A Multi-Centric Prospective Study on Prescribing And Sensitive Pattern of Antibiotics In Infectious Diseases

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Abstract-

Background*: Infection is a most commonly seen and is associated with increased morbidity and mortality. Antibiotics are the agents which are commonly used in the treatment of bacterial infections. Now-a-days resistance of antibiotics is increasing due to its inappropriate and indiscriminate use.*

Aim*: To assess prevalence, prescribing pattern of medications of infectious diseases and also to know the sensitivity pattern of Antibiotics.*

Materials and Method*: It is a multicentric cross sectional study conducted for a period of 6 months with sample size of 635 patients. A data collection form is taken which includes the details of demographics (name, age, sex, and social history), date of visit to the hospital, diagnosis, past and current medication history (medication details, dose, route, frequency, and duration). All the results are calculated using MS excel and graph pad software.*

Results*:In the study it was found that more no. of males(183) found in charity hospitals and more females (147) in private hospitals, samples advised commonly were blood cultures(153). where Amoxicillin/ clavulonic acid(39) is more prescribed combination in charity and public hospital and Cefoperazone / sulbactum(46) is more prescribed drug in private hospital. Ceftriaxone was more given to all age groups except 30-39 years age group where Amoxicillin/clavulonic acid is more given in that age group. Azithromycin shows higher resistance to Staphylococcus aureus.Amoxicillin, Ampicillin, Ceftazidime shows more resistance to staphylococcus epidermidis.Ciprofloxacin shows higher resistance to enterococcus faecalis.*

Conclusion*: There is need to encourage the physicians about generic prescribing educate about the polypharmacy, overuse of antibiotics in the hospitals. Our results serve as baseline data for further nationwide studies on the prescribing practices with the hope of applying effective interventions to reverse inappropriate use of drugs.Values higher than the standard are suggestive of polypharmacy which may increase the ADR, non-adherence and antibiotic microbial resistance.*

Keywords- Antibiotics, Resistant pattern,Polypharmacy, Cultures , Prescribing pattern.

I. INTRODUCTION

Infection is defined as invasion and multiplication of microbes such as bacteria, viruses, and parasites that are not normally present within the body. Microorganisms that live naturally in the body are not considered infections [1].Infection is a most commonly seen and is associated with increased morbidity and mortality. Antibiotics are the agents which are commonly used in the treatment of bacterial infections[2].Use of antibiotics in nonbacterial infections results in increase of resistance of microbes and the surfacing of antibiotic resistance usually results from the misuse of antibiotics as growth-promoters in animal production, for therapy and prophylaxis.

Resistance pattern of antibiotics may vary regionally. Now-a-days resistance of antibiotics is increasing due to its inappropriate and indiscriminate use. Culture specimen should be taken before treatment except in emergency and in critically ill patients. Patient history should be considered before prescribing a antibiotic. Causes of failure of antimicrobial agent may be due to resistance of microbe or failure to use the laboratory properly, wrong choice of antibiotics, inadequate duration of antibiotics and misuse of antibiotics and use of irrational antimicrobial fixed dose drug combinations [3,4].

Resistance of antibiotics can be obtained through naturally or acquired or transmissible or due to chromosomal mutation. Study about resistance of antibiotics will helps in

appropriate use of antibiotics and is helpful for the doctors to choose appropriate antibiotic [3].

Because of high level of community antimicrobial drug resistance, use of expensive drugs becomes mandatory which may not be affordable by majority of patients in developing countries like India [4].

Many of the drugs mainly second line and third line drugs acquired resistance. And as it is reported earlier, 'the slow pace with which new molecules of antimicrobials are introduced into the market is inadequate needs of the global threat[4].

As resistance is seen with second line and third line agents, physicians are prescribing drugs which are toxic, less effective and more expensive, and which results in more burden on patients [5]. To tackle with this problem, it requires the continuous education of physicians, nurses and pharmacists, which is supported by high quality evidence linking antimicrobial use to the emergence of resistance [6,7].

II. MATERIAL AND METHODS

Study Design: -

It is a multicentric cross sectional study carried out at Rural Development Hospital (RDT) Bathalapalli, Spandana (private hospital) ,Government (public hospital) Dharmavaram. This study included the data between the period of 6 months from August 2017 to January 2018.. Patients with following criteria were included in the study1) In-patients for whom antibiotics were prescribed at least once (prescription containing one or more antibiotics),2) Patients of both genders,3) Inpatients of medicine and pediatrics departments,4) Patients showing willingness to participate in the study.The following patients are excluded 1) Individuals showing unwillingness towards participation in the study,2) Prescriptions with no antibiotics,3) Patients who are suffering with HIV and Tuberculosis,4) Outpatients were also excluded as it is not convenient to make a regular follow up.

Data collection: -

Ethics clearance has been obtained from IEC prior to initiation of study patient who met with inclusion criteria were enrolled. The patient data was collected from OPD cards, Patient care notes, data from multiple patient visits were collected for all the patients.

Statistical Analysis: -

Statistical analysis was performed using Excel and graph pad. Categorical data are presented as Numbers.

III. RESULTS

Table-6.1: Age distribution

S.no.	Age (years)	No.		
		Charity hospital	Private hospital	Public hospital
1.	1-9	133	50	36
2.	10 19	81	19	12
3.	20-29	56	12	9
4.	>30	42	35	6

Table-6.1. Shows age distribution of three different hospitals, where high no. of population of all age groups is found at Charity hospital.

Table-6.2 : Gender Distribution

S. no.	Gender	No. of patients		
		Charity hospital	Private hospital	Public hospital
1.	Male	183	90	30
2.	Female	152	147	33
3.	Total	335	237	63

Table-6.2: Shows no. of age distribution of three different hospitals, where more no. of male population is found in charity hospital and female population is found more inPrivate and public hospital.

Table 6.3: Ward distribution of three hospitals

S. no.	Ward	No. of patients		
		Charity	Private	Public
1	Medical	115	148	20
2	Paediatric	220	89	43

Table-6.3: Shows ward distribution, where medical cases are more in Private hospital and paediatric cases are more in Charity hospital.

Table-6.4: Culture reports in different hospitals

S.no.	Culture reports	No. of reports	
		Charity hospital	Private hospital
1.	Blood	153	60
2.	Urine	59	57
3.	CSF	12	6
4.	Sputum	18	5
5.	Stool	26	26
6.	Pus	7	7
7	Throat swab	2	2
8.	Central line tip culture	4	4
9.	Pleural fluid culture	1	1

Table-6.4: Shows different type of culture reports in two hospitals, where blood culture is more advised.

Table:6.5. Frequency of diagnoses in three different health centres

DISEASES	CHARITY	PRIVATE	PUBLIC
Acute gasteroenteritis	14	18	2
Acute G.E with comorbidities	24	5	-
Sepsis	15	12	5
Sepsis with comorbidities	9	7	-
Bronchopneumonia	60	9	7
Bronchopneumonia with comorbidities	22	10	2
Dengue fever	32	15	7
Dengue with comorbidities	13	-	3
WALRTI with comorbities	1	8	-
WALRTI	22	9	4
Malaria	10	4	5
Malaria with comorbidities	9	3	3
LRTI	5	8	2
UTI	10	24	3
UTI with comorbidities	7	7	-
Meningitis	5	3	-
URTI	6	8	3
Pleural effusion	1	2	-
Meningioencephalities	8	2	-
Broncholities with comorbidities	5	6	-
Lower lobe consolidation	4	-	-
Viral fever	15	39	15
Scrub typhus	1	-	-
Viral fever with comorbidities	6	10	-
Rheumatic Heart Disease	3	-	-
Post diphtheric neuritis with bulbar palsy	1	-	-
Umbilical abscess	3	-	-
Rickettesial fever with rash	5	5	2
Hypothyroidism with rheumatoid arthritis with consolidation in left upper lobe	1	-	-
Tonsilitis with solitary thyroid goitre	1	2	-
Enteric fever with febrile seizures	7	3	-
Nephrotic syndrome	1	1	-
Right lung pneumonia with pancreatitis	2	-	-
Right minimal pleural effusion with Lt renal calculus with fatty liver	2	-	-
Seizures with HTN with hemiplagia with aspiration pneumonitis	1	-	-
Appendicitis with malentric lymphadenopathy	1	-	-
Cellulitis	1	1	-
Hepatitis	2	11	-

Table 6.5 . Shows diagnoses of charity ,private and public hospital where Bronchopneumonia was more frequent in charity hospital,fever was more frequent in private hospital and in government hospital viral fever & bronchopneumonia were more frequently seen.

Table-6.6: No. of treatment types in different hospitals

S. no.	Treatment type	No.		
		Charity hospital	Private hospital	Public hospital
1.	Definite treatment	235	98	0
2.	Empirical Treatment	100	139	63

Table-6.6: Shows no. of treatment types followed in three different hospitals

Table-6.7 Antibiotics Formulations

Formulations	Charity	Private	Public
Parenteral	347	63	122
Oral	113	132	50

Table-6.7. Shows different types of formulations used in three different hospitals, where parenteral formulation is more in Charity and Public hospital and oral formulation is more in Private hospital.

Table-6.8 Antibiotics vs Age distribution of three hospitals

S.no.	Drugs	Age distribution (years)				
		1-9	10-19	20-29	30-39	>40
1.	Ceftriaxone	65	45	27	11	30
2.	Sulfamethoxazole/Trimethoprim	2	2	-	-	-
3.	Fluconazole	2	-	-	-	-
4.	Vancomycin	5	10	7	2	-
s5.	Piperacillin/Tazobactam	12	7	8	5	4
6.	Doxycycline	4	7	14	9	10
7.	Amikacin	14	5	5	-	-
8.	Ampicillin	53	21	6	2	1
9.	Amoxicillin/Clavulonic Acid	41	29	11	13	20
10.	Gentamicin	62	18	4	1	2
11.	Cefotaxime	10	6	3	3	1
12.	Artesunate	-	4	4	-	2
13.	Primaquine	1	6	2	2	4
14.	Chloroquine	2	11	5	-	-
15.	Ciprofloxacin	3	1	3	2	2
16.	Metronidazole	1	4	-	-	8
17.	Cefixime	-	-	-	-	8
18.	Albendazole	-	2	8	-	-
19.	Artemether/Lumefantrine	2	3	-	4	-
20.	Nitrofurantoin	1	-	-	5	2
21.	Azithromycin	27	6	5	4	17
22	Cefuroxime	0	1	0	0	0
23	Cefepime	0	0	1	0	0
24	Cefepirome	0	0	0	0	1
25	Cefoperazone	0	0	0	1	0
26	Tobramycin	0	0	1	0	0

27	Streptomycin	0	1	0	0	0
28	Meropenem	5	4	2	3	2
29	Imipenem	0	0	1	1	0
30	Faropenem	0	1	1	0	0
31	Levofloxacin	3	2	0	1	2
32	Ofloxacin	1	2	0	2	1
33	Moxifloxacin	0	1	1	0	1
34	Tigecycline	0	1	0	0	0
35	Rifaximin	0	0	0	1	1
36	Colistin	0	0	1	0	0
37	Cefoperazone/Sulbactum	10	12	5	6	13
38	Cefepime/Tazobactam	1	2	1	0	0
39	Metronidazole	8	4	3	6	6
40	Teicoplanin	5	3	2	4	1
41	Linezolid	2	3	2	1	1
42	Clarithromycin	1	2	0	2	1
43	Ceftriaxone/Tazobactam	3	4	2	1	1
44	Clindamycin	0	1	1	0	0
45	Roxithromycin	1	0	0	0	0

Table-6.8: Shows that different types of antibiotics given to different ages of population where Ceftriaxone was more given to all age groups except 30-39 years age group where Amoxicillin/clavulonic acid is more given in that age group.

Table-6.9: Different classes of antibiotics given in three hospitals:

S .no.	Class of antibiotics	No. of antibiotics given		
		Charity hospital	Private hospital	Public hospital
1.	Cephalosporins	146	19	44
2.	Penicillins	137	8	65
3.	Fluroquinolones	6	19	6
4.	Aminoglycosides	84	12	17
5.	Antimalarials	44	-	14
6.	Macrolides	46	9	5
7.	Tetracyclines	26	8	6
8.	Sulfonamides	5	-	2
9.	carbapenems	-	19	-
10.	Others	28	-	7

Table-6.9: Shows different types of antibiotics given in three different hospitals, where drugs of cephalosporins class is more prescribed in charity hospital, in private hospital drugs of cephalosporins and carbapenems is more prescribed, in public hospital drugs of penicillins class is more prescribed.

Table-6.10: Combinations of Antibiotics of three hospitals

S.no.	Antibiotic combinations	No.		
		Charity	Private	Public
1.	Sulfamethoxazole/trimethoprim	6	3	6
2.	Artemether/lumefantrine	10	-	5
3.	Amoxicillin/ clavulonic acid	39	-	32
4.	Piperacillin/tazobactam	12	11	12
5.	Cefoperazone/sulbactum	-	46	-
6.	Cefipime/tazobactam	-	2	-
7.	Ceftriaxone/tazobactam	-	4	-

Table-6.10. Shows different types of combinations of Antibiotics, where Amoxicillin/ clavulonic acid is more prescribed combination in charity and public hospital and Cefoperazone / sulbactum is more prescribed drug in private hospital.

Table-6.11:Suspected organism vs No. of patients

S.no.	Organisms	Percentage prevalence (%)	
		Charity hospital	Private hospital
1.	E.coli	29.8	-
2.	Klebsiella pneumonia	14.9	-
3.	Pseudomonas	13.4	-
4.	Enterococcus faecium	19.4	34.6
5.	Staphylococcus aureus	10.4	30.7
6.	Staphylococcus coagulase negative	8.9	-
7.	Streptococcus pyogenes	2.9	-
8.	Staphylococcus epidermidis	-	19.2
9.	Enterococcus faecalis	-	15.3

Table-6.11. Shows no. of organisms found in charity hospital and private hospital, where more common organism found in this region is E.coli.

Table-6.12: Charity hospital (Antibiotics vs Sensitivity pattern)

S.no.	Antibiotics	No. of resistance	No. of susceptible	No. of intermediate
1.	Amoxicillin/ clavulonic acid	41	16	0
2.	Sulfamethoxazole/ trimethoprim	7	13	1
3.	Cefalotin/Cefadroxil	28	9	2
4.	Ampicillin	34	10	0
5.	Ceftriaxone/ Cefotaxime	22	15	9
6.	Cefoxitin	20	11	0
7.	Cefuroxime	21	12	2
8.	Ceftazidime	30	16	0
9.	Cefepime	31	20	0
10.	Piperacillin/tazobactam	8	16	0
11.	Ciprofloxacin	34	37	2
12.	Meropenem	9	39	5
13.	Gentamicin	17	44	9
14.	Clindamycin	6	15	0

15.	Doxycycline	5	22	4
16.	Penicillin G	18	16	1
17.	Azithromycin	10	3	1
18.	Nitrofurantoin	1	8	4
19.	Cloxacillin	9	10	0
20.	Chloramphenicol	10	40	0
21.	Sterptomycin	0	2	1
22.	Colistin	4	45	1
23.	Vancomycin	0	36	0
24.	Linezolid	0	14	0
25.	Astreonam	0	2	0
26.	Amikacin	28	36	0

Table-6.12. Shows sensitivity pattern of different types of Antibiotics of Public hospital, where Amoxicillin/clavulonic acid was found more resistant.

Table-6.13: Private hospital(Antibiotics vs Sensitivity pattern)

S.no.	Antibiotics	No. of Resistance	No. of Susceptible	No. of Intermediate
1.	Ceftazidime	21	3	-
2.	Cefepime	11	11	2
3.	Piperacillin/tazobactam	7	15	2
4.	Cefoperazone / salbactum	4	19	1
5.	Cefepime / tazobactum	1	-	-
6.	Imipenam	4	20	-
7.	Meropenem	4	20	-
8.	Doripenem	4	16	-
9.	Etrapenem	2	14	-
10.	Amikacin	3	19	1
11.	Gentamicin	16	13	1
12.	Ciprofloxacin	21	6	2
13.	Levofloxacin	21	4	1
14.	Norfloxacin	11	-	-
15.	Colistin	-	28	-
16.	Tigecycline	-	6	-
17.	Nitrofurantoin	6	3	-
18.	Tobramycin	1	2	-
19.	Benzyl penicillin	4	1	-
20.	Oxacillin	1	2	-
21.	Cefoxitin	2	1	-
22.	Erythromycin	1	2	-
23.	Clindamycin	1	3	-
24.	Tetracyclines	2	3	-
25.	Vancomycin	-	5	-
26.	Linezolid	-	5	-
27.	Teicoplanin	-	4	-
28.	Daptomycin	-	4	-
29.	Tigecycline	-	1	-
30.	Sulfamethoxazole/trimethoprim	2	1	-

Table-6.13 : Shows sensitivity pattern of different types of Antibiotics of Private hospital where Ceftazidime was found more resistant.

Table-6.14: Charity hospital (Antibiotic resistance vs micro organism)

S.no.	Antibiotics	E.coli	Klebsiella	Pseudomonas	Enterococcus	Staphylococcus	Streptococcus	Acinetobacter	Haemophilus influenza
1.	Colistin	0	2	0	0	0	0	0	0
2.	Chloramphenicol	2	5	0	0	2	0	2	0
3.	Cotrimoxazole	9	5	0	0	15	2	2	0
4.	Cephalotin/Cefadroxil	15	7	0	2	0	0	5	0
5.	Piperacillin	4	3	2	0	0	0	0	0
6.	Ciprofloxacin	18	6	0	10	10	0	0	0
7.	Meropenem	7	2	0	0	0	0	0	0
8.	Gentamicin	5	5	5	3	5	0	0	0
9.	Clindamycin	0	0	0	0	8	0	0	0
10.	Penicillin G	0	0	0	9	12	0	0	0
11.	Azithromycin	0	0	0	0	13	2	0	2
12.	Nitrofurantoin	4	2	0	0	0	0	0	0
13.	Cefepime	0	0	0	0	0	0	0	0
14.	Vancomycin	0	0	0	0	0	0	0	0
15.	Cloxacillin	0	0	0	0	10	0	0	0
16.	Ampicillin	23	11	0	3	0	0	2	0
17.	Amoxicillin	25	11	0	9	0	0	2	0
18.	Cefepime	22	7	3	2	0	0	0	0
19.	Doxycycline	0	0	0	6	2	0	0	0
20.	Streptomycin	0	0	0	0	0	0	0	0
21.	Linezolid	0	0	0	0	0	0	0	0

Table-6.14: Shows different types of antibiotics that were resistant towards microorganisms of charity hospital.

Table-6.15: Private hospital (Antibiotic resistance vs micro organisms)

S.no.	Antibiotics	Micro Organisms			
		Staphylococcus aureus	Staphylococcus epidermidis	Enterococcus faecium	Enterococcus Faecalis
1.	Colistin	0	2	0	6
2.	Chloramphenicol	2	5	0	2
3.	Cotrimoxazole	9	7	3	5
4.	Cephalotin/Cefadroxil	0	7	0	2
5.	Ampicillin	2	11	0	1
6.	Cefepime	0	7	3	2
7.	Piperacillin	0	3	2	0
8.	Ciprofloxacin	10	6	0	10
9.	Meropenem	8	2	2	1
10.	Gentamicin	5	5	0	3
11.	Amoxicillin	0	11	0	9
12.	Ceftriaxone/Cefotaxime	0	7	0	2
13.	Cefoxitin	0	4	0	2
14.	Cefuroxime	0	8	0	2
15.	Ceftazidime	0	11	4	2
16.	Clindamycin	8	5	2	1

17.	Doxycycline	2	6	0	6
18.	Penicillin G	12	10	2	9
19.	Azithromycin	13	3	2	5
20.	Nitrofurantoin	4	2	0	1
21.	Cefixime	9	0	0	4
22.	Linezolid	0	2	6	0
23.	Streptomycin	0	7	0	2
24.	Vancomycin	3	0	5	1
25.	Cloxacillin	2	0	6	0

Table-6.15. Shows different types of antibiotics that were resistant towards microorganisms of private hospital.Azithromycin shows higher resistance to Staphylococcus aureus.Amoxicillin, Ampicillin, Ceftazidime shows more resistance to staphylococcus epidermidis.Ciprofloxacin shows higher resistance to enterococcus faecalis.

Table-6.16. Prescribing pattern in three different hospitals

S.No	Prescribing indicator	Charity hospital	Private hospital	Public hosital	Standard
1.	Average number of drugs per encounter	4.08	1.8	3.2	1.6 – 1.8
2.	% drugs prescribed by generic name	94.1	0	100	100 %
3.	% encounters with an antibiotic prescribed	39.1	54.8	85	20 – 26.8 %
4.	% encounters with injections prescribed	35.9	43.7	60.3	13.4 - 24.1%
5.	% prescribed from essential drug list	98.3	90.2	41.08	100 %

Table-6.16: Shows prescribing pattern of three different hospitals, where average no. of drugs in private hospital and generic prescribing in public hospital only qualifies WHO standards.

Table 6.17: Prescribing pattern of antibiotics in three different hospitals

S .no.	Antibiotic prescribing indicators	Charity hospital	Private hospital	Public hospial	Standard
1.	No. of prescriptions	335	237	63	-
2.	No. of prescriptions with antibiotics	335	237	63	-
3.	Average no. of antibiotics / prescription	1.59	1.02	2.73	1.6-1.8
4.	% prescription with antibiotics	100	100	100	-
5.	% of antibiotics from all drugs	30.5	17.7	12.5	20-26.8 %
6.	% of antibiotics in generic name	79.7	0	100	100 %
7.	% of injectable antibiotics	78.6	13.2	70	13.4-24.1 %

Table 6.17: Shows prescribing pattern of antibiotics in three different hospitals, where generic prescribing of antibiotics in public hospital only qualifies the WHO standards.

IV. DISCUSSION

The main objective of this study is to determine prescribing pattern in various infectious diseases ,their prevalence and sensitivity pattern of different antibiotics. A prescription provides an insight into a prescriber's attitude to the disease being treated and the nature of health care delivery system in the community [8].The study was done in three different hospitals namely RDT [Charity] in Bathalapalli, Spandana [Private] and Government (Public) hospital in Dharmavaram.

Antibiotics represent most commonly used drugs[9]. The majority of common childhood illnesses are caused by viruses which do not require antibiotics so excessive and inappropriate use leads to a no. of consequences in term of cost, drug interactions, hospital stay and bacterial resistance[10].

Our study conducted in charity hospital, assessing of prescribing patterns showed that only generic drugs is near to standard value and drugs prescribed from Essential Drug List are almost near to standard value. Study conducted in Private hospital, showed that only average no. of drugs per encounter is in standard value and drugs prescribed from EDL is near to standard value and the study conducted in public hospital, showed only generic drugs is in standard value.

A study conducted in 4 different countries ,the average no. of drugs prescribed per encounter are, Nigeria (3.9)[11],Rohtak [India] (2.74) [12] and in our study average no.of drugs per encounter are charity (4.08), private (1.86) and public (3.2).

Whereas the percentage of generic drugs prescribed in Kathmandu is 41 %[13] and in Jimma 82% [14] and in our study percentage of generic drugs prescribed in charity (94.1 %), private (0), public(100 %).

Percentage of antibiotics prescribed in Nigeria [75%] [11], Rohtak [85%] [15] and in our study percentage of antibiotics prescribed in Charity(39.1%), private(54.8%), public(85%). The proportion of antibiotic prescription was 48.3 % in a study conducted in Northern Ethiopia[15]. High prevalence of antibiotic use could be due to noscomial infections which commonly develop after a prolonged hospital stay [15].

In our study the most commonly prescribed antibiotics in all age groups were Ceftriaxone and Cefoperazone/Sulbactam. In a study conducted in Northern Ethiopia, most commonly prescribed antibiotics in all age groups were Penicillins, Cephalosporins and Macrolides [15].

Percentage of injections prescribed in Nigeria [53%] [16], Rohtak [54%] [17]and in our study percentage of injections prescribed in Charity(35.1%), private(43.7%), public(60.3%). Essential Drug List is taken from National List of Essential Medicines. Percentage of drugs prescribed from EDL in charity hospital was [98.3%], in private hospital [90.2] and in public hospital [41.08%]. When compared to a study conducted in Northern Ethiopia is 95.2% [15].

A study conducted in Yemen, also showed that the prescribing pattern in one of the hospital in Yemen not qualifies the standards of WHO [18].

In our study the most common route of administration was parenteral route in charity hospital [75.4 %] and in public hospital [70.9%]. In private hospital most common route of administration was oral route [32.3 %]. In a study conducted in Jimma, where the common route was oral route [52.9 %] and parenteral route was [13.4%][14].

Coming to sensitivity pattern in charity hospital, antibiotics resistant to organisms include Amoxicillin, Cefalotin/ cefadroxil, Ampicillin, Gentamicin. In private, Ceftazidime, Ciprofloxacin, Norfloxacin, Levofloxacin are found to be resistant .In public hospital, no culture sensitivity pattern done .Studies conducted by Goel et al. [19] showed that a very high rate of resistance (80-100 %) was observed among predominant Gram negative bacilli to Ciprofloxacin, Ceftazidime , Sulfamethoxazole/ trimethoprim and Amoxicillin/clavulonic acid combination.

Most common organisms seen in charity hospital are Escherichia coli, Klebsiella, Psudomonas, Enterococcus faecium, Staphylococcus aureus, Acinetobacter species, Haemophilus influenza, Streptococcus pyogenes. In Private hospital, most seen organisms were Enterococcus faecium, Enterococcus succulis, Staphylococcus epidermidis, Staphylococcus aureus and in public hospital, no culture sensitivity pattern was done and high percentage of microbe found was E.coli noted in charity hospital [29.8%], in private hospital, Enterococcus faecium [34.6 %].

A study conducted in private hospitals of south India, common organisms found to be E.coli, Klebsiella, S.pneumonia, Pseudomonas, S.aureus, S.pyogenes, Citrobacter, Acinetobacter, Streptococcus epidermidis, Proteus, Enterobacter, where high percentage seen in E.coli [36.4%] [3].

In charity hospital bronchopneumonia is more seen, in private hospital more seen is fever, in public hospital more seen is viral fever and bronchopneumonia. A study conducted in private hospital in south India, showed more cases of lower respiratory tract infections and more common found organism is E.Coli[3].

In our study conducted in charity hospital Cephalosporins [27.9%], Private hospital Cepalosporins and Carbapenems [20.2 %] and public hospital Penicillins [39.1 %] were commonly preferred drugs, whereas study conducted by Ranjita kumara *et al*. at public health facilities of Lucknow, beta lactam antimicrobials[35.09%] and fluoroquinolones [18.88%] were commonly preffered drugs[20].

V. CONCLUSION

On the basis of findings of this study, the percentage of generic names is below half of the WHO standard value(100%) in Charity hospital and no generic prescribing is followed in private hospital. So, there is need to encourage the physicians about generic prescribing.This study has documented polypharmacy, overuse of antibiotics in three hospitals. Prescriptions with injections is totally out of the recommended values in three hospitals. There is need to encourage the drugs to give from EDL in public hospital as it is lower in public hospital. Multicentric prospective studies with a large size in various prescribing setup will give us better insight regarding prescription writing practices. Our results serve as baseline data for further nationwide studies on the prescribing practices with the hope of applying effective interventions to reverse inappropriate use of drugs.Values higher than the standard are suggestive of polypharmacy which may increase the ADR, non-adherence and antibiotic microbial resistance.

VI. CONFLICT OF INTEREST

The authors have no conflicts of interest regarding this investigation.

VII. ACKNOWLEDGEMENT

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VIII. DISCLOSURE

The authors report no conflicts of interest in this work.

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