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Research Article

**DISEASE PREVALANCE, PHARMACOECONOMIC STUDY
AND PRESCRIPTION PATTERN STUDY IN PEDIATRIC
PATIENTS.**Md. Tarique Nadeem**¹, Manoj Kumar², Manasa.P³, Panakala Rao⁴, Sanjesh Kumar⁵¹Ph.D Research Fellow, Department of Endocrinology, Jawaharlal Institute of Postgraduate Medical Education and Research²Pharm.D 6thYear, Smt.SarojiniRamulamma College of Pharmacy.³Pharm.D 6thYear, Smt.SarojiniRamulamma College of Pharmacy.⁴Pharm.D 6thYear, Smt.SarojiniRamulamma College of Pharmacy.⁵ART Centre, Rajendra Memorial Research Institute and Medical Sciences, Patna.**Abstract:**

Introduction: Paediatrics is the branch of medicine which deals with the development, growth, diseases and disorders in children. **Materials and Methods:** Our research as a prospective observational study was performed on 140 type 2 paediatric patients in Mahabubnagar (INDIA). Patients diagnosed with multiple diseases were included in the study. Patient demographic details, medication chart, cost of drugs and Pharmacy bills were collected from the patient. KUPPUSWAMY SCALE was used to analyse the socio economic status of guardians of patients. Gained data was analysed by using SPSS statistical software version 22.2 and Microsoft Excel 2007. **Results:** It is observed that male infants are more prone to diseases than female infants. The most commonly occurring diseases among paediatrics was found to be fever. Antibiotics were found to be most commonly used drugs. The most common type of antibiotics prescribed were penicillin's, cephalosporins, macrolide, aminoglycoside, tetracyclines, glycopeptides antibiotics. The mean cost of generic drug prescriptions is 169.27±47.2 whereas that of brand drug prescriptions is 347.85±59.6. The P value was found to be 0.015. **Conclusion:** There should be close monitoring over prescription pattern in paediatric population. It also highlights the need of rational use of drugs, prescribing by generics and from EDL. Continuing education regarding rational prescribing and developing easy guidelines for prescribing in common diseases in children is highly recommended.

Key Words: Paediatrics, prescription pattern, cost minimisation analysis, rational drug use.**Corresponding author:**

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INTRODUCTION:

Paediatrics is the branch of medicine which deals with the development, growth, diseases and disorders in children. [1] The prevalence of a diseases or illness is sdefined as the number of individuals who suffer at any moment. One third of the world population comprises of children in which three quarters come up from less developed countries[2]. Causes of death in under 5 age group was shown in Africa and Western Europe. Out of the total death 75% were due to six causes namely pneumonia, diarrhea, neonatal sepsis, preterm delivery, asphyxia at birth, under nutrition[3]. Pharmacoeconomics is a branch of health economics which deals with costs and benefits of drug therapy. Therefore knowledge regarding pharmacoeconomics is essential for physician to promote rational se of drugs[4]. Pharmacoeconomic evaluations assess whether the outcome of the given drug justifies the cost. The nature of assessment may be of different types but requires comparison of two different treatments costs and benefits[5]. A prescription (R) is a health-care program implemented by a physician or other medical doctors in the form of instructions that govern the plan of care for an individual patient. Prescription Pattern helps as an auditing tool which helps in developing a more comprehensive medical system with more benefits and less errors[6]. Since decades, Drugs are being prescribed to paediatrics based on the clinical study reports of adults because no studies are conducted in children due to lack of safety and efficacy profile of drugs. However these type of prescribing leads to serious complications because there are differences seen in the pharmacokinetic and dynamic profiles of paediatrics when compared to adults.[7, 8] Monitoring the prescriptions identifies the problems in it and it also serves as an aid to physician as a feedback to create an awareness regarding irrational use of drugs. Medical audit also serves as a tool of medical treatment all levels of health care system[9]. The study of prescribing pattern is also a type of medical audit which seeks continuous monitoring and necessary modifications in the prescribing practices of the practioners to achieve rational use of drugs[10]. It is important to define prescribing pattern as it identifies the irrational prescribing habits of the physicians which aids as a remedial message to the prescribers. Keeping all these facts in consideration, the present study was planned to analyze the pattern of drug use at different health care levels in Mahabubnagar, India.

MATERIALS AND METHODS:

This research- is a prospective observational study conducted at a 300 bedded super speciality teaching

hospital at Mahabubnagar. The study was conducted for a period of six months and the study was approved by approved by the Institutional Ethical Committee (IEC) of the hospital ref.id. SVSMC/IEC/2016/11.. Sample size was 140 patients. Patients visiting paediatrics department who were diagnosed with multiple diseases were included in the study. Patient demographic details, medication chart, cost of drugs was obtained from the prescription after obtaining the consent. Pharmacy bills and other relevant information was collected from the patient and entered in the data collection form. KUPPUSWAMY SCALE was used to analyse the socio economic status of guardians of patients. Comparison of generic drug prescriptions and brand drug prescriptions was done to evaluate the pharmacoeconomic parameter. Further statistical analysis was carried using SPSS statistical software version 22.2 and Microsoft Excel 2007. Categorical variables were described as percentages for the total sample.

RESULTS:

It is observed that male infants are more prone to diseases than female infants. According to KUPPUSWAMY SCALE Socio-Economic Status of guardians was analyzed and found to be as lower poor class: 18 cases, lower/upper poor : 63 cases, middle/lower middle : 15 cases upper middle : 37 cases and upper class : 7 case. It is shown in table 1. The most commonly occurring diseases among paediatrics was found to be fever which is having highest prevalence of 22.87% followed by pneumonia 15.71% and seizures 10.71%. It is described in table 2. According to system wise distribution of diseases out of 140 patients infectious diseases are more leading cause of hospital admission among paediatrics which were found to be 33.6%, respiratory system have found to be 23.6%, disorders of CNS were 11.5% prevalent whereas GI problems were 7.9%, haematological disorders were 5.8% prevalent, hepatic cases 3.5%, poisoning cases are 4.2%. It is shown in table 3. Distribution of Drugs According to Therapeutic Class in total Prescriptions was analyzed. Antibiotics were found to be most commonly used with 24% followed by analgesics and antipyretics 13.6%. The most common type of antibiotics prescribed were penicillin's 35, cephalosporins 73, macrolide 10, aminoglycoside 19, tetracyclins 4, glycopeptides antibiotics 8. Types of dosage forms in the prescriptions were calculated and was found as IV 373, 51tablets, 104 syrups, 15 suspensions, 11 suppositories, 53 nebuliser, 9 inhalations, 7 nasal drops, 6 ointments. It is shown in table 4, 5, 6. The mean cost of generic drug prescriptions is 169.27 ± 47.2 whereas that of brand

drug prescriptions is 347.85 ± 59.6 . The P value was found to be 0.015. The results are shown in table 7.

Table 1: Characteristics of the sample (N=140)

Variable	N	%
Gender		
Male	85	60.7
Female	55	30.3
Age group		
Upto 1 year	38	27.15
1-5 years	60	42.85
6 – 11 years	42	30
Socio Economic Status		
Lower poor	18	13
Lower/Upper poor	63	45
Middle/loer middle	15	11
Upper middle	37	26
Upper class	07	05

Table 2: Distribution of Patients According to their Disease Condition

DISEASE	NO OF CASES	PERCENTAGE
Ge	10	7.14%
Pleural effusion	1	0.71%
Juvdm	1	0.71%
Dka	1	0.71%
Anemia	8	5.71%
Fever	32	22.85%
Malaria	4	2.8%
Dengue	2	1.5%
Diarrhoea	9	6.4%
Jaundice	4	2.8%
Hepatittis	1	0.7%
Seizures	15	10.71%
Sle	1	0.71%
Muscular dystrophy	1	0.71%
Downs syndrome	1	0.71%
Amoebic dysentery	1	0.71%
Bronchiolitis	4	2.8%
Chf	2	1.5%
Poisoning	6	4.2%
Uti	2	1.5%
Cellulitis	1	0.71%
Acute meningocephalitis	1	0.71%
Cervical lymphadenopathy	2	1.5%
Rheumaic heart disease	1	0.71%
Nephrotic syndrome	1	0.71%
Urti	6	4.2%

Table 3: Distribution of Patients According to their system involvement

SYSTEM WISE PREVALENCE	NO OF CASES	PERCENTAGE
Respiratory diseases	33	23.6%
Hepatic diseases	5	3.5%
Endocrine disorders	2	1.5%
Gi diseases	11	7.9%
Hematological disorders	8	5.8%
Cns disorders	16	11.5%
Musculoskeletal system	1	0.71%
Chromosomal disorders	1	0.71%
Cardiovascular diseases	3	2.14%
Renal diseases	3	2.14%
Poisoning	6	4.2%
Dermal diseases	1	0.7%
Multiorgan disorder	1	0.71%
Lymphatic diseases	2	1.4%
Other infections	47	33.6%

Table 4: Distributions of Drugs According to Therapeutic Class in Total Prescriptions

THERAPEUTIC CATEGORY	NO OF DRUGS	PERCENTAGE (%)
Anti emetic's	40	6.35%
Ant diabetic	8	1.2%
Normal saline	58	9.6%
Antibiotics	149	24%
Multi vitamins	29	4.8%
Antihistamines	23	3.6%
Anti malarial	13	1.9%
Analgesics and antipyretics	84	13.6%
Antiprotozoal	15	2.4%
Diuretics	9	1.4%
Antacids	62	9.7%
Moisturizer	8	1.2%
Anti diahoearral	11	1.7%
Hepatic protectants	5	0.7%
Bronchodilators	40	6.5%
Anticonvulsants	39	6.1%
Ors	13	1.9%
Nasal drops	10	1.7%
Steroids	10	1.7%

Table 5: Number of antibiotics in prescriptions

ANTIBIOTICS	NO OF DRUGS
Pencillins	35
Cephalosporins	73
Macrolides	10
Aminoglycosides	19
Tetracyclines	4
Glycopeptide antibiotics	8

Table: 6 Distributions of Drugs According to Therapeutic Class in Total Prescriptions

FORMULATION	NUMBER	PERCENTAGE (%)
Iv	373	59.3 %
Tab	51	8.1 %
Syrup	104	16.6 %
Suspension	15	2.4 %
Suppositories	11	1.7 %
Nebulizer	53	8.4 %
Inhalation	9	1.5 %
Nasal drops	7	1.1 %
Ointment	6	0.9 %

Table 7: Average cost of prescriptions Brand Vs Generic (COST MINIMISATION ANALYSIS)

DISEASE	AVG COST OF GENERIC DRUG PRESCRIPTIONS (M±SE)	AVG COST OF BRAND DRUG PRESCRIPTIONS (M±SE)	P-VALUE
PNEUMONIA	171.25±4.32	783.16±41.87	--
SEIZURES	134.23±3.99	375.8±23.32	--
GE	71.33±2.67	249.0±13.87	--
FEVER	35.69±2.51	131.11±8.32	--
DIARRHOEA	60.13±5.43	169.32±18.63	--
ANEMIA	75.16±4.37	334.85±18.22	--
MALARIA	51.67±6.74	300.02±3. 9	--
JAUNDICE	263.44±2.84	431.48±34.50	--
DKA	352.88±0.00	476.68±0.00	--
TYPE1 DM	447±0.00	497±0.00	--
	MEAN=169. 27±47.2	MEAN=347.85±59.61	P-VALUE=0.015

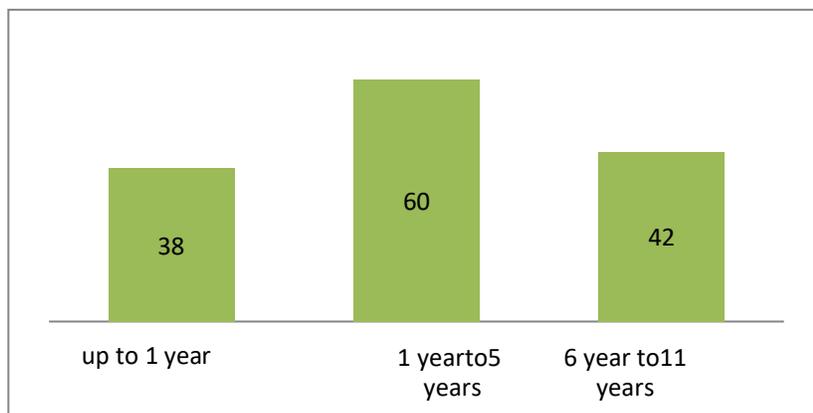


Fig1: Distribution of Patients According to various age groups:

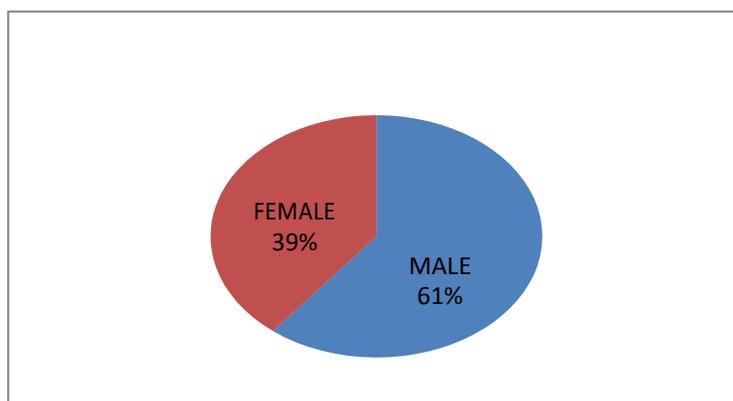


Fig 2: Distribution of Patients according to gender:

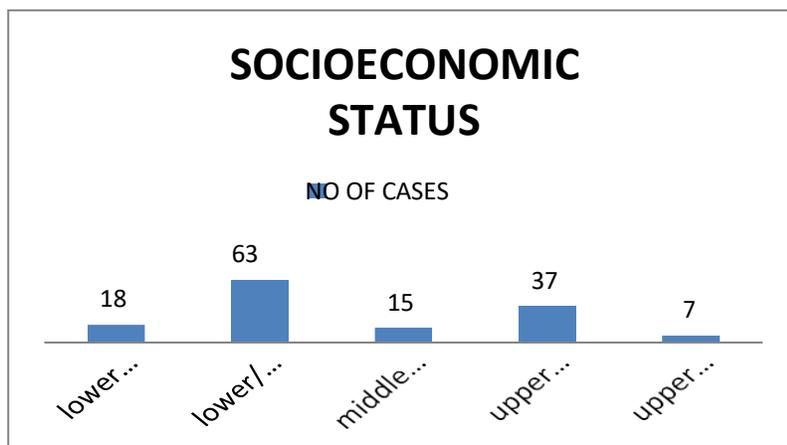


Fig 3: Socio-Economic Status of Gaurdians

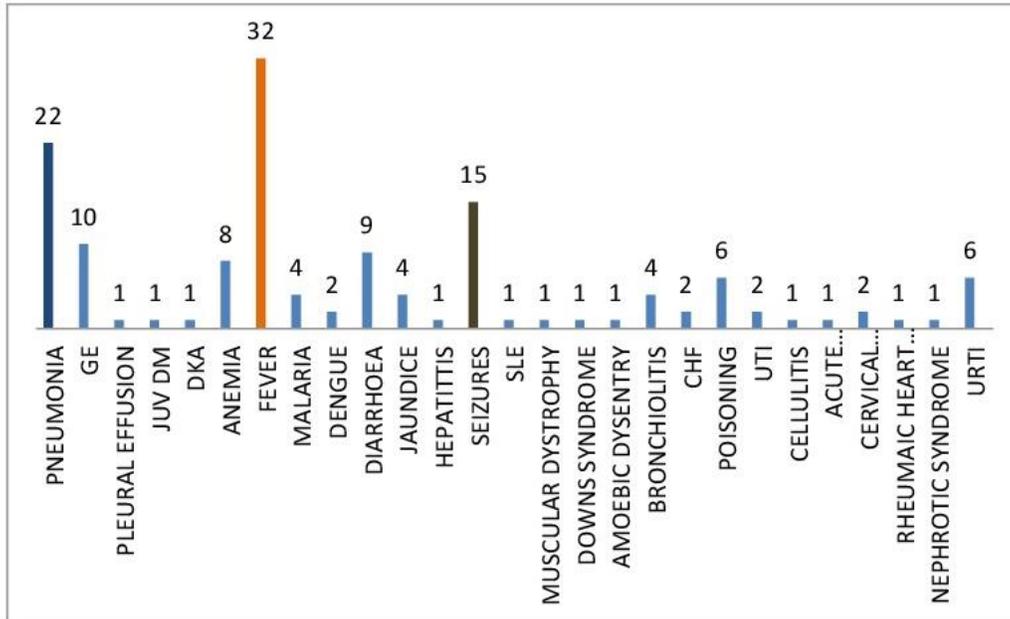


Fig 4: Distributions of Patients According to their Disease Condition.

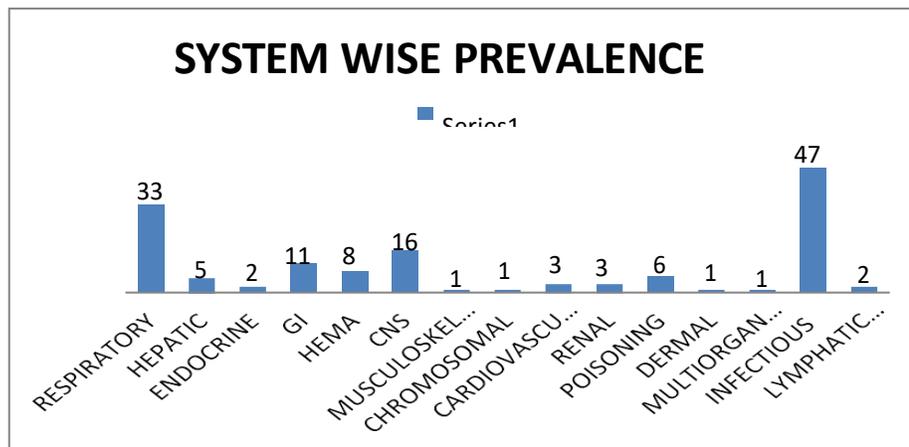


Fig 5: Distribution of Patients According to their system involvement

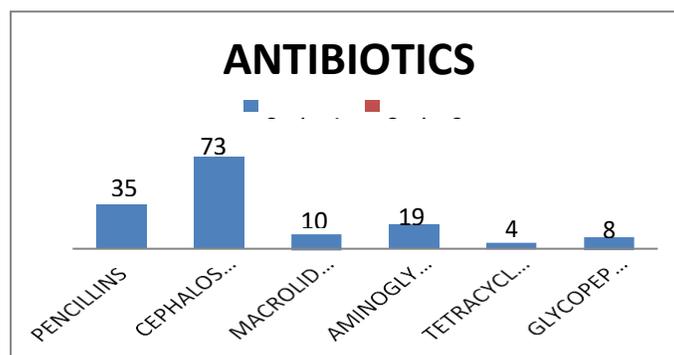


Fig 6: Number of antibiotics in prescriptions.

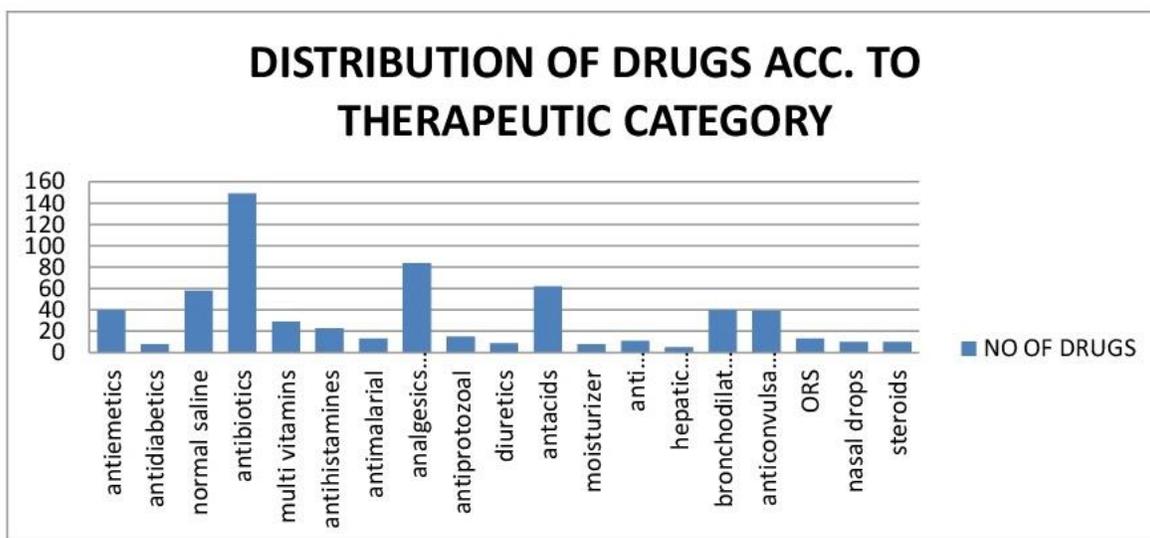


Figure 7 Distributions of Drugs According to Therapeutic Class in Total Prescriptions

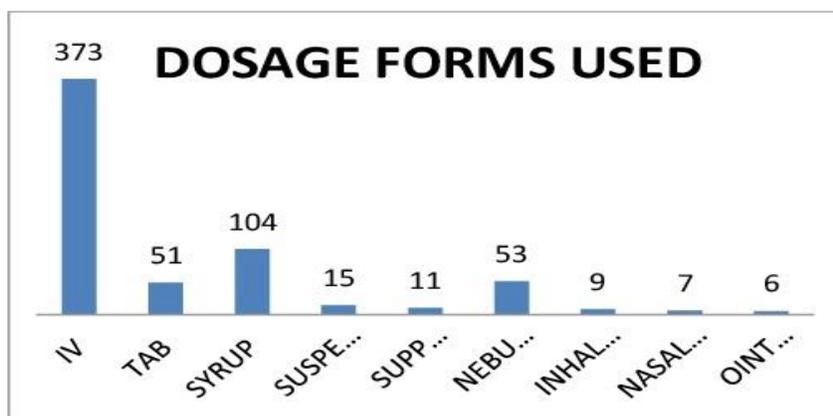


Figure 8 Dosage Forms In Prescriptions

DISCUSSION:

In our study the average number of drugs per prescription was 4.49 in 140 prescriptions which are comparable with previous studies by ShaktibalaDutta et.al and Kannan et.al [11] where average number of drugs per prescription was 3.98 and 4 respectively. It is observed in our study that most commonly prescribed antibiotics are cephalosporin's (49%), followed by penicillin's (23.5%) and very rarely used antibiotics were tetracycline's (2.6%) which is comparable with previous studies by Surendrag.gattani et.al (2009) [9] where use of amoxicillin (from 0 to 26.56%) is highest, followed by Aminoglycosides (1.56%). Most common illness in paediatrics in our study were respiratory diseases (bronchopneumonia, common cold, followed by

pleural effusion) which is comparable to previous studies worked out by SharonjeetKaur et al [12] where bronchopneumonia (33.3%) followed by bronchiolitis (17.5%) and bronchial asthma (7.9%) were reported. Among the total drugs prescribed, 40% were generic and 60% constituted branded drugs. Overall 51% of the total drugs prescribed were from the WHO List of Essential Medicine 2010. There should be more emphasis on prescribing generic drugs and in case of similar efficacy the drug with lesser cost should be preferred which is similar to the study of SharonjeetKaur, Kanchan Gupta et al[12] study hence they proved that generic drugs are less often prescribed than the branded drugs and usefulness of the generic drugs must be promoted. The cost of disease such as pneumonia as per generic

prescription costs about of 171.25 ± 4.32 , whereas the average cost of pneumonia per branded prescriptions account for 783.16 ± 41.87 and this promote the lowering of the healthcare costs especially for the economically background people. Distribution of Drugs According to Therapeutic Class in Total Prescriptions were analyzed, antibiotics are found to be most commonly used with 24% followed by analgesics and antipyretics 13.6% and hence our study shows the usage of antimicrobial agents are high when compared with the other agents which of applies cost minimization analysis to the both generic and branded antibiotics prescribed the cost difference varies from the 20% to 218% more than generic version which shows the similar results when compared with the study done by L.Ramesh et al[13].

CONCLUSION:

A total of 629 drugs were prescribed in 140 patients giving an average 4.49 drugs per prescription. In this study male children were found to be more affected by diseases than female children. Calculated average cost of generic and branded prescriptions shows 0.015 as significance which is less than 0.05, so P value significant. Generic are more cost effective than brand drugs. Respiratory diseases are more prominent in paediatrics next to infectious diseases. Most commonly used antibiotics are cephalosporins followed by Penicillin's, amino glycosides, and glycopeptides antibiotics. From our study it is observed that majority of patients admitted to tertiary care hospitals belongs to lower/upper poor families, hence our study suggests use of generic drugs. Our study suggests that there should be close monitoring over prescription pattern in paediatric population. It also highlights the need of rational use of drugs, prescribing by generics and from EDL. Continuing education regarding rational prescribing and developing easy guidelines for prescribing in common diseases in children is highly recommended.

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