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Prescription pattern of antibiotics in neonatal in intensive care unit

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Abstract
Introduction: Neonatal infection is the major cause of morbidity and mortality. 38% of children and infants were mostly susceptible to cause infective disease due to improper development of the immune system. For the treatment of infectious diseases in neonates and infants, antibiotics are most widely used. According to WHO formulation for children 2010 helps the physician to prescribe specific antibiotics to particular infections. The most important problem for prescribing antibiotics to infected children is that bacteria causing infection to neonate develops resistance against most of the antibiotics as well as such antibiotics may cause adverse drug reaction and drug interaction, but antibiotics are the only choice to prevent infectious disease in neonates. The aim of the study is to observe and analyze the suitable prescription pattern of antibiotics in neonates.
Aim: To study the prescription pattern of antibiotics in Neonatal patients.
Materials and Methods: The present study is a Prospective, observational, open Label, descriptive clinical conducted on 284 neonates over a period of one year. According to WHO ATC classification system 2013, antibiotics had been prescribed to the neonatal in NICU.
Results: Total of 284 neonates were selected in the study among them 190 were term and 94 were pretermed neonate. Among 190 termed neonate 136 were male and 54 were female ($p< 0.124$) were as in 94 pretermed neonate 68 were male and 26 were female ($p< 0.104$). as per this majority of death were observed in pretermed neonates 25.53% and 5.26% were from term neonates were as total death observed was 32 neonates. Some infections was noted in neonate, Neonatal Jaundice 132 (46.47%) followed by Pneumonia 94 (33.08%), Neonatal sepsis 12 (4.22 %), Prenatal asphyxias 14 (4.92 %) & Abdominal infections 32 (11.26%). Total of 284 infectious were observed in NICU admitted neonates. Amikacin 36 (16.43%), Amoxicillin + Clavulanic acid 42 (19.17%), Pipercicillin 30 (13.69 %), Fluconazole 26 (11.87%), Merapenem 22 (10.04%), Metronidazole 18 (8.21%), Levofloxacin 10 (4.56%), Gentamycin 16 (7.30%), Colistin 12 (5.47 %) and Cefotaxime sulbactam 05 (2.28%).
Conclusion: as per this study death of the neonates has been observe in premature neonates. Majority of the neonate were male in preterm and term neonates. Neonatal jaundice and Amoxicillin + Clavulanic acid was prescribed mostly in neonates admitted in NICU.

Keywords: Neonate, antibiotics, WHO ATC classification system 2013

Introduction
In Neonatal Intensive Care Unit (NICU), neonatal sepsis is the most common infection seen in neonates 1-3, among all the infectious disease, Prematurity in neonates are higher risk to develop bacterial infections. Majority of neonates mortality and mobility is due to septicemia compared to various systemic infectious in newborn such as septic shock, meningitis, pneumonia, arthritis, oseomyelitis and urinary tract infections. Were as 28% children and infants are more susceptible to cause infectious disease due to improper development of immune system. Several studies reported that 50 to 80% of children receive antibiotics. While prescription antibiotics to neonates, require more attention in order to avoid the, adverse drug reactions, drug resistance and Drug-drug interactions.

Aim: the main aim of the study is to prescribe suitable antibiotic in neonate of Neonatal Intensive Care Unit.

Material & Method
Study area and duration: The present study is a Prospective, observational, open Label, descriptive clinical study. According to WHO ATC classification system 2013, antibiotics had been prescribed to the neonatal in NICU.

Source of data: Data was collected from pediatrics department and neonates in NICU.

Data collection: All the data was collected from NICU. The data contain term and preterm, gestational age, birth weight, death, infectious, and antibiotics. This study was carried out for a period of one year.

Inclusion criteria

1. Patients admitted in NICU of tertiary care center and receiving antibiotics.
2. Patients willing to give informed consent

Exclusion Criteria

1. Not ready to give informed consent.
2. Not ready to give follow up is asked for.
3. Incomplete data entry in case record forms

Statistical analysis: The data were collected, entered and a master table was prepared using MS Excel software. The data were analyzed using appropriate statistical tools like percentage, chi-square test, etc, and a conclusion was drawn accordingly.

Ethical clearance: The ethical clearance of the study was obtained from the ethical committee of the institute.

Results

Table 1: Tabular representation of preterm and term in neonates in NICU.

	Term Neonates (190)		p value	Preterm Neonates (94)		p value
Gender	**Male**	**Female**		**Male**	**Female**	
No of Neonates	136	54	<0.124	68	26	<0.104
Percentage (%)	71.57%	28.42%		72.34%	27.65%	

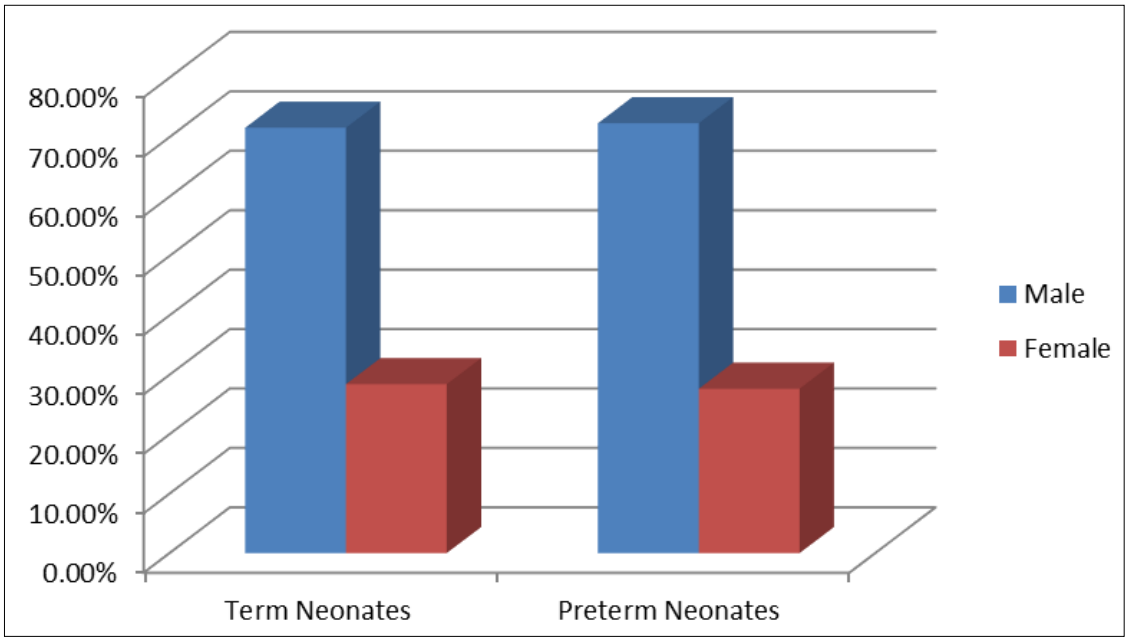

Fig 1: Graphical representation of percentage in preterm and term neonates in NICU.

Table 2: Tabular representation of death rate in preterm and term in neonates in NICU.

	Term Neonates (190)	Preterm Neonates (94)	Total No death rate.
No of death rate of Neonates in NICU	10	24	32
Percentage (%)	5.26%	25.53%	11.26%

Table 3: Tabular column represents infectious in Neonate at NICU.

S. No	Infections noticed in neonates	No of Neonate infected	Percentage
1	Neonatal Jaundice	132	46.47%
2	Pneumonia	94	33.08%
3	Neonatal sepsis	12	4.22%
4	Prenatal asphyxias	14	4.92%
5	Abdominal infections	32	11.26%
	Total	284	100%

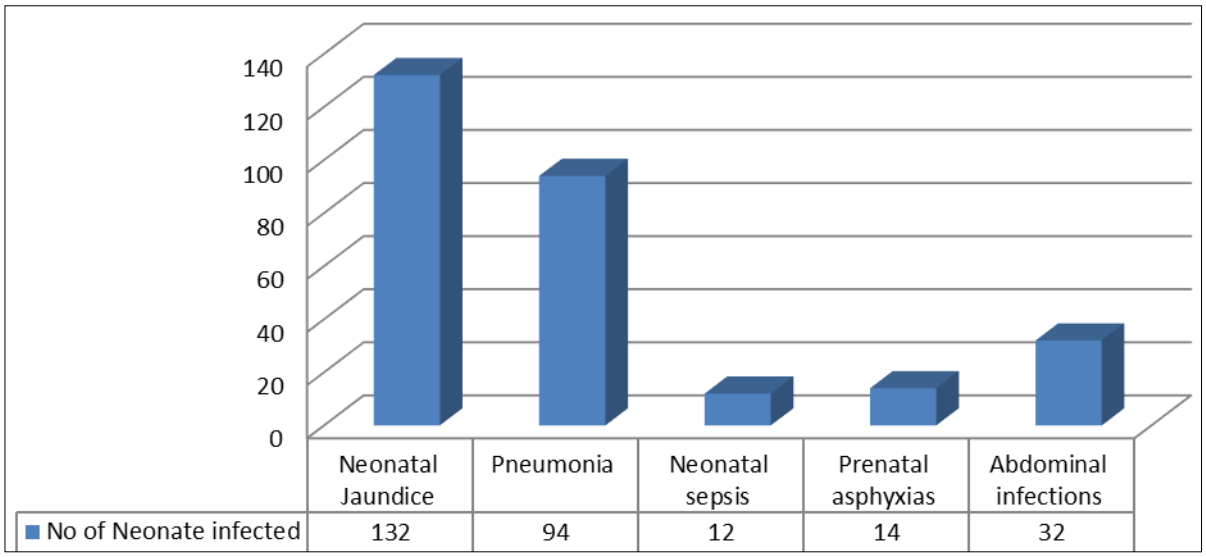

Fig 2: Graphical representation of infectious in Neonate at NICU.

Table 4: Tabular column represents antibiotics used in Neonate at NICU.

S. No	Drugs prescribed for antibiotics in neonates at NICU	No of antibiotics prescribed	Percentage
1	Amikacin	36	16.43%
2	Amoxicillin + Clavulanic acid	42	19.17%
3	Pipercicillin	30	13.69%
4	Fluconazole	26	11.87%
5	Merapenem	22	10.04%
6	Metronidazole	18	8.21%
7	Levofloxacin	10	4.56%
8	Gentamycin	16	7.30%
9	Colistin	12	5.47%
10	Cefotaxime sulbactam	05	2.28%
	Total No of antibiotics prescribed	219	100%

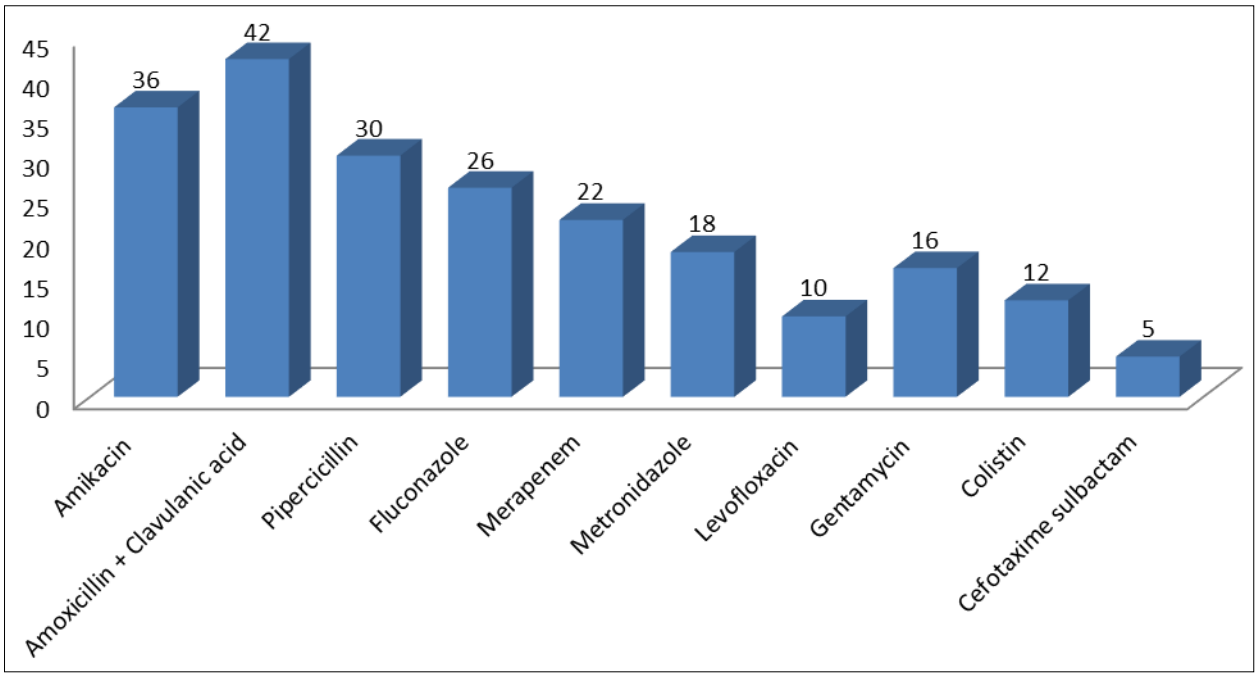

Fig 3: Graphical representation of antibiotics used in Neonate at NICU.

Discussion

The present study was a Prospective, observational, open Label, descriptive clinical study. According to WHO ATC classification system 2013, antibiotics had been prescribed to the neonatal in NICU. Total of 284 neonates were selected in the study among them 190 were term and 94 were pretermed neonate. Among 190 termed neonate 136 were male and 54 were female ($p< 0.124$) were as in 94 pretermed neonate 68 were male and 26 were female ($p< 0.104$). as per this majority of death were observed in pretermed neonates 25.53% and 5.26% were from term neonates were as total death observed was 32 neonates.

Some infections was noted in neonate, Neonatal Jaundice 132 (46.47%), Pneumonia 94 (33.08%), Neonatal sepsis 12 (4.22 %), Prenatal asphyxias 14 (4.92 %) & Abdominal infections 32 (11.26%). Baig MS *et al*. (2019) [7], as per there study most infectious disease observed was EOS pneumonia 29.84, LOS pneumonia 20.56, EOS PROM 16.13 EOS meningitis 6.05, LOS NEC 6.05 LOS BC +ve 5.24 LOS CRP+ve 5.24, EOS CRP +ve 2.82, LOS meningitis 2.82, LOS PROM 2.82, EOS BC +ve 2.02 and EOS NEC 1 0.40. Were as total of 219 antibiotics were prescribed to infectious neonate admitted in NICU. Total of 284 infectious were observed in NICU admitted neonates. Amikacin 36 (16.43%), Amoxicillin + Clavulanic acid 42 (19.17%), Pipercicillin 30 (13.69 %), Fluconazole 26 (11.87%), Merapenem 22 (10.04%), Metronidazole 18 (8.21%), Levofloxacin 10 (4.56%), Gentamycin 16 (7.30%), Colistin 12 (5.47 %) and Cefotaxime sulbactam 05 (2.28%). Our study does not coincides with the study of Our study concides with the study of Baig MS *et al*. (2019) [7] Amoxicillin + clavulanate 248, Gentamycin 241, Piperacillin 70, Fluconazole 38, Meropenem 28, Linezolid 06 Vancomycin 05. Our study also concides with the study of Sonali Suryawanshi *et al*. (2015) [6] also prescribed antibiotics to neonates admitted in NICU, Amikacin 187, Cefotaxime Sulbactam 168, Levofloxacin 137, Piperacillin – Tazobactam 112, Netilmycin, 89, Meropenem 84, Amoxycillin-Clavulanic Acid 81, Vancomycin 66, Fluconazole 30, Metronidazole 27, and Colistin 26.

Conclusion: As per this study death of the neonates has been observe in premature neonates. Majority of the neonate were male in preterm and term neonates.

Conclusion

Neonatal jaundice and pneumonia were observed in majority of neonates and prescribed with Amoxicillin + Clavulanic in neonate admitted in NICU. as per this study death of the neonates has been observe in premature neonates. Majority of the neonate were male in preterm and term neonates. Neonatal jaundice and Amoxicillin + Clavulanic acid was prescribed mostly in neonates admitted in NICU.

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