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Study of Endo tracheal Tube Culture in Ventilated Infants and its Role in Diagnosis of Sepsis in a Level III NICU

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I. Introduction

Neonatal Sepsis remains a major cause of morbidity and mortality in newborn . It “may be categorized as early-onset or late-onset. Of newborns with early-onset sepsis, 85% present within 24 hours, 5% present at 24-48 hours, and a smaller percentage present within 48-72 hours”.Premature neonates have a more swift onset. Risk of infection is directly related to Maternal, Neonatal and environmental factors, and adverse outcome can be prevented by early neonatal evaluation and therapy.[1]. Neonatal sepsis in India is very high 30/1000 live birth, rural 49 to 170/1000 (NNF perinatal database 2002 -2003), themortality rateis very high 28 (WHO, UNICEF 2015).

Late onset sepsis occur from 4-90 days of lifeand is acquired from the caregiving environment. In Late-onset sepsis shows a higher rate of coagulase-negative streptococcal sepsis;. The infant’s respiratory tract, skin, conjunctivae, gastrointestinaltract and umbilicus may become colonized from the environment , These colonized organism lead to possibility of late-onset sepsis. Vectors for such colonization may include intravascular or urinary catheters, other indwelling lines, or contact with caregivers who have bacterial colonization. Meningitis and bacteremia are the commonest manifestation oflate-onset sepsis whereas pneumonia in early-onset sepsis. Ill infants and preterm are more susceptible to sepsis,havingatypical initial presentations; strict caution is necessary in these neonates so that sepsis can be effectively managed. As neonates have relative immunosuppression,therefore treatment with appropriate antibiotics should be started as soon as sepsis is suspected. [3]

Group B streptococcus and E coli were in trend during 1990 in neonatalsepsis , nowS epidermidis is commonly detected . Microorganism like “ *L monocytogenes, C pneumoniae, Hemophillusinfluenza,Enterobacteraerogenes,* and species of *Bacteroides* and *Clostridium* have also recognizedin neonatal sepsis. someinfections with entero-virus, adenovirus, cox-sackievirus may be responsible forMeningo-encephalitis and neonatal sepsis. Some “STD (gonorrhea, syphilis, HSV infection, cytomegalovirus infection, hepatitis, human immunodeficiency virus infection, rubella, toxoplasmosis, trichomoniasis, and candidiasis) have all been involved”. Resistance to antibiotics is also a emerging cumbersome problem in managing neonatal sepsis..[4]

Chances of early-onset neonatal sepsis increases with prematurity, immunologic immaturity, maternal GBS colonization, PROM , and maternal intra-amniotic infection. Use of intrapartum antibiotics to Group B streptococcus colonized females has markedly decreased the chances of early onset sepsis in neonates. Studies have revealed Gram-negative microorganism as commonest infective agent on early-onset sepsis. Late-onset neonatal sepsis involves both Gram-positive organisms, including *Staphylococci* and *S aureus*,as well as gram negative organisms . Invasive candidiasis is an emerging cause of late-onset sepsis, especially among infants who have receive broad spectrum antimicrobial agents. Restricted steroid use,early enteral feeding, cautious use of invasive device are important cost effective factorsin decreasing load of late onset sepsis. [5]

Hospital acquired infections are the commonest complications faced in the neonatal intensive care unitwhich result in increased duration of hospitalization in the survived neonates, which in turn increases cost of maintaining care. Routine E T Tube culture is not a part of sepsis screening but if blood culture is sterile then ET Tube culture can play a important role. [6]

Complication associated with neonatal sepsis in term infants can be countered with early diagnosis and treatment, however early signs or risk factors of neonatal sepsis are important if fail to catch can result in higher chances of morbidity and mortality.Approx. 15-30% of neonates with septic meningitis shows residual neurologic damage .Untreated neonates suffering from sepsis have 50% higher chances of mortality during the first month of life, this period is critical as it contributes 14-16% of all neonatal mortality. Gram-negative infection andLow birth weightareoftenlyassociated with poor results . [7]

2-4 cases of neonatal meningitis per 10,000 live births have been recorded and found to besignificant in termmortality associated withneonatal sepsis and also responsible for 4% ofoverall neonatal mortality. Preterm infants who have had sepsis, hindered neurological development is a point to watch for.[8]

Proinflammatory molecules probablyaffects the brain growth negatively in this particularpopulation.A large study of approx.six thousand premature infants,weighed less than 1kg at birth concluded thathigh chances of cognitive deficits, cerebral palsy, andneurodevelopmental disabilities found in preterm infants with sepsis with no meningitisthan infants who did not have sepsis. “Periventricular leukomalacia and hydrocephalus may be seen in infants with meningitis andwith use of aminoglycosides, hearing impairment or nephrotoxicity”. [9, 10]

Laboratory test include a complete blood count and differential, C-reactive protein blood and cerebrospinal fluid (CSF) cultures,andother infection markers for early-onset and late-onset sepsis.For early detection ofgram-positiveand gram-negative nature of microorganism , gram stain should also be obtain. For early detection of sepsis and the causative microorganismother than blood culture, newer technology like polymerase chain reaction can also be used. [11]

Incidenceof meningitis is less in the neonates with negative blood culture, thus CSFculture should be encouraged in infants either documented or likely sepsis. However several other studiesshow “a 38% rate of culture-positive meningitis with negative blood culture in neonates with suspected sepsis. L P should be done for assessment of neonate with suspected sepsis”. Rapid and early pathogen identification using multiplex Polymerase Chain Reaction may provideprompt selection of appropriate antibiotics. In the workup of neonatal sepsis Imaging studieslike ultrasonography computed tomography, magnetic resonance imaging of the head and chest radiography to evaluate pulmonary involvement.[12]

At present one of the most common complications in the neonatal care units are hospital acquired infections.Preterm and LBW babies are more prone for hospital acquired infections.Hospital acquired infection manifest after 48 hrs of admission. Mechanically ventilated neonates are at particular risk ofalternate route of entry for pathogens because artificial airway skip the body’s natural defense mechanism..Intubation associated lesions of pharynx and trachea lead to bacterial colonization by deterioration of swallowing reflex and cilliary function. So in the downstream effects subsequently these babies develop pneumonia and sepsis.[13]

In the above scenario, this study wasintend to assess the pattern of respiratory tract colonization in infants and value of culture of E T tube aspirate in predicting causative agents of sepsis.

II. Aims and Objectives

1. To identify common pathogens occurring in the NICU in intubated babies .
2. To identify the type of organism in relation to mechanical ventilation .
3. To identify the organism and their sensitivity pattern, to relate endotracheal tube infection with ongoing infection control report of hospital.
4. To compare the other sepsis indicators like CRP, micro ESR, CBC, PBF.
5. To look for outcome of treatment .

III. Material and Methods

Study Type:
This will be an observational, prospective study.

Study Period:
1yr

Sample size:
Any ventilated babies during study period
Resident of Neonatology will attend all babies delivered in this hospital and the following details will be noted;

1. Name and Age of mother
2. Name and Age of father
3. Address
4. Occupation
5. Income per year

Following details of labour are taken

1. Date of delivery
2. Time of delivery
3. Nature of delivery
4. Perinatal history
5. Family history

Then examination of baby is done
1. APGAR SCORE
2. Gestation assessment
3. Anthropometry

Various blood investigation and endotracheal tube will be send for gram stain, culture and sensitivity

Inclusion criteria:
1. Any baby found having respiratory distress due to any cause except surgical cause.
2. Whenever the faculty decides to ventilate a baby.

Exclusion criteria:
1. Neonate before 3 days of life
2. Neonates ventilated for proved lung infections or surgical problems
3. Death before 3 days of ventilation or early improvements
4. Babies testing positive for sepsis at time of endotracheal tube insertion

After the babies were taken on ventilator support they were daily observed for any signs of distress, their vital like respiratory rate, heart rate, blood pressure, capillary filling time and temperature were noted hourly, input output and color of skin were charted, any signsof ET tubal blockage were noticed.

Arterial blood gas analysisand routine investigations were sent and fluid,antibiotic and other requirement fulfilled.

Duringchangeof ET tube, a sterile work area was prepared next to each infant. It include a sterile kidney tray, sterile blade, gloves and I culture vial.

Sample collected from distal end of each ET tube was immediately sent to microbiology lab under all aseptic condition.

In microbiology lab distal cut end was divided into 2 parts under all aseptic condition.

The first part of specimen was send for Gram stain .the second part of deposit was send for bactec culture.

IV. Observation and Results

Statistical analysis

The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using SPSS version 20 (IBM SPSS Statistics Inc., Chicago, Illinois, USA) Windows software program. The variables were assessed for normality using the Kolmogorov Smirnov test.Descriptive statistics included computation of percentages, means and standard deviations. The analysis of variance (ANOVA) [for quantitative data within three groups] was used for comparison of all clinical indicators.Level of significance was set at $P \leq 0.05$.

Table-1: Descriptive data of socioeconomic status

	Frequency	**Percent**
L	20	33.3
LM	4	6.7
U	9	15.0
UL	19	31.7
UM	8	13.3
Total	60	100.0

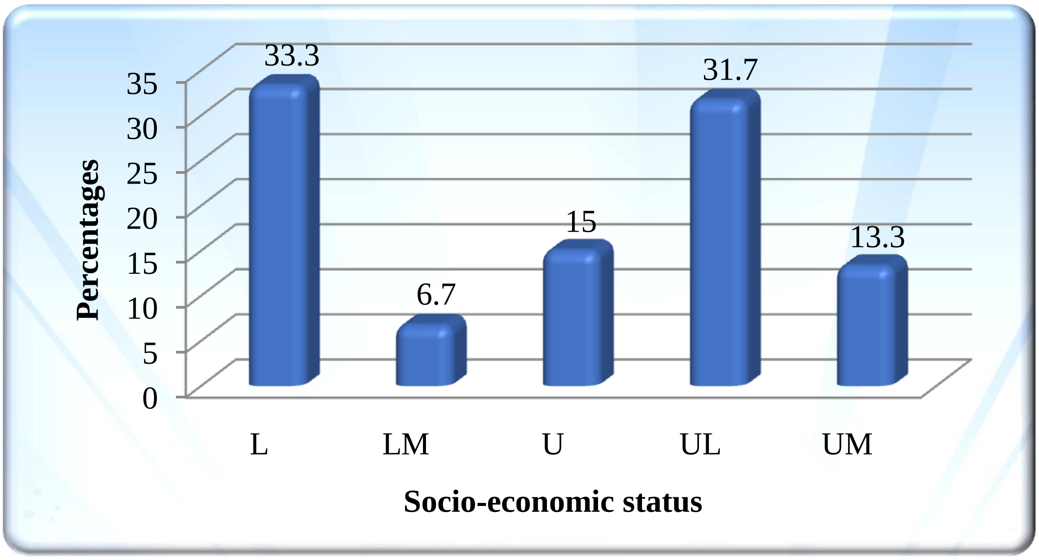


Table-2: Comparison of blood culture with blood reports

		N	**Mean**	**SD**	**F**	**P value**
Toal leucocyte count	Sterile	45	10828.46	2097.51	4.84	0.001 (S)
	Acinetobacterspp	3	9594.33	1099.68		
	Staphylococcus aureus	4	15345.25	3574.17		
	Klebseillapneumoniae	6	13525.33	2678.96		
	Enterococci	1	12654.00	.		
	E coli	1	8946.00	.		
	Total	60	11336.61	2575.64		
Urea	Sterile	45	13.46	4.39	0.96	0.44
	Acinetobacterspp	3	17.1	2.53		
	Staphylococcus aureus	4	13.72	3.16		
	Klebseillapneumoniae	6	16.68	6.42		
	Enterococci	1	13.00	.		
	E coli	1	10.50	.		
	Total	60	13.92	4.508		
Creatinine	Sterile	45	0.0607	0.02	0.62	0.68
	Acinetobacterspp	3	0.08	0.02		
	Staphylococcus aureus	4	0.067	0.02		
	Klebseillapneumoniae	6	0.066	0.02		
	Enterococci	1	0.05	.		
	E coli	1	0.06	.		
	Total	60	0.06	0.02		
Hb	Sterile	45	12.04	1.74	0.47	0.79
	Acinetobacterspp	3	11.56	1.36		
	Staphylococcus aureus	4	11.3	1.43		
	Klebseillapneumoniae	6	11.75	1.65		
	Enterococci	1	10.00	.		
	E coli	1	12.6	.		
	Total	60	11.91	1.67		
CRP	Sterile	45	11.0	5.506	4.96	0.001 (S)
	Acinetobacterspp	3	14.66	3.055		
	Staphylococcus aureus	4	24.75	10.21		
	Klebseillapneumoniae	6	15.16	3.25		
	Enterococci	1	11.00	.		
	E coli	1	18.00	.		
	Total	60	12.63	6.51		

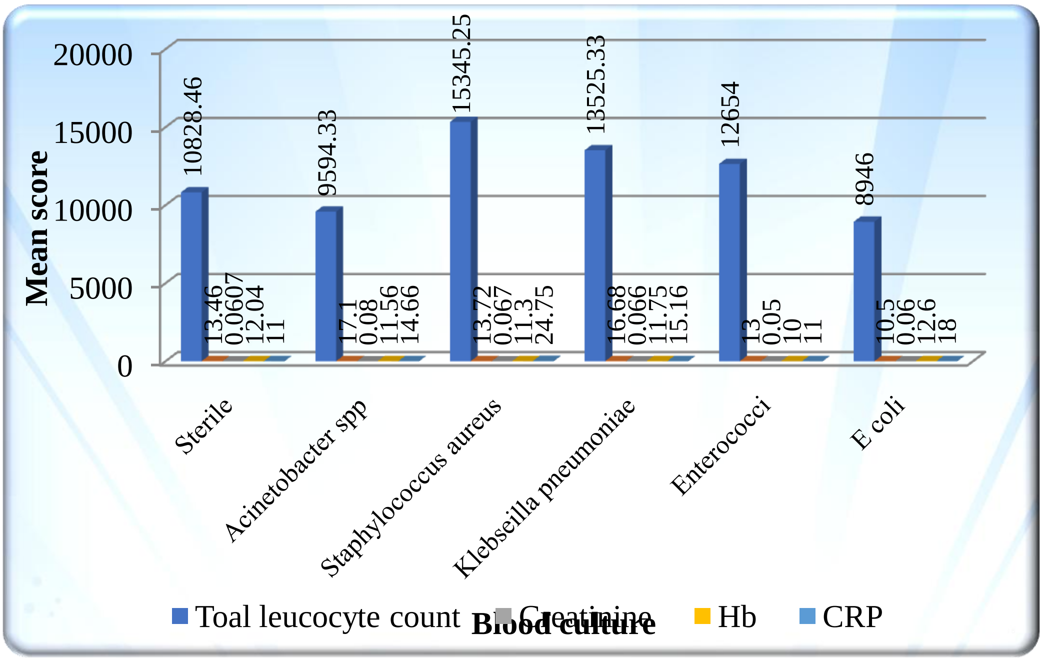


Table-3: Comparison of endotrecheal tube culture with body reports

		N	Mean	SD	F	P value
Toal leucocyte count	Sterile	37	11132.45	2553.08	0.87	0.52
	Acinetobacterspp	4	12645.5	2790.09		
	Staphylococcus aureus	3	9947.0	904.79		
	Klebseillapneumoniae	8	11344.75	2429.806		
	Serratiamarcescens	2	10275.5	607.404		
	Mixed growth	5	13226.4	3706.25		
	Streptococcuspyogenes	1	10432.00	.		
	Total	60	11336.61	2575.64		
Urea	Sterile	37	14.48	4.86	1.34	0.25
	Acinetobacterspp	4	10.9	1.82		
	Staphylococcus aureus	3	14.03	3.35		
	Klebseillapneumoniae	8	11.01	3.81		
	Serratiamarcescens	2	13.4	3.11		
	Mixed growth	5	16.24	3.38		
	Streptococcuspyogenes	1	17.8	.		
	Total	60	13.92	4.508		
Creatinine	Sterile	37	0.06	0.022	0.75	0.61
	Acinetobacterspp	4	0.05	0.011		
	Staphylococcus aureus	3	0.076	0.02		
	Klebseillapneumoniae	8	0.05	0.022		
	Serratiamarcescens	2	0.06	0.007		
	Mixed growth	5	0.07	0.02		
	Streptococcuspyogenes	1	0.07	.		
	Total	60	0.06	0.02		
Hb	Sterile	37	11.72	1.78	0.57	0.74
	Acinetobacterspp	4	11.62	1.26		
	Staphylococcus aureus	3	11.4	2.28		
	Klebseillapneumoniae	8	12.65	1.46		
	Serratiamarcescens	2	13.15	0.35		
	Mixed growth	5	12.1	1.52		
	Streptococcuspyogenes	1	12.3000	.		
	Total	60	11.91	1.67		
CRP	Sterile	37	9.97	4.45	6.17	0.001 (S)
	Acinetobacterspp	4	11.00	0.81		
	Staphylococcus aureus	3	21.33	5.77		
	Klebseillapneumoniae	8	15.5	5.55		
	Serratiamarcescens	2	16.00	1.41		
	Mixed growth	5	22.00	10.88		
	Streptococcuspyogenes	1	15.00	.		
	Total	60	12.63	6.51		

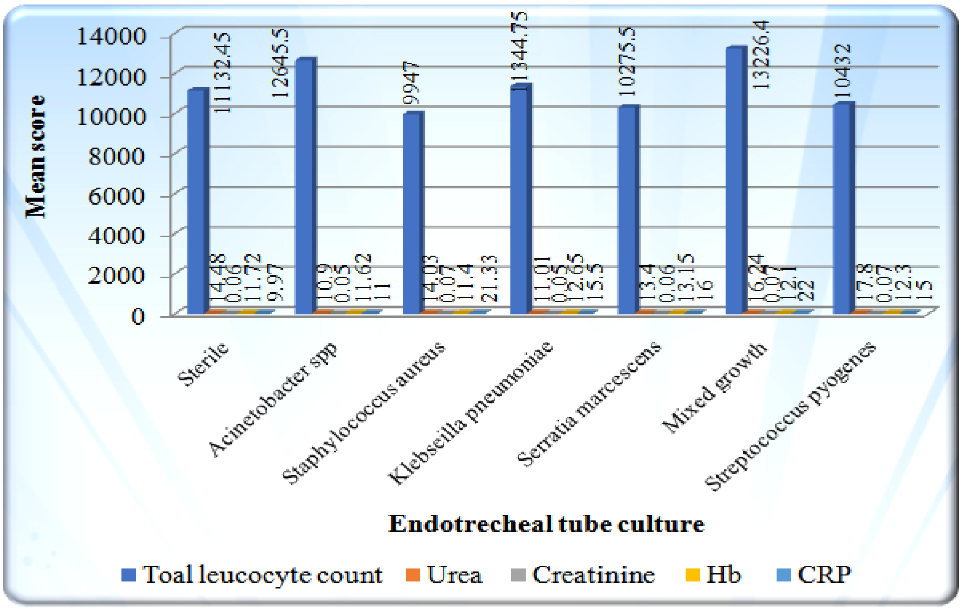


Table-4: Comparison of gestational age and gender

		Gender		Total	P value
		F	M		
LPT	N	2	3	5	0.98
	%	40.0%	60.0%	100.0%	
PST	N	1	2	3	
	%	33.3%	66.7%	100.0%	
PT	N	1	2	3	
	%	33.3%	66.7%	100.0%	
T	N	20	29	49	
	%	40.8%	59.2%	100.0%	
	N	24	36	60	
	%	40.0%	60.0%	100.0%	

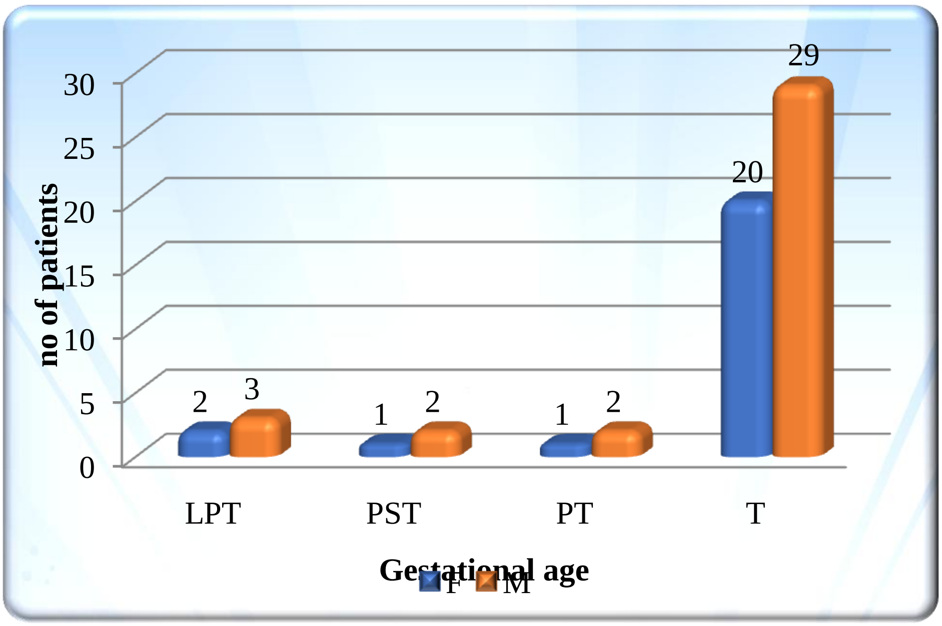


Table-5: Comparison of gestational age and blood culture

		gestational age				Total	
		LPT	PST	PT	T		P value
Acinetobacterspp	N	0	0	0	3	3	0.106
	%	0.0%	0.0%	0.0%	100.0%	100.0%	
E.coli	N	0	0	0	1	1	
	%	0.0%	0.0%	0.0%	100.0%	100.0%	
Enterococci	N	0	0	0	1	1	
	%	0.0%	0.0%	0.0%	100.0%	100.0%	
Klebseillapneumoniae	N	0	0	2	4	6	
	%	0.0%	0.0%	33.3%	66.7%	100.0%	
Staphylocoocusaureus	N	2	0	0	2	4	
	%	50.0%	0.0%	0.0%	50.0%	100.0%	
Sterile	N	3	3	1	38	45	
	%	6.7%	6.7%	2.2%	84.4%	100.0%	
Total	N	5	3	3	49	60	
	%	8.3%	5.0%	5.0%	81.7%	100.0%	

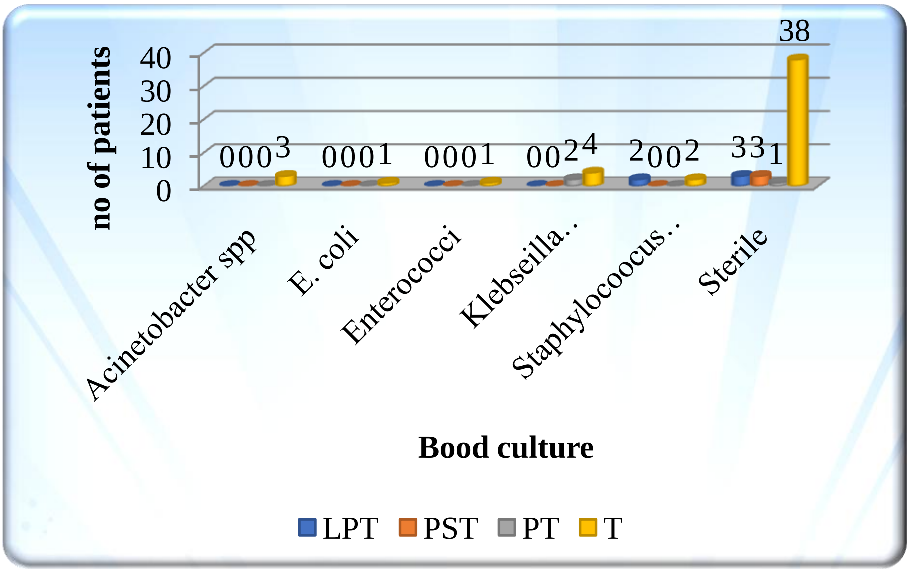


Table-6: comparison of gestational age and endotrecheal tube culture

		Gestational age				Total	P value
		LPT	PST	PT	T		
Acinetobacterspp	N	0	0	0	4	4	0.03 (S)
	%	0.0%	0.0%	0.0%	100.0%	100.0%	
Klebseillapneumoniae	N	0	0	0	8	8	
	%	0.0%	0.0%	0.0%	100.0%	100.0%	
mixed growth	N	2	0	0	3	5	
	%	40.0%	0.0%	0.0%	60.0%	100.0%	
serratiamarcescens	N	0	0	0	2	2	
	%	0.0%	0.0%	0.0%	100.0%	100.0%	
staphylococcusaureus	N	0	0	0	3	3	
	%	0.0%	0.0%	0.0%	100.0%	100.0%	
sterile	N	3	2	3	29	37	
	%	8.1%	5.4%	8.1%	78.4%	100.0%	
streptococcuspyogenes	N	0	1	0	0	1	
	%	0.0%	100.0%	0.0%	0.0%	100.0%	
Total	N	5	3	3	49	60	
	%	8.3%	5.0%	5.0%	81.7%	100.0%	

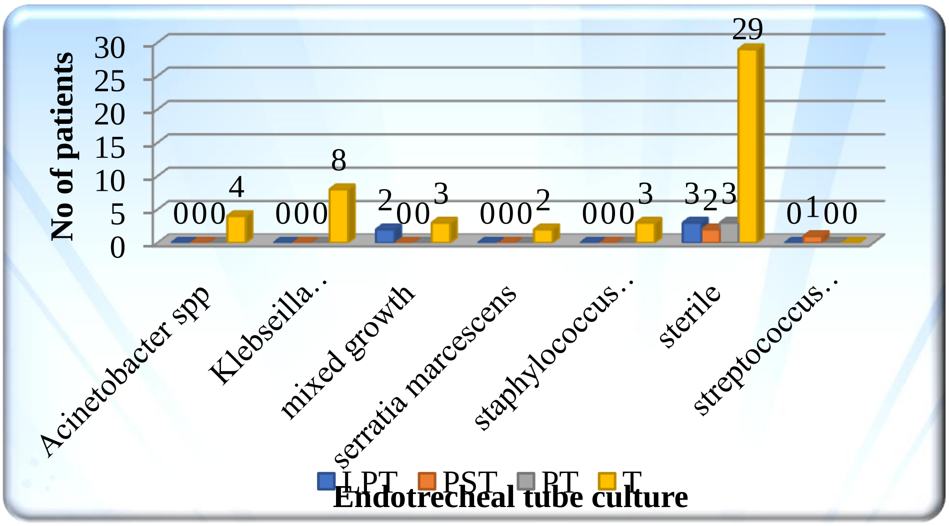


Table-7: Comparison of cultures

		Endotrecheal tube culture							
		Sterile	Acinetobacterspp	taphylococcusaureus	Klebseillapneumoniae	erratiamarcescens	mixed growth	treptococcupyogenes	Total
Blood culture	Sterile	28	3	3	7	1	2	1	45
	Acinetobacterspp	2	0	0	1	0	0	0	3
	Staphylococcusaureus	1	0	0	0	1	2	0	4
	Klebseillapneumoniae	4	1	0	0	0	1	0	6
	E.coli	1	0	0	0	0	0	0	1
	Enterococci	1	0	0	0	0	0	0	1
Total		37	4	3	8	2	5	1	60

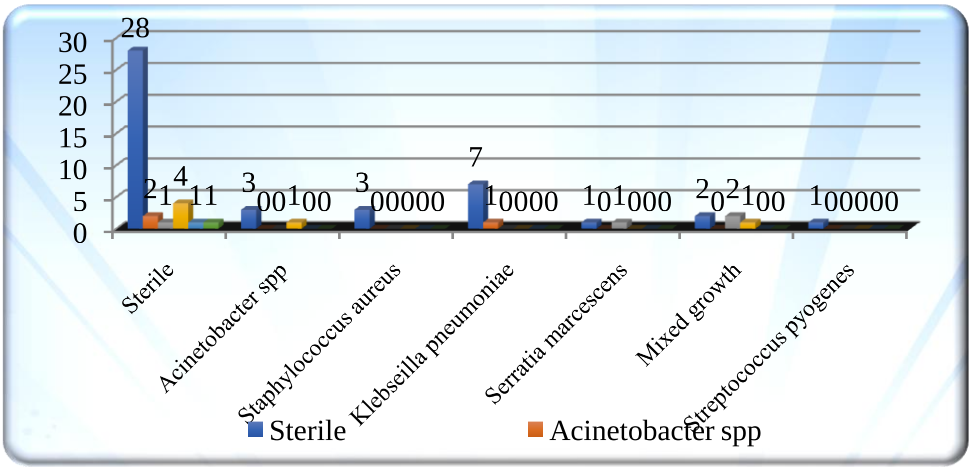


Table-8: Descriptive data of blood culture

	N	**%**
Sterile	45	75
Acinetobacterspp	3	5
Staphylocoocusaureus	4	6.6
Klebseillapneumoniae	6	10
E.coli	1	1.7
Enterococci	1	1.7
Total	60	100

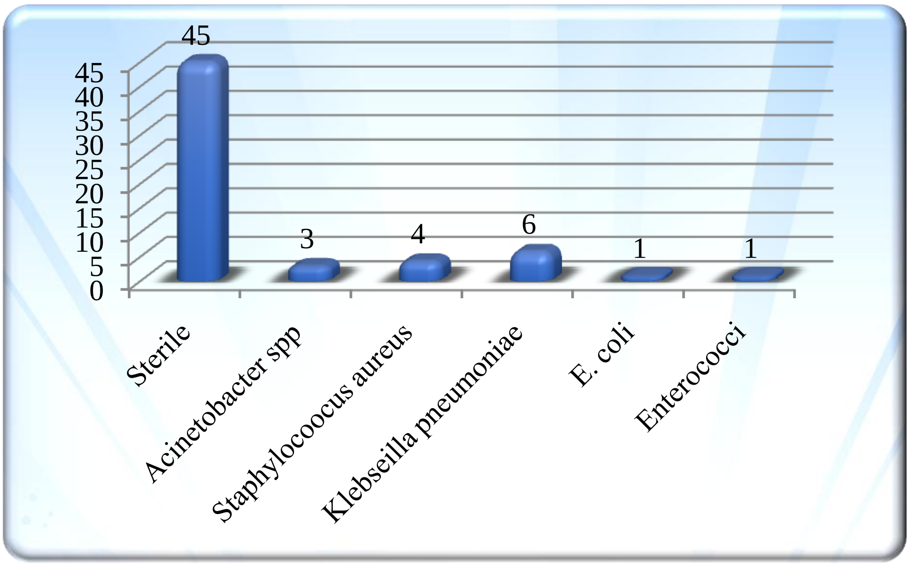
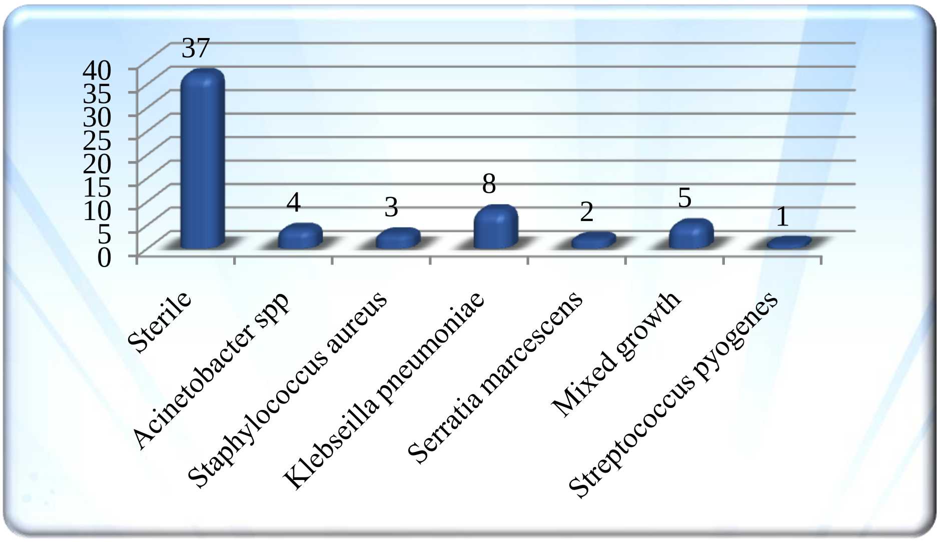


Table-9: Descriptive data of endotrecheal tube culture

	N	%
Sterile	37	61.7
Acinetobacterspp	4	6.7
Staphylococcus aureus	3	5
Klebseillapneumoniae	8	13.3
Serratiamarcescens	2	3.33
Mixed growth	5	8.33
Streptococcuspyogenes	1	1.7
Total	60	100



V. Discussion

Neonatal Intensive Care Unit (NICU) faces sepsis as a common complication.The incidence of neonatal sepsis is 1-5per 1,000 live births, and its mortality rate is 5%-20%.

In the neonatal intensive care unithospital acquired infections (nosocomial infections) are the most common complications encountered. They generally manifest 48 hours after hospitalization or in 48 hours after discharge, Preterm and low birth weight newborns are more vulnerable (20 to 33%) to nosocomial infections.

Babieson mechanical ventilation face a particular risk as artificial airways bypass the body's defense against inhaled pathogens and offer new routes for non airborne pathogens. Deterioration of the swallowing reflex and the ciliary functions is often because of intubation associated lesions of the pharynx and trachea which lead to bacterial colonization. Subsequently, these babies may developsepsis andpneumonia.

Empirical antibiotics are administered in NICU depending on positive blood picture report or if the child is delivered outside and much intervention has been done on him. Target antibiotics are started if culture are positive (blood, urine, CSFendotrachealtube).

In this study, blood culture wassterile in 45 (75%). Klebsiella was the most commonly detected organism (10%), followed by Staph. Aureus(6.6%) and acinobacter spp. was detected in (5%) of cases. Enterococci and E coli were equally detected in (1.6%) of cases each.

In this study, endotrecheal tube culture was sterile in 37 (61.6%). Klebsiella was the most commonly detected organism (13.3%), followed by mixed growth (8.3%), acinetobacter spp. (6.6%) ,Staph. Aureus(5%) were detected, serratiamarcescens were were equally detected in (3.33%) of cases and Streptopyogenes was found only 1.66%of cases each.

This comes in agreement with the study of dzwonek (2008) et al in which nearly half of the positive blood cultures grew Klebsiellapneumoniae. Also, the study done by De Benedetti (2007)revealed that the isolated pathogens included Klebsiellapneumoniae (47.5%), Pseudomonas aeruginosa (20%), E.coli (10%), Candida albicans (10%), Staphylococcus aureus (>7.5%), and En-terococcus (5%).

Our results are in disagreement with a retro-spective study done by Shaw M.J (2005)who studied the prevalence of different organisms causing septicemia and the antibiotic susceptibility pattern. The most common organisms isolated were Staphylococcus aureus (42.75%) followed by Klebsiella (18.32%), E.coli (12.21%), Pseudomonas aeruginosa (6.11%); also Enterobacter spp. was isolated in (9.23%), Acinetoobacter (4.62%), Streptococcal spp. In (7.69%) and Neisseria gonorrhea in (1.54%).

In present study, 45.8% subjects have same sterile cases in both blood and endotrecheal tube culture. BozaykutA (2008)et alfound that blood and endotracheal cultures showed the same organisms only in 17.6% of the patients. There was no relationship among 86.4% of the patients. The rate of culture positivity increased as the birth weight decreased, gestation week got smaller and the duration of intubation got prolonged.

Mohamed LH (2014)[1] et al was reported that 26 cases (43.3%o) showed +ve early endotracheal tube culture (performed on day 3), while 34 cases (56.7%o) showed –ve early ETT culture. Among the culture +ve cases, again Klebsiella was the most commonly detected organism (69.23%). 16 cases (26.7%) showed +ve late endotracheal tube culture, while 44 cases (73.3%) showed –ve late ETT culture. Among the culture +ve cases, Klebsiella also was the most commonly detected organism (62.5%) followed by Strept. Viridians, Staph.Coagluase, which were detected in (12.5%), while Staph. Aureus andPsendomans,were each detected in (6.25%) of cases.

In our study, there were no statistically significant differences between body weight (BW) andblood culture and endotracheal tube culture. Mean score of birth weight of babieswas 2.71 gm. This is in discordance with Belling LL (2004)who found that the incidence of sepsis is significantly higher in infants with very low birth weight (<1000g), at 26per 1000 live birth, than in infants with birth weight of 1000- 2000g, at 8-9per 1000 live birth.

In our study, there was statistically significant difference found between blood reports (CRP) andblood and endotrecheal tube culture both while total leucocyte count was only significant with blood culture. Urea, creatinine and Hb were not showed significant results with both cultures.

Blood culture is the gold standard method for isolation of the organisms; blood culture should be obtained before the initiation of antibiotics.

VI. Summary

In this study, blood culture yielded sterile cases were 45 (75%). Klebsiella was the most commonly detected organism (10%), followed by Staph. Aureus(6.6%) and acinobacter spp. was detected in (5%) of cases. Enterococci and e-coli were equally detected in (1.6%) of cases each.

In this study, endotracheal tubeculture yielded sterile cases were 37 (61.6%). Klebsiella was the most commonly detected organism (13.3%), followed by mixed growth (8.3%), acinobacter spp. (6.6%) and Staph. Aureus(5%) were detected. and serratiamarcescens were were equally detected in (3.33%) of cases each.Streptopyogenes found only 1.66%of cases each.

In present study, 45.8% subjects have same sterile cases in both blood and endotracheal tube culture.

VII. Conclusion

In our study we found that organism whichwere grown in endotracheal tube culture were not the same as in blood culture.

- Change of antibiotic in relation with Endo tracheal tube culture is oflittle use.
- Blood culture remain the gold standard for diagnosis ofneonatal sepsis.
- Practice of endotracheal aspirate and cultures is an expensive proposition with low yield.

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VIII Master-Chart

Sl.	Name	Ip. No	Sex	Gestational Age	Father Education	Father Occupation	Mother Education	Mother Occupation	Type Of Family	Type Of House	Family Income	Socioeconomic Status	Apgar Score 1minute	Apgar Score 5 Minute	Weight	Length	Head Cicumference	Chest Circumference	Total Leucocyte Count	Urea	Creatinine	Na	K	Cl	Hb	Crp	Investigations: Blood Culture And Sensitivity	Investigations: Endotracheal Tube Culture & Sensitivity
1	B/O Chanda		M		P	SW	P	H	J	R	7594-11361	L	3	8	3	47	34	31	13500	11.2	0.04	140	6.2	101	14	22	sterile	sterile
2	B/O Mosami		F		G	SW	G	SW	J	R	4556-7593	LM	4	8	2.8	45	33	30	12430	8.6	0.06	142	5.3	102	10.3	11	sterile	acinobacter spp.
3	B/O Archana	16-17043	M		G	O	G	SW	J	O	>30375	U	2	5	2.5	45	33	30	9850	13	0.08	139	5	109	12.5	4	sterile	sterile
4	B/0 Parth	16-19592	F		G	SP	G	P	J	O	>30375	U	3	6	3.2	44.5	34	31	10890	10.4	0.1	134	4.8	100	9.7	28	sterile	staphylococcusaureus
5	B/O Kamlesh	16-18520	F		P	P	P	P	J	O	15188-30374	U	5	8	2.7	45	32.5	30.5	8943	16	0.05	138	5.2	104	12.2	18	acinetobacterspp	sterile
6	B/O Anokhi	16-19502	M		PG	P	PG	P	N	R	15188-30374	U	4	7	3	46	33.5	31	9678	9	0.04	130	6.6	99	10.6	7	sterile	sterile
7	B/O Pooja	16-8654	M		HS	SO	HS	SO	J	R	11362-15187	UL	4	9	2.9	46	34	29	11758	7.8	0.04	138	4.1	118	14	8	sterile	Klebseillapneumoniae
8	B/O Santra	16-12357	F		G	SP	G	P	N	O	11362-15187	UM	3	6	2.7	45	33	30	8956	12.4	0.07	135	5.1	119	13.3	6	sterile	sterile
9	B/O Suman	16-11272	M		G	P	G	SO	J	O	>30375	UM	2	5	2.5	44	33.5	29.4	10705	11.2	0.06	130	3.9	110	13.4	17	staphylocoocusaureus	serratiamarcescens
10	B/O Tulsa	16-11915	F		PG	SP	PG	H	J	O	>30375	UM	3	8	3	46.5	34	30	9940	9	0.05	129	4.6	90	12.6	8	sterile	sterile
11	B/O Rukma	16-11567	M		PG	SO	PG	P	N	O	>30375	U	4	7	2.5	45.5	33.5	28.5	14478	18.2	0.1	135	3.8	106	10.6	32	staphylocoocusaureus	mixed growth
12	B/O Heena	16-10495	M		PG	SP	PG	P	N	O	>11362-15187	UM	3	5	3.3	46	34	32	12875	15.3	0.07	126	4.3	103	13.6	9	sterile	sterile
13	B/O Anita	16-14395	F		G	SW	HS	H	N	R	1521-4555	UL	5	9	2.8	47	33	30	8866	10.6	0.05	140	4	116	13	14	sterile	klebseillapneumoniae.
14	B/O Seema	16-16219	F		HS	UW	HS	SSW	N	O	7594-11361	L	3	6	2.6	44	33.5	31	8850	7	0.04	143	6.2	88	9.4	5	sterile	sterile
15	B/O Shalu	16-16536	M		MS	U	MS	SO	J	R	11362-15187	UL	2	6	2.2	43	32.5	28.5	10458	22	0.09	129	5.4	96	12.8	6	sterile	sterile
16	B/O Megha	16-17095	M		G	SSW	G	H	J	O	4556-7593	UL	3	5	2	42	31.5	28	16320	12.4	0.05	142	5.1	107	10.4	15	klebseillapneumoniae	sterile
17	B/O Jyoti	16-13577	F		G	SW	G	H	J	R	7594-11361	L	3	7	2.6	45	33	28	16504	13	0.06	139	4.8	100	13.2	12	sterile	acinobacter spp.
18	B/O Manju	16-14897	M		G	SW	G	SW	J	R	4556-7593	LM	2	5	3.4	47.5	34	32	10652	9.6	0.04	128	3.6	101	13.7	5	sterile	sterile
19	B/O	16-	F		H	S	H	U	J	R	7594-	U	3	6	1.	42	31	28	14	14	0.	13	5.	93	9.	14	klebseill	sterile

Sl.	Name	Ip. No	Sex	Gestational Age	Father Education	Father Occupation	Mother Education	Mother Occupation	Type Of Family	Type Of House	Family Income	Socioeconomic Status	Apgar Score		Weight	Length	Head Cicumference	Chest Circumference	Total Leucocyte Count	Urea	Creatinine	Na	K	Cl	Hb	Crp	Investigations	
													1minute	5 Minute													Blood Culture And Sensitivity	Endotracheal Tube Culture & Sensitivity
	Roshni	9300			S	O	S	W			11361	L			9			.3	578	.8	05	0	3		7		apneumoniae	
20	B/O Preeti	16-9559	F		G	SP	G	SO	J	O	>30375	U	4	8	2.8	45	34	29	8946	17.5	0.06	134	4.9	103	14.5	17	sterile	mixed growth
21	B/O Mathura	16-9978	M		P	P	P	SO	N	O	15188-30374	U	3	5	2.6	45.5	32	30	10864	20	0.1	131	4	110	12.5	14	acinetobacterspp	Klebseillapneumoniae
22	B/O Rukma	16-11567	M		G	P	G	SO	J	O	>30375	UM	2	6	2.5	46	32.5	29	7850	18	0.09	127	5.3	109	9.4	10	sterile	sterile
23	B/O Manorma	16-28909	M		G	UW	G	SSW	N	O	7594-11361	L	3	9	3.1	47	34	30	9846	15.6	0.07	146	4.1	101	12.9	15	sterile	serratiamarcescens
24	B/O Neetu	16-26928	F		P	SP	P	H	J	O	>30375	UM	4	8	3	46.5	34	32.5	8896	25	0.11	136	5.6	104	9.1	5	sterile	sterile
25	B/O Vishnu	16-26498	M		PG	P	PG	SO	J	R	>30375	UM	3	6	2.6	44.5	33.5	29	9844	10.7	0.04	143	4.1	110	9.9	9	sterile	sterile
26	B/O Komal	16-26540	M		G	SW	G	SO	J	R	1521-4555	L	3	6	2.8	45	33	30	10784	8.9	0.05	139	6	110	13.6	14	sterile	klebseillapneumoniae
27	B/0 Beena	16-26362	F		HS	SO	HS	SO	N	R	11362-15187	UL	2	6	2.4	44	33	29	17438	11.8	0.05	141	5.3	103	10.2	15	staphylocoocusaureus	sterile
28	B/O Indra	16-60153	M		MS	SP	MS	UW	N	R	1521-4555	UL	3	8	3.2	46.5	34.5	32	7890	19	0.07	146	4	104	9.3	11	sterile	sterile
29	B/O Kanchan	16-25315	M		P	UW	P	SSW	N	O	7594-11361	L	2	5	2	44	31.5	28	11243	12.6	0.05	140	4.7	110	13	10	sterile	sterile
30	B/O Sushila	16-25310	F		G	UW	G	SSW	N	O	7594-11361	L	2	7	2.4	45	32.5	28	9865	14.7	0.06	133	5.5	105	10.5	18	sterile	staphylococcusaureus
31	B/O Sangeeta	16-25289	F		HS	U	HS	SO	N	R	11362-15187	UL	4	7	3.4	47.5	34.5	32	13400	17.2	0.07	135	5.2	101	9.4	8	sterile	sterile
32	B/O Guddi	16-20384	M		MS	SW	MS	H	J	R	7594-11361	L	3	8	2.6	45	32.5	30.2	12780	20	0.09	141	4.8	104	12.4	16	klebseillapneumoniae	mixed growth
33	B/O Anokhi	16-19502	F		P	SO	P	H	J	O	4556-7593	UL	3	6	3.6	48.5	34	32	9846	9.7	0.04	136	3.9	105	14	9	sterile	sterile
34	B/O Geeta	16-23856	M		G	SW	G	SW	N	R	4556-7593	L	3	8	2.5	44.5	33	30	11138	11	0.03	130	5.2	102	10.7	10	sterile	sterile
35	B/O Yasoda	16-20249	M		PG	SO	PG	UW	J	R	7594-11361	UL	4	7	2.8	46	33.5	30	10740	8.9	0.05	135	4	101	9.5	16	sterile	klebseillapneumoniae
36	B/O Sanju	16-12968	M		G	SP	G	SO	J	R	1521-4555	L	2	5	2.7	46	33	29.5	8946	10.5	0.06	142	5.5	100	12.6	18	e.coli	sterile
37	B/O Suman	16-11274	F		MS	SP	MS	SSW	N	O	7594-11361	L	3	6	2.4	44.5	32.5	28	12468	12	0.05	138	4.3	110	9.9	7	sterile	sterile
38	B/O Vijaylaxmi	16-45025	M		P	SO	P	SO	N	R	11362-15187	UL	4	7	3.5	49	34.5	32.2	10432	17.8	0.07	139	5.3	99	12.3	15	sterile	streptococcus pyogenes

Sl.	Name	Ip. No	Sex	Gestational Age	Father Education	Father Occupation	Mother Education	Mother Occupation	Type Of Family	Type Of House	Family Income	Socioeconomic Status	Apgar Score 1minute	Apgar Score 5 Minute	Weight	Length	Head Cicumference	Chest Circumference	Total Leucocyte Count	Urea	Creatinine	Na	K	Cl	Hb	Crp	Investigations: Blood Culture And Sensitivity	Investigations: Endotracheal Tube Culture & Sensitivity
39	B/O Sadhna	17-8413	F		PG	U	PG	SO	N	R	11362-15187	UL	2	6	2.3	45	33	28	8790	10.7	0.04	132	3.8	100	13.4	10	sterile	sterile
40	B/O Kaushalya	17-8698	F		G	SO	G	H	J	O	4556-7593	UL	5	7	3	48	34	30.5	16344	28.1	0.11	136	4.3	101	14	20	klebseillapneumoniae	sterile
41	B/O Shehnaz	17-8861	M		P	SO	P	UW	J	R	7594-11361	UL	3	5	2.7	46.5	33.5	29	8890	16	0.09	141	5.4	100	13.7	6	sterile	sterile
42	B/O Lata	17-8389	M		G	SP	G	SO	J	R	1521-4555	L	3	7	2.8	47	34	30	9879	15	0.08	144	4.5	101	9.4	9	sterile	sterile
43	B/O Kesar	16-6237	M		G	SW	G	SW	J	R	4556-7593	LM	5	8	2.6	44	33	29	11768	11.4	0.04	137	4.1	118	12	11	Sterile	Acinetobacter spp , S: CL,ALS , R :LE,CTR,AR
44	B/O Mona	16-41886	F		G	UW	G	SSW	N	O	7594-11361	L	2	6	2.4	44	32	28	7861	12.5	0.05	133	3.9	103	11	8	sterile	sterile
45	B/O Hemlata	17-8389	F		G	U	G	SO	N	R	11362-15187	UL	3	6	2.4	45	32.5	28	10986	15.3	0.07	139	6.2	104	12.3	6	sterile	sterile
46	B/O Sharda	17-8575	M		G	SW	G	H	J	R	7594-11361	L	3	7	2.7	45	33	29	12762	9.8	0.04	143	3.5	111	14	11	sterile	klebseillapneumoniea
47	B/O Suman	17-8669	M		PG	SO	PG	H	J	O	4556-7593	UL	3	8	2.5	46	33.5	30	15754	19	0.08	141	3.8	110	11.8	9	sterile	sterile
48	B/O Chetna	17-9951	M		HS	SW	HS	SW	N	R	4556-7593	L	3	5	2.3	44.5	32	28	18760	13.7	0.06	138	4.6	110	11	35	staphylocoocusaureus	mixed growth
49	B/O Krishna	17-9850	M		MS	SO	MS	UW	J	R	7594-11361	UL	2	7	2.8	47	33.5	29	10785	26	0.11	140	4.3	110	15	8	sterile	sterile
50	B/O Varsha	17-10170	M		I	SP	I	SO	J	R	1521-4555	L	3	8	2.5	45	33	30.4	8976	15.3	0.09	136	5.2	103	10	12	acinetobacterspp	sterile
51	B/O Monika	17-10062	F		PS	P	PS	H	J	R	1520	L	2	6	2.9	46	33	29	16330	10.8	0.08	137	3.3	105	12.6	25	sterile	klebseillapneumoniea
52	B/O Kamuti	17-10269	M		P	SSW	P	SW	J	R	4556-7593	LM	3	6	2.6	46.5	32.5	30	12654	13	0.05	142	4.6	110	10	11	enterococci	sterile
53	B/O Rumali	17-10898	M		HS	UW	HS	SSW	N	O	7594-11361	L	4	7	3.1	48.5	34	31.4	11250	14.2	0.06	137	4.1	99	13	16	klebseillapneumoniae	sterile
54	B/O Naksh	17-4528	F		MS	U	MS	SO	N	R	11362-15187	UL	3	5	2.8	46	33.5	31	10465	9.2	0.04	145	3.8	100	11	9	sterile	sterile
55	B/O Pooja	17-11514	M		MS	SW	MS	H	J	R	7594-11361	L	3	6	2.5	45	33	30.5	9086	17	0.07	150	6.4	105	14	18	sterile	staphylocoocusaureus
56	B/O Sikha	17-97012	M		HS	SO	HS	H	J	O	4556-7593	UL	2	5	2.3	45	32.5	29.5	11168	11.8	0.05	133	3.4	110	12	10	sterile	mixed growth
57	B/O Aarti	17-10703	F		G	SO	G	P	N	O	>30375	U	3	7	2.8	46	34	29	12246	15.7	0.06	145	3.9	102	13	6	sterile	sterile
58	B/O	17-	M		G	P	G	S	J	O	>3037	U	4	7	2.	45	33	30	86	11	0.	13	4.	10	12	22	sterile	klebseillapneu

Sl.	Name	Ip. No	Sex	Gestational Age	Father Education	Father Occupation	Mother Education	Mother Occupation	Type Of Family	Type Of House	Family Income	Socioeconomic Status	Apgar Score		Weight	Length	Head Cicumference	Chest Circumference	Total Leucocyte Count	Urea	Creatinine	Na	K	Cl	Hb	Crp	Investigations	
													1minute	5 Minute													Blood Culture And Sensitivity	Endotracheal Tube Culture & Sensitivity
	Maina	11226						O			5	M			6				54	.3	04	6	7	4				moniea
59	B/O Rinki	17-10645	F		PG	P	PG	SO	N	R	15188-30374	U	3	5	2.6	46	32.5	30	13462	16.7	0.05	132	4.2	106	14	8	sterile	sterile
60	B/O Swati	17-10947	M		G	SP	G	SSW	N	O	7594-11361	L	3	6	3.2	48	33.5	31	9880	10.6	0.04	143	5.1	101	11	10	klebseillapneumoniae	acinobacter spp.

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