Risk factor analysis for neonatal sepsis and the outcome in tertiary care neonatal nursery

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Abstract---Background: Adequate care has to be taken to the new born child because there is large number of mortality in the age group of less than 5. Further most prevalent group is babies within day zero to day 28 after birth. Aim and Objective: The present study was undertaken to observe the risk factor analysis for neonatal sepsis and the outcome in tertiary care neonatal nursery. Material and Methods: New born babies with standard signs and symptoms of sepsis were part of the study after obtaining consent from their parents. The study was conducted between April 2019 to June 2020. Venous blood was drawn from the newborn babies after proper consent from parents and assessed for sepsis. These newborn babies were managed as per the hospital protocol and a predesigned and standard questionnaire was used to collect the data about the risk factors. Results: The most common organism isolated from blood culture was Klebsiella (36.9%). Other organisms isolated were Acinetobacter, Pseudomonas, E.coli, Staphylococcus aureus, Proteus and Citrobacter. 1% had culture positive for Non Candida albicans. Conclusion: The most common organism isolated from blood culture was Klebsiella (36.9%). Further detailed studies are recommended to better understand the risk factors and to develop the management methods.

Keywords---Neonatal sepsis, Gram negative bacteria, Diagnosis, Pregnancy.

Introduction

Adequate care has to be taken to the new born child because there is large number of mortality in the age group of less than 5 [1]. Further most prevalent group is babies within day zero to day 28 after birth [2]. The prevalence of neonatal sepsis reported by the NNPD analysis is thirty out of thousand new born babies [3].To reduce these deaths, WHO has issued guidelines that comprises of breastfeeding, cord care, eye care, thermoregulation, management of asphyxia, recognition of danger signs, immunization and care of the low birth weight infant [4]. However, to accomplish these guidelines not only health care workers but also the mothers should cooperate for adequate care to the new born child. As the neonatal sepsis is the second to premature deaths, there is a strong need to consider this as an emergency health issue and resolve it effectively. For this, it is essential to understand the risk factors associated with the neonatal sepsis. This will help to plan most effective treatment strategies [5]. Hence, the present study was undertaken to observe the risk factor analysis for neonatal sepsis and the outcome in tertiary care neonatal nursery

Aim and Objectives

The present study was undertaken to observe the risk factor analysis for neonatal sepsis and the outcome in tertiary care neonatal nursery.

Material and Methods

Study design: Cross-sectional study

Study setting: In-patient wards, Department of Pediatrics, GEMS Medical College, Andhra Pradesh, India.

Study participants: New born babies with standard signs and symptoms of sepsis were part of the study after obtaining consent from their parents. The study was conducted between April 2019 to June 2020. The following criteria were used in recruiting the participants.

Inclusion criteria:
Newborns admitted with sepsis screen positive were recruited in the study.

Tools: Venous blood was drawn from the newborn babies after proper consent from parents and assessed for sepsis. Those positive were recruited in the study. These newborn babies were managed as per the hospital protocol and a predesigned and standard questionnaire was used to collect the data about the risk factors.

Ethical considerations: The present study protocol was approved by the institutional human ethical committee. Confidentiality of the data was maintained as per the ICMR guidelines.

Statistical Analysis: Data was analyzed using SPSS 23.0 version. Descriptive statistics was used to present the data.

Results

Out of the recruited new born babies, 49% were females and 51% were males. Table 1 presents the intra and extra mural cases details of participants. Mothers of 522(62%) neonates were primi gravida. Mothers of 24.3%(202) neonates were 2nd gravid. Table-3: presents natal Risk Factors in Intramural Sepsis.

Table 1: Intra and extra mural cases details of participants

		Total (957)	EOS	LOS	Recovery	Death	Culture proven sepsis	Death in culture provensepsis
Intra Mural	Number		743	102	804	41	72	8
	Percentage	845	88	12	95	5	9	11
Extra Mural	Number		57	55	108	4	29	2
	Percentage	112	50.8	49.2	96.4	3.6	25.5	8

Table-2: Maternal Risk Factors in Intramural Sepsis

MATERNAL RISKFACTORS	NUMBER(n=845)	PERCENT (%)
HEMOGLOBIN		
>10 gm/dl	450	53.3
8 to 10 gm/dl	313	37
<8 gm/dl	82	9.7
PIH		
YES	149	17.6
NO	696	82.4
GDM		
YES	128	15
NO	717	85
MATERNAL FEVER WITHIN 2 WEEKS PRIOR TO DELIVERY		
YES	98	11.6
NO	747	88.4
QUANTITY OF LIQUOR		
NORMAL	664	78.6
OLIGO HYDRAMINOS	132	15.6
POLY HYDRAMINOS	49	5.8
H/O UTI		
YES	54	6.4
NO	791	93.6

Table-3: Natal Risk Factors in Intramural Sepsis

NATAL RISK FACTORS	NUMBER (n=845)	PERCENT (%)
PLACE OF DELIVERY		
HOME/ TRANSIT	13	1.5
PHC/GH	20	2.4
TERTIARY CARE	812	96.1
PRIVATE HOSPITAL	0	0
MODE OF ONSET OF LABOUR		
SPONTANEOUS	683	80.8
INDUCED	142	16.8
MEMBRANES RUPTURED OUTSIDE		
YES	210	24.9
NO	635	75.1
PROLONGED RUPTURE OF MEMBRANES		
YES	107	12.7
NO	738	87.8
MODE OF DELIVERY		
NVD	455	53.8
AVD	107	12.7
ELECTIVE LSCS	20	2.4
EMERGENCY LSCS	263	31.1
LIQUOR		
NORMAL	706	83.6
BLOOD STAINED	7	15.6
MECONIUM STAINED	132	0.8

The most common organism isolated from blood culture was Klebsiella(36.9%). Other organisms isolated were Acinetobacter, Pseudomonas, E.coli, Staphylococcus aureus, Proteus and Citrobacter. 2. 1% had culture positive for Non Candida albicans.

Discussion

The present study was undertaken to observe the risk factor analysis for neonatal sepsis and the outcome in tertiary care neonatal nursery. Out of the recruited new born babies, 49% were females and 51% were males. Table 1 presents the intra and extra mural cases details of participants. Mothers of 522(62%) neonates were primi gravida. Mothers of 24.3% (202) neonates were 2nd gravid. Table-3: presents natal Risk Factors in Intramural Sepsis. The most common organism isolated from blood culture was Klebsiella (36.9%). Other organisms isolated were Acinetobacter, Pseudomonas, E.coli, Staphylococcus aureus, Proteus and Citrobacter. 1% had culture positive for Non Candida albicans.

Neonatal mortality is a global issue and has to be addressed [6] Due to increase in the deaths of the newborns there is a strong need to develop guidelines to save the lives of these newborns [7-9]. Keeping this in mind WHO issued guidelines to be followed [10]. Despite these guidelines, there is higher mortality rate in the

developed and developing countries [11-15]. Hence, there is a strong need to evaluate the risk factors for the neonatal sepsis. Earlier studies reported that mainly gram negative organisms are the reason for development of sepsis [16-20]. The present study agrees with earlier studies as we have observed similar results in our study.

Conclusion

The most common organism isolated from blood culture was Klebsiella (36.9%). Other organisms isolated were Acinetobacter, Pseudomonas, E.coli, Staphylococcus aureus, Proteus and Citrobacter. 1% had culture positive for Non Candida albicans. Further detailed studies are recommended to better understand the risk factors and to develop the management methods.

Conflicts of interest: none declared

Source of funding: Nil

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