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Prescribing pattern of drugs in SNCU at a tertiary care hospital in South India

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ABSTRACT

BACKGROUND

SNCU (Sick New Born Care Unit) is meant to reduce the case fatality among sick newborns, either born within the hospital or outside including home delivery. The study of prescribing pattern is a part of the medical audit and seeks to monitor, evaluate and if necessary, suggest modification in prescribing practices to make medical care rational and cost effective.

MATERIALS AND METHODS

This is a record based observational study carried out in sick new born care unit, at a tertiary care hospital in south India. The study was conducted for a period of 6 months from Jan 2017 to June 2017. The data of 144 neonates admitted was collected from the records of SNCU. The recorded data were analyzed by Microsoft office excel 2007.

RESULTS

In the present study, the pattern of drug use in 144 sick new borns was assessed. There was male predominance. Majority of the sick new borns were admitted in early neonatal period. About 21% being preterm, 32% of them were low birth weight and most common observed reason for admission to SNCU was Respiratory distress syndrome(41%) followed by Premature delivery (15%), neonatal jaundice(14%), meconium aspiration syndrome(9%). Most commonly prescribed drugs were Antibiotics (90.3%) followed by Vitamins K (38.2%), Minerals (26.4%), Antacids (22%), Antiprotozoal (18.8%), Antiepileptics (14.6%). Among antibiotics amikacin (85.42%) was the most commonly prescribed followed by Piperacillin +Tazobactam (70.84%), Meropenam (27%), Cefotaxim (9.7%), Linezolid (6.25%) and Vancomycin (2.8%).

CONCLUSION

Neonates being vulnerable group due to immaturity of their body functions, great care needs to be taken to minimize the number of drugs per neonate. Data reported in this study about various drugs prescribed, antibiotics being of major concern will be helpful in establishing priority agendas for future drug studies. The main aim of our study is to encourage the treating physicians for creating specific priorities for developing standard guidelines in drug usage specifically for neonates.

Keywords: SNCU, Prescribing pattern, Neonates.

INTRODUCTION

The first week of life is the most crucial period in the life of an infant. In India, 61.3% of all infant deaths occur within the first month of life. Of these more than half may die during the first week of birth [1]. Out of 3.9 million neonatal deaths worldwide, India is accounting to 1.2 million or nearly 30% of global neonatal mortality [2].

Neonates are among the most vulnerable population groups to contract infections [3] and of the four million neonatal deaths that occurs globally each year, more than one third is contributed by severe infection [4]. SNCUs are meant to reduce the case fatality among sick newborns, either born within the hospital or outside including home delivery. It also acts as the teaching and training hub for imparting the skills of newborn care [5]. Premature and those born out of high risk pregnancies, are at greater risk for medication exposure [6].

Neonates are also vulnerable to adverse consequences of drug use due to their immature organ system, which are particularly more likely in high-risk neonates such as premature, LBW or critically ill. Accordingly, caution is required while exposing such neonates to various medications [7]. So the care is to be taken to use the drugs as minimum number as possible.

Besides, due to economic and ethical issues, children do not often participate in clinical trials, and specific knowledge about the effect of drugs in children is often inadequate [8]. There is no universally accepted and standardized guidelines regarding the rational prescribing and individualizing the medication in neonatal intensive care. Developing countries have limited funds available for health care and drugs so it becomes very important to prescribe drugs rationally so that the available funds can be utilized optimally [9].

The study of prescribing pattern is a part of the medical audit and seeks to monitor, evaluate and if

necessary, suggest modification in prescribing practices to make medical care rational and cost effective

MATERIALS AND METHODS

This is a record based observational study carried out in sick new born care unit, at a tertiary care hospital in south India, after approval from institutional ethics committee. The study was conducted for a period of 6 months from January 2017 to June 2017. The data of all the 144 neonates admitted was collected from the records of SNCU. All cases admitted for more than 24hrs were included in the study and death cases were excluded from the study. The recorded data were analyzed by Microsoft office excel 2007 and using descriptive statistics, the results were depicted in the form of tables and graphs.

RESULTS

In the present study, the pattern of drug use in 144 sick new borns was assessed. There was male predominance in our study; out of 144 cases included 55% were male. Majority of the sick new borns were admitted in early neonatal period (93.6%). Majority of sick new born were term (85.4%) followed by preterm (14.6%). Mean birth weight of sick new born was 2.6Kg. 3.5% sick newborn were very low birth weight, 28.5% were low birth weight and 68% were normal weight. (**Table 1**)

Most common observed reason for admission to SNCU was Respiratory distress syndrome (41%). Premature delivery (15%) was 2nd most common reason followed by neonatal jaundice (14%), meconium aspiration syndrome (9%), birth asphyxia (4%), hyperthermia (4%), Hypoglycemia (1%), Neonatal sepsis (1%), Maternal varicella (1%), Hematemesis (1%) and miscellaneous (9%). (**Figure 1**)

Table 1: Demographic details of patients in SNCU

Demographic details	Number (%)
1 Age	
0-6 days	135 (93.6)
7-28 days	9 (6.4)
2 Sex	
Male	79 (55)

Female	65	(45)
3 Period of gestation		
Term	123	(85.4)
preterm	21	(14.6)
4 Birth weight		
Very low birth weight	5	(3.5)
Low birth weight	41	(28.5)
Normal birth weight	98	(68)

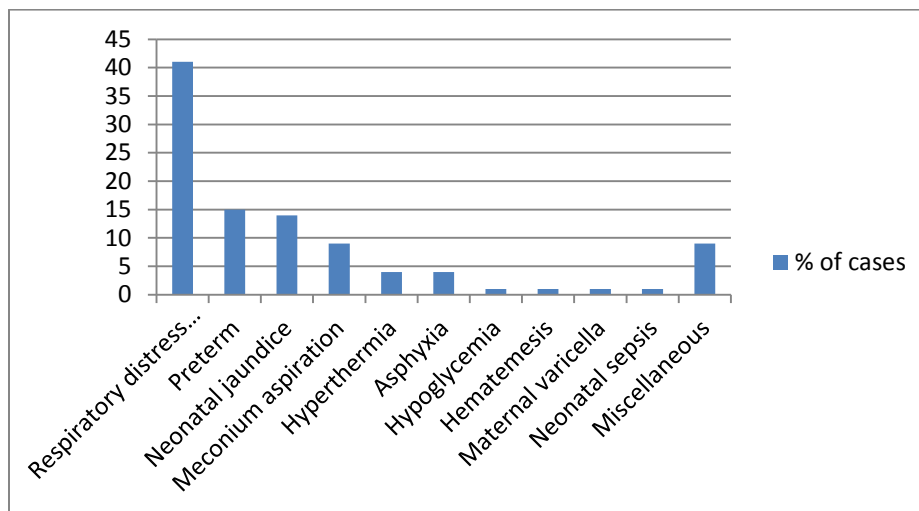


Figure1: Cause of admission of newborn to SNCU

In the SNCU most commonly prescribed drugs were Antibiotics (90.3%), followed by Vitamins k (38.2%), Minerals (26.4%), Antacids (22%), Antiprotozoal (18.8%), Antiepileptics (14.6%), Antiemetics (0.03%) and Antifungal (0.02%). **(Figure 2)**

Among antibiotics amikacin (85.42%) was the most commonly prescribed followed by piperacillin +Tazobactam (70.84%), meropenam (27%),

Cefotaxim (9.7%), Linezolid (6.25%) and Vancomycin (2.8%). **(Figure 3)**

Total number of prescription items was 488. Average number of drugs per neonate being 3.32. 90.3% of the prescriptions consists of antibiotics. Most common route of drug administration was intravenous (92.4%) followed by oral (4.9%), followed by topical (2.8%). Mean number of days per hospital admission 7.8. **(Table 2)**

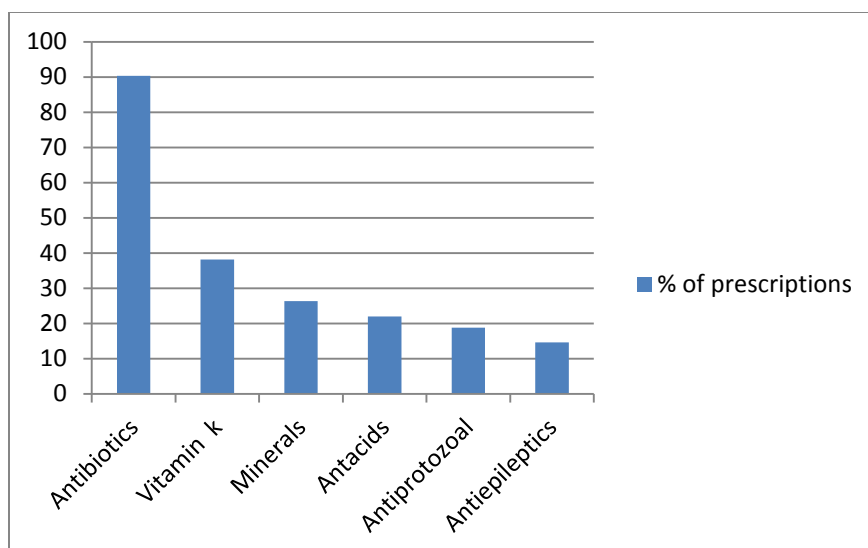


Figure 2: Prescription pattern of drugs in SNCU

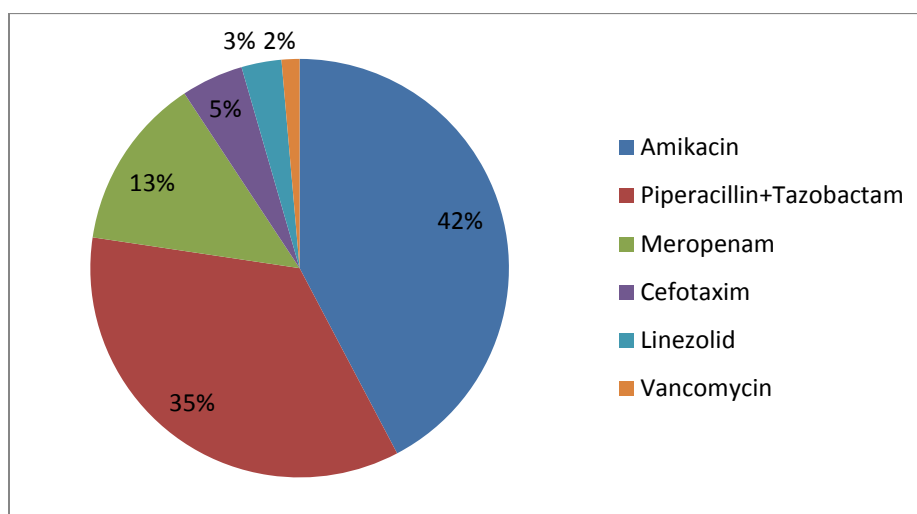


Figure 3: Antibiotics prescribed in SNCU

Table 2: WHO core Indicators

WHO core indicators	
Total number of prescription items	488
Average number of drugs per neonate	3.32
Prescriptions with antibiotics (%)	90.3
Prescriptions with injections (%)	92.4
Days per hospital admission (mean)	7.8

DISCUSSION

In present study, drug prescribing pattern in 144 sick newborn was assessed. There was a male predominance (55%) in our study consistent with other similar type of studies [10]. The gender discrimination in terms of access to health care is

apparent in the study. There is immediate need to create awareness against gender discrimination which begins at an early age [11].

Majority of neonates in our study were term (85.4%) followed by preterm (14.6%). There are several other studies which show predominance of preterm over term neonates [7, 12]. It is quite evident

that significantly large (68%) number of neonates was normal birth weight in our study. Majority of preterm neonates were having low birth weight (17.36%) and few (3.5%) having very low birth weight. Mean birth weight was 2.61 ± 0.6 Kg in our study. Low birth weight (LBW) infants remain vulnerable to malnutrition, recurrent infections, neuro-developmental disabilities and experience higher mortality [7].

In our study 93.6% patients were admitted in early neonatal period. This is in accordance with study done by Junejo et al. in which patients admitted in early neonatal period were 83.4% [13] Mean age of neonates was 3.36 ± 4.16 days. A neonate is particularly vulnerable to adverse influences like asphyxia, infection, complications of preterm birth etc. during early neonatal days [7] and requires special attention.

Respiratory distress syndrome was most common observed reason for admission to SNCU. Preterm with low birth weight was second most reason followed by neonatal jaundice, meconium aspiration syndrome, Hyperthermia, Birth asphyxia and others. [Neonatal sepsis, Maternal varicella, Hypoglycemia, Hematemesis, Bleeding from umbilicus etc.] Respiratory distress syndrome was the major cause for admission to SNCU as it is attributed by preterm, low birth weight and birth asphyxia. This is in contrast to several other studies showing neonatal sepsis as major cause because majority of the neonates in our study are term with normal birth weight [7]

Most frequently prescribed drugs in SNCU were antibiotics (90.3%) among which amikacin (85.42%), Piperacillin+Tazobactam (70.84%), meropenem (27%), cefotaxim (9.7%) were commonly prescribed. In study done by uppal et al, Amikacin (62%), Penicillin (44%) And Cefotaxim (38%) were commonly used antibiotics [14]. The susceptibility is enhanced if the Piperacillin+Tazobactam was added with Amikacin. This combination is a feasible empirical therapy for extended spectrum b-lactamases [15]. This was also evident from our study. However, selection of empirical antibiotic regimen depend upon locally prevalent organism and their sensitivity/resistance pattern. So there is a need to formulate antibiotic policy in every hospital because the resistance of pathogenic microorganism to antimicrobial is increasing and it is difficult to keep pace with the

development of resistance [7]. Higher incidences of antibiotic exposure in SNCU could be due to common practice of prescribing antibiotics without waiting for outcome of bacterial culture results in neonates and may be due to seriousness of illness in neonates. However, inappropriate use of antibiotics leads to emergence of resistance. So antibiotic surveillance is mandatory to optimize antibiotic therapy especially in culture negative patients with infection like symptoms [16].

Besides other drugs used were vitamin k (38.2%), minerals (26.4%), antacids (22%), antiprotozoal (18.8%), antiepileptic (21%) etc. Vitamin K deficiency bleeding is of particular concern in neonates as they are born with low levels of Vitamin K. Current recommendations suggests single intramuscular administration of Vitamin K is an effective, safe and sustainable approach to preventing VKDB (Vitamin K deficiency bleeding) [17].

In this study, the average number of drugs per encounter were 3.6 consistent with study of Choure et al 2017 (3.6%) [18]. An average number of drugs per prescription should always be kept low as it can lead to increase in unnecessary cost of treatment, higher possibility of drug-drug interaction, and also increase the risk of adverse drug reactions and antibiotic resistance.

In our study total encounters with an injection prescribed were (92.4%). Similar findings were observed by Chatterjee et al in which intravenous route (92.1%) was the commonest route of drug administration [19]. Parenteral route is commonly seen in SNCU and it plays important role in management of sick neonates until they can tolerate enteral/oral feeding. Higher incidences (90.3%) of antibiotic exposure in SNCU could be due to the common practice of instituting empirical therapy. However, inappropriate use of antibiotics leads to emergence of resistance. The development of effective control programs through adoption of measures that restrict use of specific antimicrobials, establishment of therapeutic guideline, a constant monitoring of the resistance pattern of the common pathogenic organisms in the hospital are recommended to improve the usage of antibiotics

CONCLUSION

The present study reflects the common problem for admission of neonates and overall drug

prescribing pattern in a tertiary care SNCU. Neonates being vulnerable group due to immaturity of their body functions, great care needs to be taken to minimize the number of drugs per neonate. Data reported in this study about various drugs prescribed, antibiotics being of major concern will be helpful in establishing priority agendas for future drug studies.

Rational use of antibiotic prevents antimicrobial resistance. Our report can enable the treating physicians to encourage for creating specific priorities for developing an antibiotic use guideline for specifically neonates which is most vulnerable population.

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