respiratory and cardiovascular diseases.

The objective of this study was to evaluate the risk factors, clinical profile and clinic-pathological correlation of neonatal sepsis of neonates admitted to Neonatal Intensive Care Unit of MGM Hospital, Kalamboli.

METHODS AND MATERIALS

STUDY AREA -

MGM Hospital, Kalamboli is a tertiary care centre located in Navi Mumbai, Maharashtra, India. This hospital provides service to a population of approximately 15 lakhs size. In the hospital, there are different departments as pediatric, obstetrics and gyanecology, physiotherapy, outpatient and casualty.
It also provides emergency cesarean section and maternal waiting room in addition to the NICU.

STUDY DESIGN AND SAMPLE SIZE –

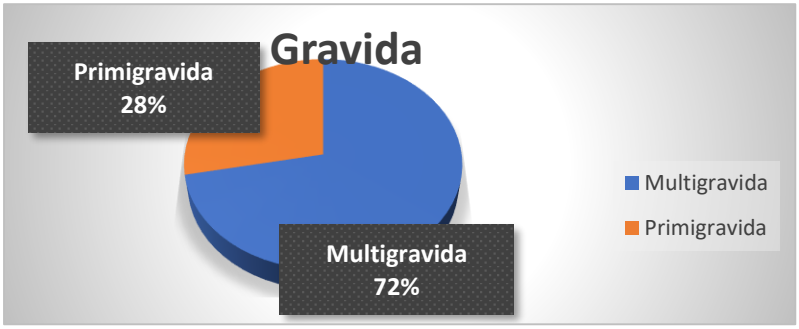
The study design was a prospective hospital based study of neonates admitted to MGM Hospital NICU during the study period. A total of 62 neonates were admitted to this NICU in the 1 month study period and all of them were enrolled in the study.

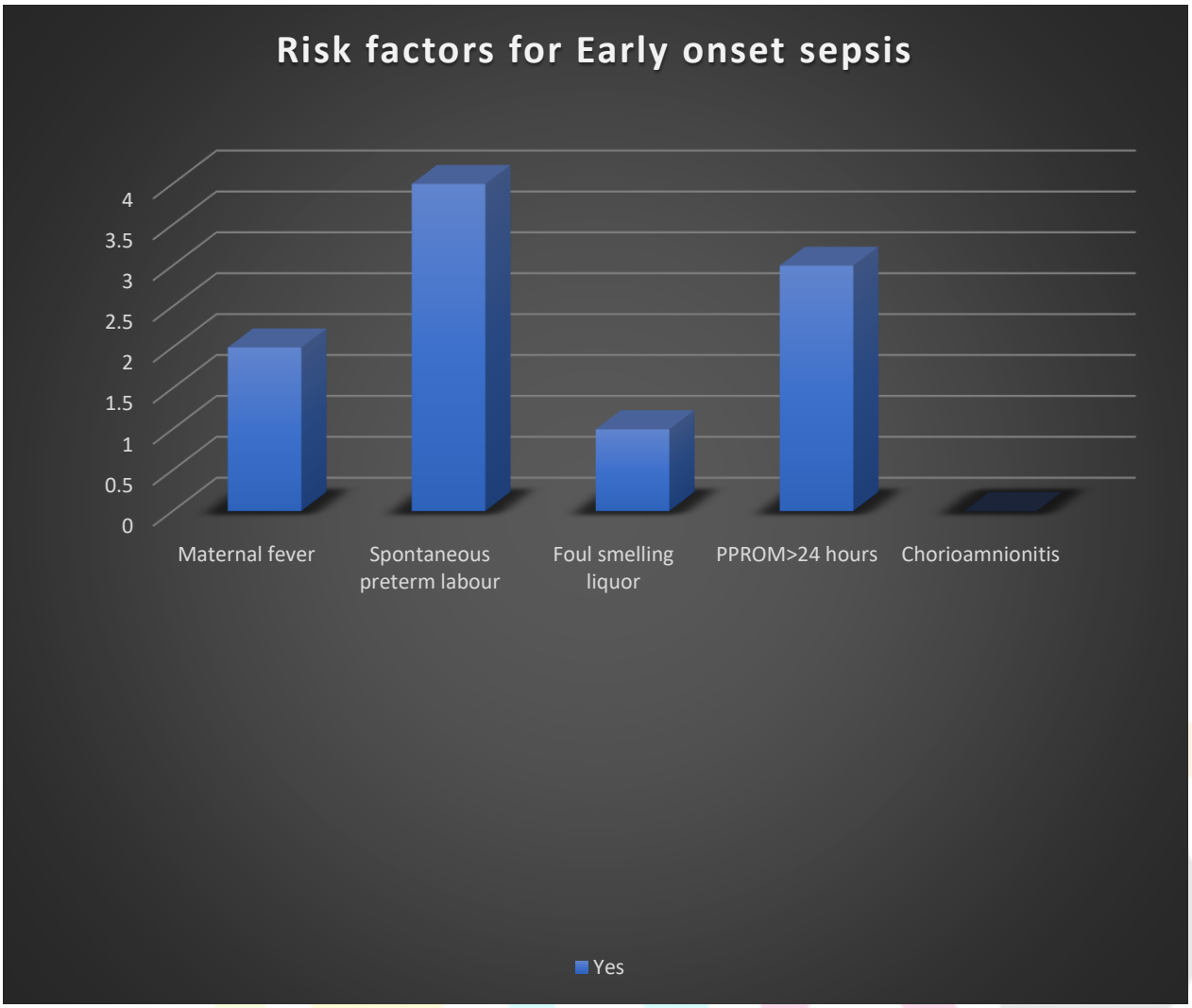
STUDY PERIOD AND POPULATION –

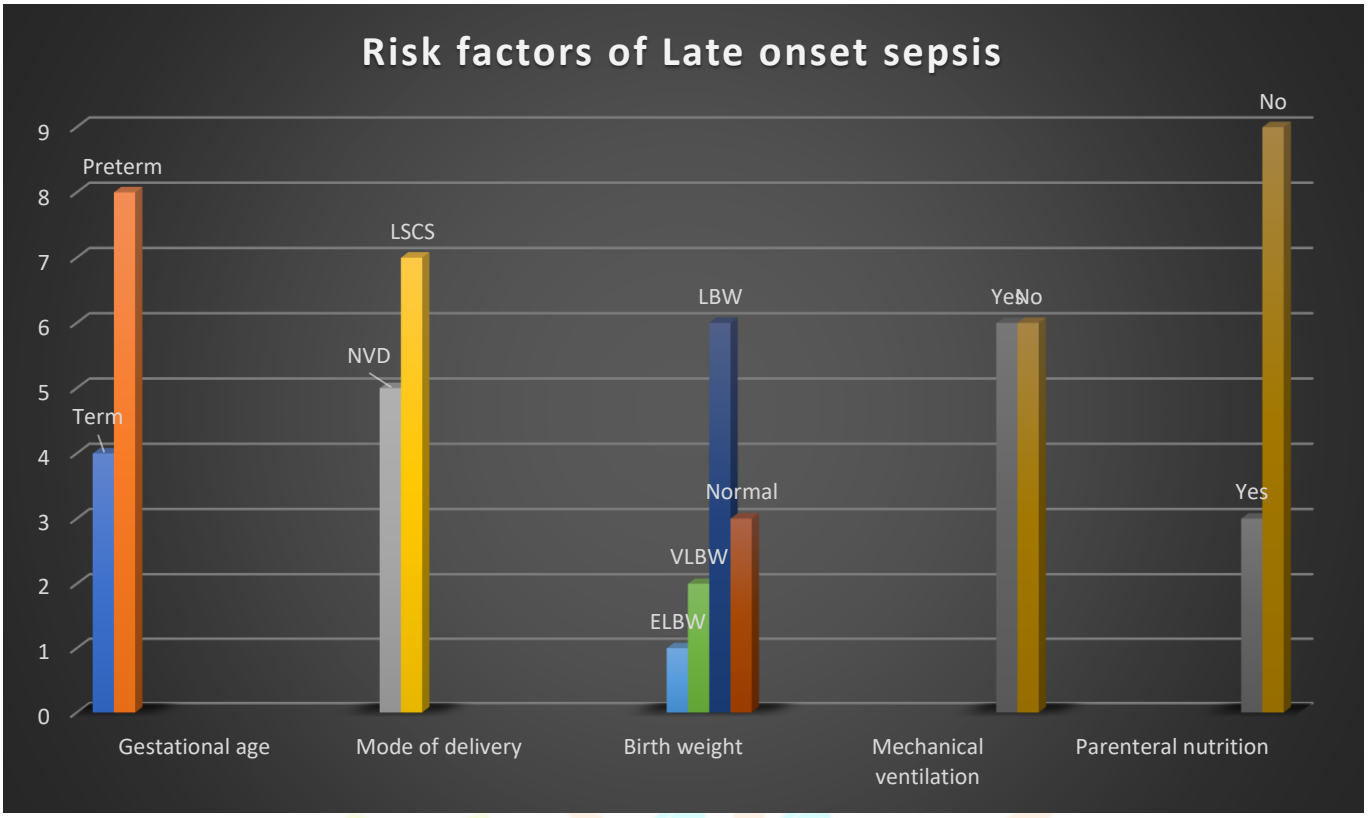
The study was conducted in NICU of MGM hospital from 1st April 2024 to 31st April 2024. All neonates who were admitted in NICU of MGM hospital during the study period were the study population of this study. All neonates in the register book with full information were included in the study.

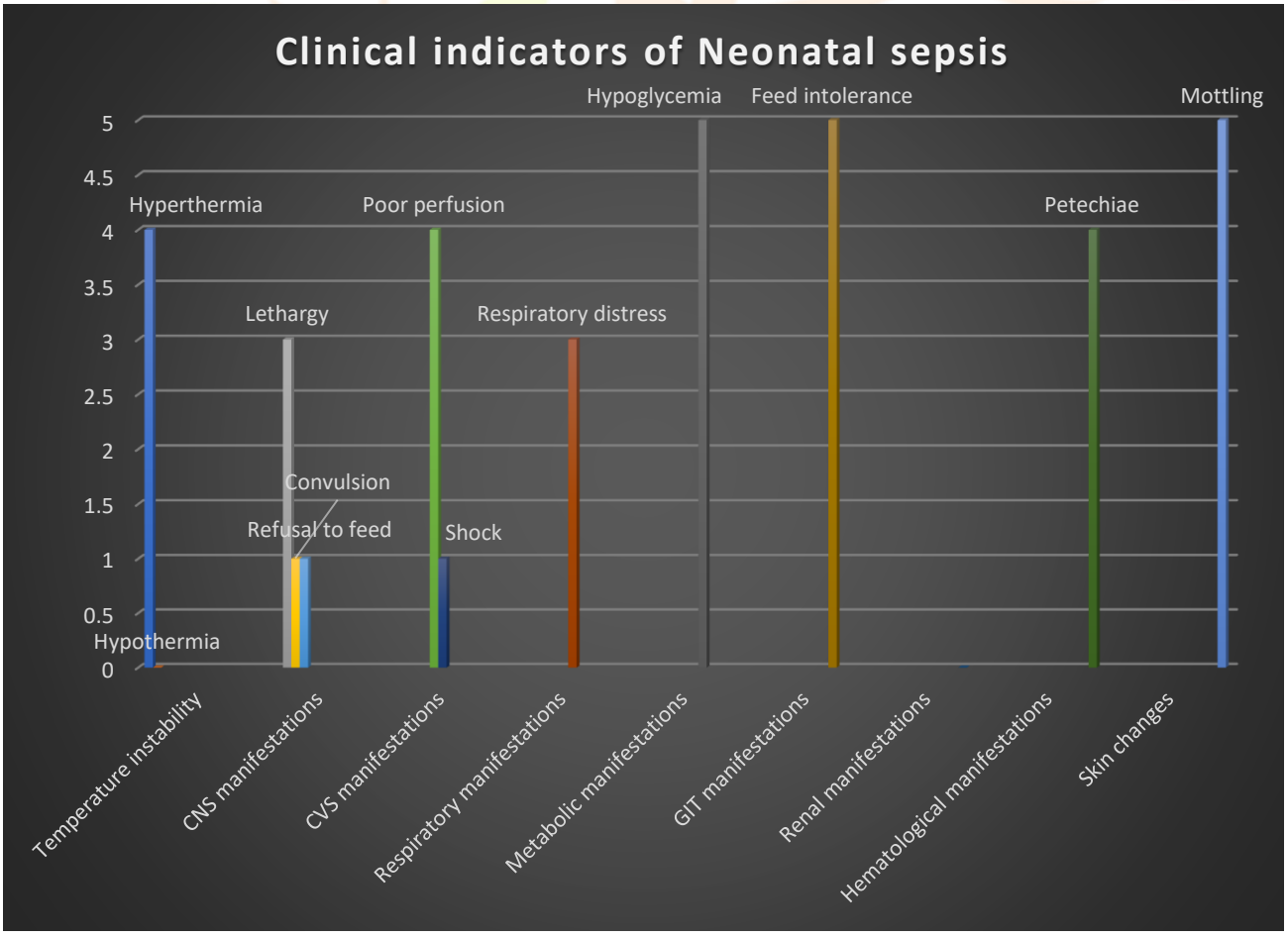
OPERATIONAL DEFINITIONS

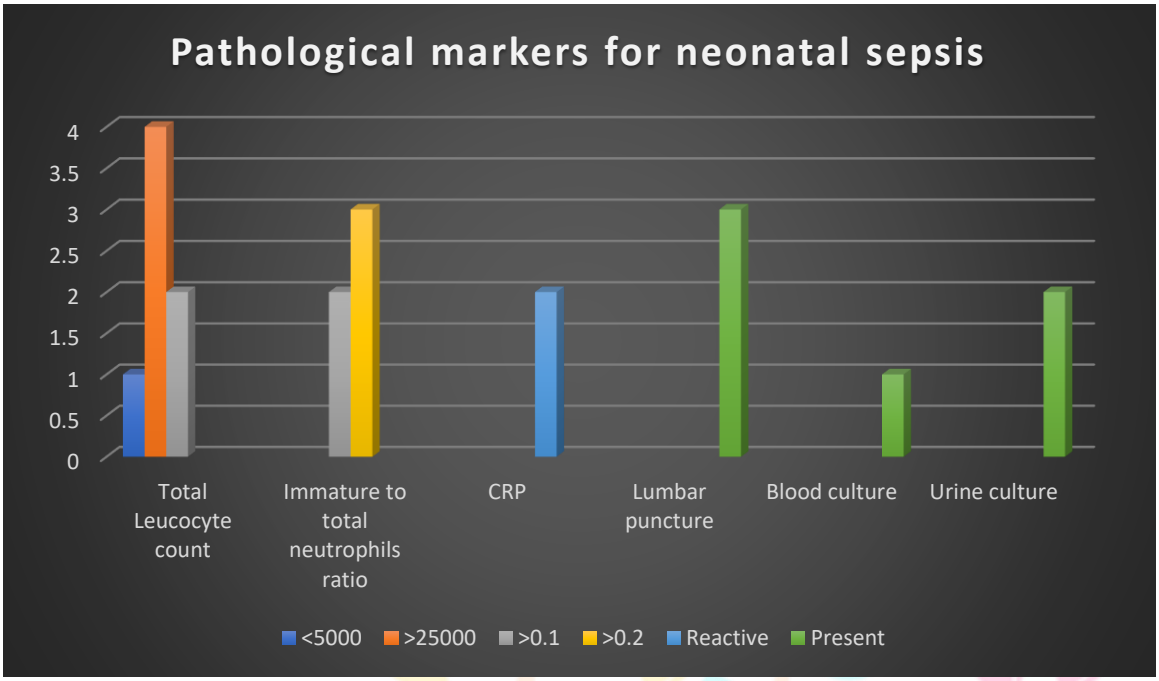
1) Clinical sepsis is defined as neonates who have signs and symptoms of neonatal sepsis with or without risk factors
2) Culture-positive/proven sepsis means neonates who have clinical sepsis with positive blood culture growths
3) ELBW is defined as birth weight<1kg, VLBW as birth weight<1.5kgs, LBW as birth weight<2.5kgs.
4) Hypothermia is defined as axillary temperature <36.5C.
5) Hyperthermia is defined as axillary temperature of >37.5C.
6) Feed intolerance is defined as inability to digest enteral feedings presented as Gastric residual volume >50%, abdominal distension or emesis or both.
7) Poor perfusion defined as having prolonged capillary refill time>3 seconds.
8) Petechiae are defined as pin point red non blanching measuring less than 3mm and purpura measure between 3-10mm and ecchymosis >1cm.
9) Mottling refers to development of lacelike pattern of dusky erythema over extremities and trunk.






Risk factors of Late onset sepsis
9
8
7
6
5
4
3
2
1
0
Preterm
Term
LSCS
NVD
LBW
Normal
VLBW
ELBW
Yes
No
No
Yes
Gestational age
Mode of delivery
Birth weight
Mechanical ventilation
Parenteral nutrition


Clinical indicators of Neonatal sepsis
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Hyperthermia
Hypothermia
Lethargy
Convulsion
Refusal to feed
Poor perfusion
Shock
Respiratory distress
Hypoglycemia
Feed intolerance
Petechiae
Mottling
Temperature instability
CNS manifestations
CVS manifestations
Respiratory manifestations
Metabolic manifestations
GIT manifestations
Renal manifestations
Hematological manifestations
Skin changes



RESULTS

In this study it was found that Incidence of Early onset sepsis(66.6%) was higher than Late onset sepsis(33.3%). The most common risk factor noted in my study for EOS was spontaneous preterm labour(40%) which was followed in decreasing order by PPROM(30%), Maternal fever history(20%), Foul smelling liquor(10%),Chorioamninonitis(0%) in decreasing order.

Gestational age was found to be a significant contributing factor and it was found that the incidence of neonatal sepsis was significantly higher in Preterms(66.6%) compared to 33.3% in Terms neonates.
Mechanical ventilation was also found to be a significant risk factor and it was found that 50% of neonates developed neonatal sepsis.
Birth weight was also found to be significant and incidence of neonatal sepsis was found to be higher in neonates having Low birth weight(Including ELBW,VLBW,LBW) 75%.

In the study it was found that the predominant clinical manifestation of neonatal sepsis was Hypoglycemia (13.8%), Feed intolerance(13.8%) and development of skin changes like Mottling(13.8%).
It was followed in decreasing order by Hyperthermia(11.1%), Lethargy(11.1%) Hematological manifestation like Petechiae(11.1%), Poor perfusion(11.1%) and Respiratory distress(8.3%). Other uncommon manifestations observed in the study include Convulsion(2.7%) and Shock(2.7%).

Laboratory parameters showed that Total Leucocyte count >25000/mm3 was seen in 33% neonates and those having <5000/mm3 was seen in 8.3%.
Immature to total neutrophil ratio was elevated >0.2 in 25% neonates and >0.1 in 41.6% neonates.
C-Reactive protein titres were elevated in 16.6% neonates.
CSF culture did not show any growth in my study.
Blood culture revealed growth in 12.5% neonates hence was a culture proven sepsis.
Urine culture did not reveal any growth in our study.

CONCLUSION

It was found that majority of neonatal sepsis were EOS which can be prevented by universal screening of all pregnant women by vaginal-rectal swab culture and treatment with appropriate antibiotics accordingly. Intrapartum penicillin or ampicillin is also recommended for women presenting in labour with unknown Group B streptococcus status.

As in our study, mechanical ventilation was also found to be a significant risk factor hence efforts should be made for early weaning off of ventilator.

In my study it was found that majority neonates showed non specific and subtle clinical signs hence a high index of suspicion is required for early diagnosis of neonatal sepsis.

It was also found that Laboratory parameters showed less correlation in neonates showing clinical features of sepsis hence further necessitating the importance of keeping a higher index of clinical suspicion of sepsis.