



AUDIT OF ANTIBIOTICS USED IN PEDIATRIC WARD OF A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Background: Increasing resistance to the antibiotics is becoming major threat to public health. Most of the children admitted to Pediatric Intensive Care Unit (PICU) have life threatening illnesses. The admitted children may already have infection or acquire various infections due to different procedures, use of invasive devices, and extended length of stay.

Objectives: To audit the antibiotics used in pediatric ward to generate a profile of antimicrobial use and suspected adverse drug reactions (ADRs) attributable to them.

Materials and methods: The present study was conducted in Pediatric ward of Shri. Chhatrapati Shivaji Maharaj Sarvopchar Rughalaya, a teaching hospital in Solapur, from January 2018 to June 2018. For the study, we selected patients admitted to the pediatric ward. A total of 100 patients of either sex or ranging from age of 1- 14 years were included in the study. The prescriptions of the patients were taken and details such as type of antibiotics prescribed, dosage of the antibiotics, duration of the therapy, and number of drugs were recorded. **Results:** A total of 224 patients were studied and with respect to age showed more cases were from 3-6 year age group i.e. 87 (38.84%) with mean age \pm standard deviation was 05.45 ± 01.59 years and male contribution was 60.71% i.e. 136 in comparison to female i.e. 88 (39.29%). Mean weight and height \pm standard deviation was found to be 14.80 ± 07.23 kg and 88.32 ± 19.54 Cm respectively. **Conclusion:** Over prescription of antibiotics is one of the major issues in pediatric wards, so it's a need to update guidelines for prescribers for appropriate and rational use of antibiotics to prevent development of resistance to these drugs.

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INTRODUCTION

Increasing resistance to the antibiotics is becoming major threat to public health. Various studies showed the correlation between antibiotic use and resistance development. Most of the children admitted to Pediatric Intensive Care Unit (PICU) have life threatening illnesses. The admitted children may already have infection or acquire various infections due to different procedures, use of invasive devices, and extended length of stay.¹ Antibiotics are the most commonly used medicines in the PICU². The use of antibiotics may be helpful in preventing hospital acquired infections, but their irrational and unnecessary use has serious disadvantages. Inappropriate and prolonged use of antibiotics has leads to emergence of antibiotic resistance which is an important clinical, economic, and public health problem³. Developing countries are the most affected by resistance of high infectious disease burden; limited access to quality assured antibiotics and more optimal drugs and poor antibiotic use practices⁴⁻⁸.

ADRs in pediatric population may have relatively more severe effect than adults leading to significant morbidity among children⁹. Few studies have been published regarding the use of antibiotics in pediatric critically ill patients hence; we planned the present audit the antibiotics used in pediatric ward of tertiary care teaching hospital.

MATERIALS AND METHODS

A Prospective observational study was conducted in Pediatric ward of Shri. Chhatrapati Shivaji Maharaj Sarvopchar Rughalaya, a teaching hospital in Solapur, from January 2018 to June 2018. The study was approved from the ethical committee of the institute prior to commencement of the study. For the study, we selected patients admitted to the pediatric ward. A total of 224 patients of both sex and ranging from age of 1- 14 years were included in the study. An informed written consent was obtained from the guardians of the children after verbally explaining them the protocol of the study. The prescriptions of the patients were taken and details such as type of antibiotics prescribed, dosage of the antibiotics,

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duration of the therapy, and number of drugs were recorded. The recorded data was subjected for statistical analysis.

Selection criteria of patients

Inclusion criteria: Below 14 years, both Genders (male and female), patients prescribed with antibiotic and Inpatient of pediatric ward only.

Exclusion criteria: Birth defective pediatric patients, patients show drug interaction and patients with severe side effects to antibiotics.

WHO prescribing indicators

The obtained data were quantitatively analyzed using WHO prescribing indicators:

1. Average number of drugs per patient prescribed
2. Percentage of encounters with an antibiotic prescribed
3. Percentage of antibiotics with an injection prescribed
4. Percentage of antibiotics prescribed with generic name
5. Percentage of antibiotics prescribed from the hospital formulary

Sampling Technique: Data will be analysed through SPSS V22 and confidence level will be 95% and level of significance will not be more than 5%.

RESULTS

Table 1 Age, gender and anthropometric distribution of selected patients (n=224)

Variables	Number of patients	Percentage
Age in years		
0-3 years	58	25.90%
3-6 years	87	38.84%
6-9 years	41	18.30%
9-12 years	29	12.95%
12-14 years	09	04.02%
Mean age ± S.D	05.45 ± 01.59	
Gender		
Male	136	60.71%
Female	88	39.29%
Anthropometry		
Weight on admission in Kg(Mean ± SD)	14.8±7.23	
Height on admission in Cm (Mean ± SD)	88.32±19.54	

Table 1 shows distribution of patients with respect to age which showed more cases were from 3-6 year age group i.e. 87 (38.84%) with mean age ± standard deviation was 05.45 ± 01.59 years and male contribution was 60.71% i.e. 136 in comparison to female i.e. 88 (39.29%). Mean weight and height ± standard deviation was found to be 14.80 ± 07.23 kg and 88.32±19.54 Cm respectively.

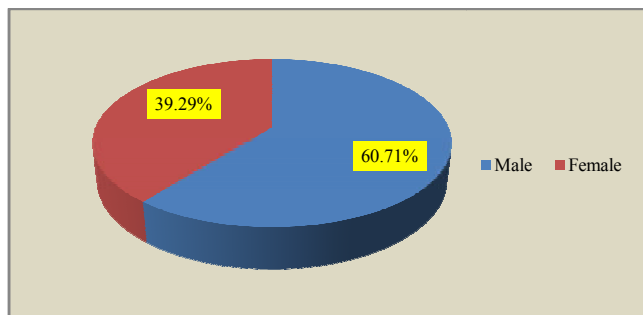


Fig 1 Gender distribution of studied patients

Table 2 WHO core prescribing indicators

Indicators	Percentage (%)
Average number of drugs per encounter	05.76
Number of antibiotics prescribed per prescription	02.61 ± 00.98
Percentage of antibiotics with an injectable	87%
Percentage of antibiotics with generic names	92.24%
Percentage of antibiotics prescribed from hospital formulary	99.68%

Table 2 showed according to WHO prescribing indicators most of the indicators are in standard percentage like Average number of drugs per encounter, Number of antibiotics prescribed per prescription, Percentage of antibiotics with an injectable, Percentage of antibiotics with generic names and Percentage of antibiotics prescribed from hospital formulary were 05.76, 02.61 ± 00.98, 87%, 02.24% and 99.68% respectively.

Table 3 Diagnostic categories of patients who received antibiotics in Paediatric ward

Diagnosis	Number	Percentage
Respiratory	81	36.16%
Neurological	19	08.48%
Medical Cardiac/shock	23	10.27%
Gastrointestinal	52	23.21%
Miscellaneous	06	02.68%
Surgical Surgery/Trauma	43	19.12%

Table 3 showed most number of respiratory cases got antibiotics i.e. 81 (36.16%), followed by gastro-intestinal i.e. 52 (23.21%) respectively.

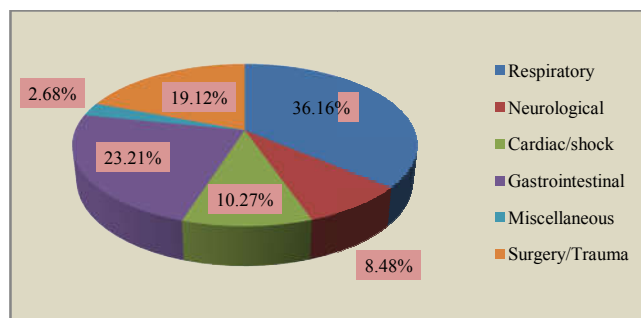


Fig 2 Diagnostic categories of patients who received antibiotics in Paediatric ward

Table 4 Frequency of patients with prescribed antibiotics

Type of antibiotics	Number of patients	ATC code	Percentage %
Penicillin G	52	J01CA	23.21%
Gentamicin	39	J01GB	17.41%
Ampicillin	34	J01CR	15.18%
Cloxacillin	27	J01CR	12.05%
Amoxicillin	46	J01CR	20.53%
Ceftriaxone	11	J01DD	04.91%
*Others	15	P01AX	06.70%
Total	224	-----	100.00%

*Others: Nitroimidazole derivatives & agents against amoebiasis and other protozoal diseases

Table 4 showed most number of prescribed antibiotics were penicillin G i.e. 52 (23.21%) followed by amoxicillin i.e. 20.53% respectively.

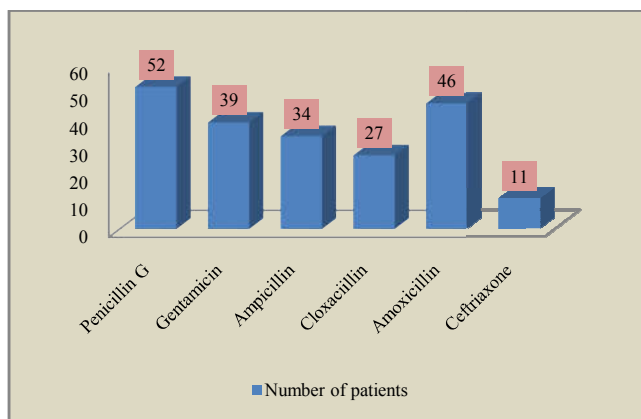


Fig 3 Frequency of patients with prescribed antibiotics

DISCUSSION

The present study was conducted to audit the antibiotics used in pediatric ward of tertiary care teaching hospital. A total of 224 patients were studied and with respect to age showed more cases were from 3-6 year age group i.e. 87 (38.84%) with mean age \pm standard deviation was 05.45 ± 01.59 years and male contribution was 60.71% i.e. 136 in comparison to female i.e. 88 (39.29%). Mean weight and height \pm standard deviation was found to be 14.80 ± 07.23 kg and 88.32 ± 19.54 Cm respectively. According to WHO prescribing indicators most of the indicators are in standard percentage like Average number of drugs per encounter, Number of antibiotics prescribed per prescription, Percentage of antibiotics with an injectable, Percentage of antibiotics with generic names and Percentage of antibiotics prescribed from hospital formulary were 05.76, 02.61 ± 00.98 , 87%, 02.24% and 99.68% respectively. Most number of respiratory cases got antibiotics i.e. 81 (36.16%), followed by gastro-intestinal i.e. 52 (23.21%) and most number of prescribed antibiotics were penicillin G i.e. 52 (23.21%) followed by amoxicillin i.e. 20.53% respectively.

The results were compared with previous studies and results were consistent. Ahiabu MA *et al*¹⁰ in their study stated that average number of medicines prescribed per subject was 4.01, antibiotics prescriptions were 59.9% out of which 24.2% were given by parental route. Pandey AA *et al*¹¹ in their study explained drug prescribing patterns at PICU. They found that the average number of drugs per study subject was of 2.5. Antibiotics were included in 1087 (79%) prescriptions while the injectable drugs were prescribed in 22 (1.6%) prescriptions. Baby B *et al*¹⁴, Mathew R *et al*¹⁵ and Mukherjee S *et al*¹⁶ study also shows similar results and comparable to present study also.

Swingler G *et al*¹² examined the antibiotic management in their research and found that 68 (51.9%) study subjects were treated with antibiotics, 25 patients treated for for 2 days or less and 43 study subjects treated for longer than 2 days. The prescribed antibiotic treatment was retrospectively found to be unjustified in 35 (81.4%) of the 43 patients treated for longer than 2 days. They concluded that no significant associations were found with treatment for 2 days or less and beyond 2 days. In the study done by Kebede HK *et al*¹³ the antimicrobials were prescribed for 407(86.4%) patients of which 85.9% were in the form of injectable. The parentally administered drugs were 1241 (90%) in number while by oral route 110 (8%) drugs. The maximum numbers of medicines

per prescription were 08 for all types of drugs in general, and 05 for antimicrobials in particular. In their study they stated that among 812 antibiotics prescribed; Penicillin G was the most (20%) followed by gentamicin (19%) and ampicillin (16%) were frequently prescribed drugs. Most of theof the prescribed antibiotics were antimicrobials, and was in the form of injectables. Baby B *et al*¹⁴, Mathew R *et al*¹⁵ and Mukherjee S *et al*¹⁶ study also shows similar results and comparable to present study also.

Strength of Study: Very limited studies and data available about similar study in India and also in developing countries so this data will be useful for medical professionals in India and developing countries.

Limitations of Study: Though it is need of developing countries but the this sample is only a very small proportion of the entire population of in the country and The data collection was confined to only particular limited area of country since constraints were faced during data collection.

CONCLUSION

Over prescription of antibiotics is one of the major issue in pediatric wards. There is a need to update guidelines for prescribers for appropriate and rational use of medicines, especially antibiotics to prevent development of resistance to these drugs.

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