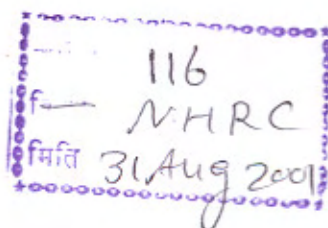


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PRACTICE OF USE OF ANTIBIOTICS IN GOVERNMENT
HOSPITALS AND PRIVATE CLINICS OF KATHMANDU
VALLEY: A PROSPECTIVE STUDY



By

Miss Archana Pokharel

Miss Nami Palikhe

Miss Nilima Shrestha

SUBMITTED TO
Nepal Health Research Council
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EXECUTIVE SUMMARY

Objective

The specific objectives of this project were to study

- *On the different types of antibiotics used by the different specialists (Surgeons, Physicians, Pediatrician, Gynecologists.*
- *The use of antibiotics with the laboratory investigation by the specialists*
- *The use of antibiotics with the Culture sensitivity analysis.*
- *Percentage of antibiotics prescribed in generics.*
- *On the use of priority drugs or essential list drugs by the specialist*
- *The use of unnecessary and needlessly expensive drugs by the specialists*
- *The cost of therapy with antibiotics only*
- *The total cost of therapy including both antibiotics and other drugs*
- *The average number of drugs being prescribed per prescription*
- *The health related problems according to age and sex*
- *Mostly prescribed antibiotics by different specialists*
- *The difference in prescribing practice in the hospital and clinic*
- *The awareness of the people on the use of antibiotics*

Methodology

The study included the prescription of only four specialties i.e. surgeon, physician, pediatrician, gynecologist from the government hospital and private clinics of Kathmandu valley. Among the government hospital, Bir Hospital, Teaching Hospital, Prasuti Griha (Maternity Hospital), T.U Kanti Children Hospital were purposefully selected while selection of private clinics was done randomly. The selection of private clinic was done among the existing clinics of different specialist to make five clinics of each speciality. The study included the use of encounters for the collection of data on the mentioned specialities. Fifty encounters receiving antibiotics will be made from each clinic and the selected hospital. The interviewing method was applied to study the awareness of the people on the use of antibiotics. Then the collected data were coded and analysed. The total numbers of encounters made were 386.

Results

- *the average number of drugs prescribed by Pediatrician was minimum in Hospital. The average number of drugs prescribed was found to be maximum in clinic by gynaecologist.*
- *physician from hospital prescribed the maximum number of Essential drug while minimum percentage of Essential drugs were prescribed by Pediatrician clinics. The practice of prescribing drugs in generic by Paediatrician was nil.*
- *the use of unnecessary, needlessly expensive drug, cough syrup was prescribed by the Pediatrician of Clinic. The surgeon from hospital prescribed the drug more in generic.*
- *there was a significant difference in prescribing Essential drugs between hospital and clinic of Physician at 1% level of significance. But there was no significant difference in prescribing Essential drugs between hospital and clinic of other specialities.*
- *in hospital 40.5 % percentage of antibiotic were prescribed with diagnosis while in clinic 20.25 % of patients received antibiotic. The maximum numbers of patients who received antibiotic by diagnosis were gynaecological patients from hospital. Only 8% of medical patient visiting clinic received antibiotics by diagnosis.*
- *the difference between the proportion of encounter receiving antibiotic in hospital and clinic is significantly different at 1 % level of significance.*
- *the maximum number of gynaecological patients received antibiotics for STD in hospital and for PLA in clinic.*
- *the maximum number of patients receives antibiotics from physician for fever and cough in both hospital and clinics.*
- *the maximum number of patients received the antibiotic for infection, pain and inflammation in both hospital and clinic from surgeon.*
- *the paediatric patients with the problem of fever, cough and vomit received the maximum number of antibiotics in both hospital and clinics.*
- *Amoxicillin was prescribed maximum by Physician of hospital and Ciprofloxacin by Physician of clinic.*
- *Ampi+ Cloxa and Cloxacillin were prescribed mostly by Surgeon of hospital. Mostly gynaecologist of hospital prescribed doxycycline and combination of two antibiotics.*

- *Penicillin group of antibiotics were mostly used in hospital. Quinolones and Fluroquinolones were prescribed in maximum amount in Clinics.*
- *the practice of prescribing the antibiotics without investigation was more in both hospital and clinics. The difference in prescribing the antibiotic with C/S and others investigations in hospital and clinic was not significantly different at 1% level of significant.*
- *minimum people are aware on the use, consequences, and method of administration and contraindication of antibiotics.*
- *About 54% of responded were unaware of antibiotics.*
- *Only 8.11% of patient had correct knowledge of antibiotics.*
- *49% of patient received antibiotics without prescription from a doctor.*
- *43.14% could not responded only 6% had good responses about the method of administration in the use of antibiotics.*
- *31% were unaware and 58% had little knowledge but none of them had adequate knowledge about the consequences for the wrong use of antibiotics.*
- *the majority of patients were unaware on the contraindication of antibiotics i.e. (65%) and none had an adequate knowledge.*

CHAPTER I

INTRODUCTION

Background

It is the hard reality and paradoxical in itself that with each progressive steps in the advancement of science and technology, the life of individual being insecured by incoming of new challenging diseases each year. Researchers, scientists are giving their optimum attempts to surmount the threats from newly born disease and known to achieve victory time to time but this type of achievement wouldn't stop the disease causing organisms rather they seem to invade in more powerful forms.

Infectious disease remains the world's leading cause of death ranges from those occurring in tropical areas (such as malaria and Dengue Hemorrhage fever, which are most common in developing countries) to disease found worldwide (such as hepatitis and sexually transmitted disease including HIV/AIDS). According to world health report, the impact of infectious diseases on human health has been tremendous and fatal.

The discovery of antibiotics and vaccines led to belief that infectious disease could be reduced to some extent that they would no longer pose a public health problem. Unfortunately these expectations have proved wrong. Today infectious diseases remain the leading cause of death worldwide.

In such instances, developing resistance capacity of organism to antibiotics is posing a threat and is necessitating rendering maximum concern over it. In fact in developing country like Nepal, it is serious matter for every individual to ponder.

In this respect different INGO's, NGO's are carrying out their best effort in alleviating the problems. Some of these are APUA, which is INGO, and also some of NGO's like INRUD, PHON, and RECPHEC are working for the rational use of drug.

Although the clinicians are doing the best to get rid of the possible hazards and associated iatrogenic problems with the consumption of drugs, the problems have not reserved yet. In addition, lack of awareness among people using antibiotics is imparting an equal problem.

So this type of condition strongly urges to every concerned authorities to take an immediate action and necessary steps to disseminate the awareness of antibiotics in every nook and cranny as possible.

Literature Survey

According to Drug Act 1978, section 17, the drugs are classified into three categories viz ka, kha and ga in which antibiotic are included in-group kha.

Proper use of antibiotic has become a global concern. So realizing the need of national policy on use of antibiotics a paper was presented by DDA at regional drug information workshop held at Nepalgunj and Pokhara in 1999. Both the workshops recommended for the formulation of national antibiotic policy. Thus it was forwarded to HMG ministry of health to formulate the policy.

The study in relation to use of antibiotics has been conducted in different national and international levels. The following are the information found in their respective studies. This information was collected based on studies conducted and published by International Network for Rational Use of Drugs. (INRUD, Nepal) and Pharmaceutical Horizon of Nepal (PHON). It also includes studies published by others.

- 88% of encounters from outpatient department of a hospital in Kathmandu have received one or more antibiotics. The antibiotic use has been 40 % in one of four study hospitals.
- 98% of in-patient children in Kathmandu has received one or more antibiotics
- 99% of operated patients and 76% of the non-operated patients from surgical ward of hospital have received one or more antibiotics. 83% have received antibiotics without any microbiological investigation.
- 22% of patients from surgical ward of a hospital have received prophylactic antibiotics
- 80% of encounters from private doctors' clinics/ nursing homes in Kathmandu have received one or more antibiotics 21% of them have received Fluoroquinolones.
- 38% of households have antibiotics stock but only 17% of them correct knowledge of using them.

According to the study conducted by Keith.W.Johnson, the following findings were obtained. The six target countries selected were Ghana, Mozambique, Nepal, Peru, Russia, Zambia. The key findings were:

- Objective information sources were generally limited and not effectively used

- Locally specific information was generally not available (except from industry or practice guidelines)
- Information and proper indication, dosage (including length of treatment), precaution and side effects- including information on antimicrobials resistance issues was typically lacking in the countries surveyed.
- Drug information centers did not reach their potential for information dissemination.

Problem statement

Antimicrobial drugs, as classes are one of the most frequently used drugs as well as misused drugs. In the developing country like Nepal where most of the infectious disease predominates, its importance has been magnified so the proper use of this type of drug has to become a common theme for every mass of individual and, indeed, number of works has already been attempted in furtherance for its public awareness and interest as well. But still this drug, which has remained hope for millions of people to treat most of the infectious disease, is known to be in the verge of tremendous misuse. It can be either due to the lack of awareness in the person using antibiotics or by the less concern of our governing bodies while prescribing it. Furthermore this may result in the increased resistance capacity of the organisms for these classes of drug. If this type of situation is about to persist longer then the health of the people will no doubt be put in great danger.

CHAPTER 2

OBJECTIVE OF THE STUDY

General

The general objective of this project was to study the present prescribing practice and the use of antibiotics in different government hospitals and private clinic within the Kathmandu Valley. Furthermore, the other objective was to study the awareness on the use of antibiotics among people visiting hospital and clinics.

Specific

The specific objectives of this project are to study

- the different types of antibiotics used by the different specialists(Surgeons, Physicians, Pediatrician, Gynecologists)
- the use of antibiotics with the laboratory investigation by the specialists
- the use of antibiotics with the culture sensitivity test
- percentage of antibiotics prescribed in generics
- on the use of priority drugs or essential list drugs by the specialist
- the use of unnecessary and needlessly expensive drugs by the specialists
- the cost of therapy with antibiotics only
- the total cost of therapy including both antibiotics and other drugs
- the average number of drugs being prescribed per prescription
- the health related problems according to age and sex
- mostly prescribed antibiotics by different specialists
- the difference in prescribing practice in the hospital and clinic
- the awareness of the people on the use of antibiotics

CHAPTER III

SIGNIFICANCE OF THE STUDY

The findings of the study will be helpful in channelising a proper usage of antibiotics from every level of health aspects. Similarly the study will be helpful in giving us the information on the present situation of the people having knowledge in the use of antibiotics so that effective information and education system can be implemented to make people more aware for its use. This study will be beneficial to the

- Prescriber
- Dispenser
- General public
- Researchers
- Design intervention to uplift the knowledge of consumer

CHAPTER IV

METHODOLOGY

1. Exclusion criteria:

The following things are precluded for our study

- 1.the other specialities like dermatology, ophthalmology, orthopedics etc.
- 2.the in-patient encounters from hospital and private clinics
- 3.the follow up patients from the hospital and private clinics.

2. Inclusion criteria:

1. The OPD (out patient department) patients from the specialities of the surgery, gynecology, pediatrics and medical only.
2. The study was done under chosen hospital and private clinics of Kathmandu valley only.
3. The study was done with the prescription containing antibiotics only.

3. Overall approach and study design

The study was analytical and assessed the prescribing practices of the prescribers from hospital and private clinics using encounter methods while assessment of awareness of people sing antibiotics was done by interview method.

3. Study area selection

The study had purposefully selected **four** government hospital viz. Bir Hospital, Teaching Hospital, Kanti Children Hospital and Prasuti Griha (maternity hospital). The study had randomly selected twenty private clinics to make five of each speciality (surgery, pediatrics, gynecology and medical). Lottery method was used while doing a random sampling of private clinics.

4. Data Size

Fifty encounters receiving antibiotics was made each sampled clinic and the selected hospital of the chosen prescriber. The total number of encounters including both hospital and clinic made were 386.

5. Data Collection Tools

The study adopted the indicators developed by WHO/ International Network For Rational Use of Drug (INRUD). The data were collected on the prescribed format (Refer annex-1). The study also had the questionnaire which was prepared for each of the encounter.

6. Field Test

The field test of the data collection tools (Instrument) was done in Dhulikhel Hospital and one of the clinics from Lalitpur district.

7. Data Collection Method

The data were collected from each encounter of the out patient department of each of the four specialities by using standard encounter form. A direct interview method was used for the questionnaire.

8. Data Analysis

Coding

The data were coded using the following techniques.

I) Age: Below 1, 1-12, 13-20, 21-40, 41-60 and >60.

II) Sex: Male and female

III) Prescribed Drugs were coded in their respective columns either by using 0 for (No) or 1 for (Yes). They are

- Whether the prescribed drug fall under the essential drug list of Nepal.
- Whether the prescribed drug was injectable preparation
- Whether the prescribed drug was in generic name
- Whether the prescribed drug was needlessly expensive and unnecessary
- Whether the prescribed drug falls under the alternative medicine category.

IV) Prescribed drugs were coded as essential drugs, needlessly expensive drugs, unnecessary drugs and alternative medicine. (Refer Annex)

Essential list drugs have been defined as the drugs categorized for different level of health facilities in the Essential Drugs List of Nepal.

Needlessly Expensive Drugs have been defined as the which are expensive but having little therapeutic benefits.

Unnecessary Drugs have been defined as the drugs, which are not necessary or useful.

Alternative System of medicine have been defined as the drugs apart from allopathic like ayurvedic drugs.

V) Health problem observed in the encounter from each of the four specialites were also coded. (Refer Annex)

VI) The total number of drug prescription and the cost of therapy were also noted by using SIMS/MIMS/DRUG INDEX.

Data Tabulation

The collected data were tabulated by using tally bars and Excel in computer.

Data Analysis

The data were analysed by using facility of MS Excel of computer. Data analysis included the calculation of percentage and calculation of average. The data obtained for antibiotics prescribed with investigation and antibiotics prescribed with diagnosis were analysed statistically using Z test at 1% level of significance. The analysed data are presented in the table form and graph form as well.

CHAPTER V

RESULTS

5.1 Age group of patient

The study showed that maximum number of patients receiving Antibiotics falls under the age of 21-40.

Table I: Age group of patient for both Hospital and Clinic

Speciality(%) Age	>1	1-12	13-20	21-40	41-60	>60
Gyane (n_1)*	0	0	6	66	12	16
Paed (n_2)*	8	88	4	0	0	0
Surgeon (n_3)*	0	10.46	17.44	43	5.81	23.25
Physician (n_4)*	0	0	12	52	28	8

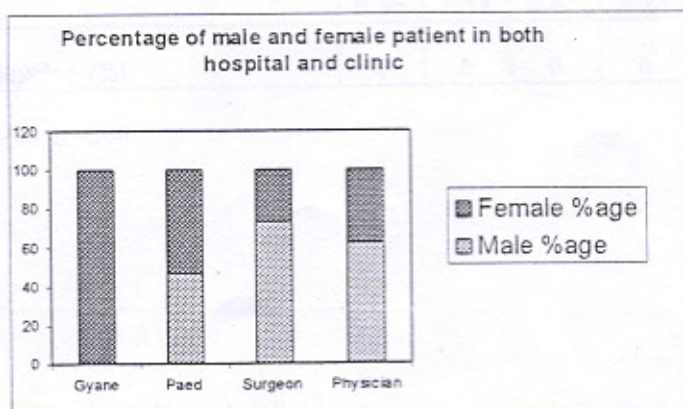
* $n_1=100$, $n_2=100$, $n_3=86$, $n_4=100$

5.2 Patient by sex

The study showed that the percentage of male patient receiving antibiotic was highest in surgery (73%).

Table II Patient by sex for both hospital and clinic

Speciality	Male percentage	Female %
Gyane	0	100
Paed	47	53
Surgeon	73	27
Physician	62	38



5.3 Drug use situation

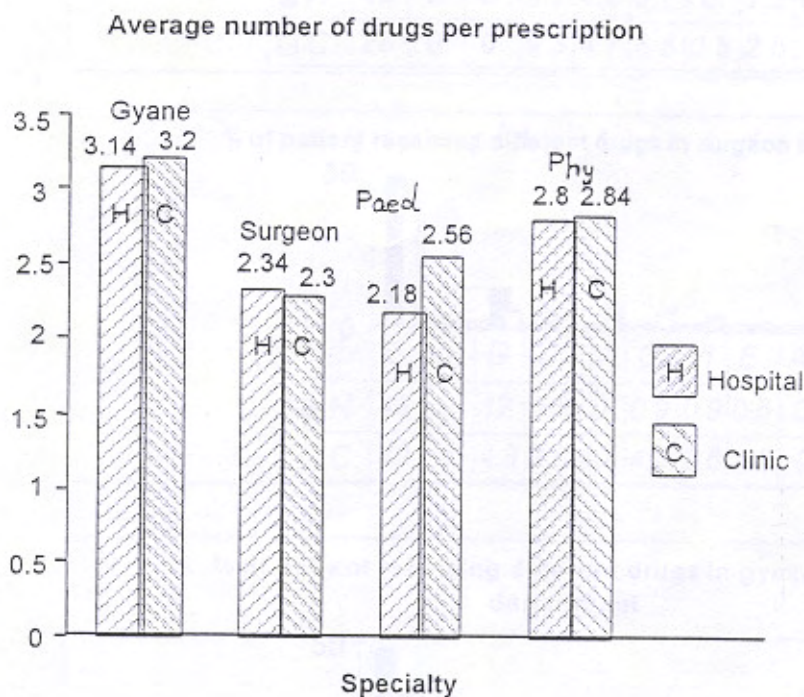
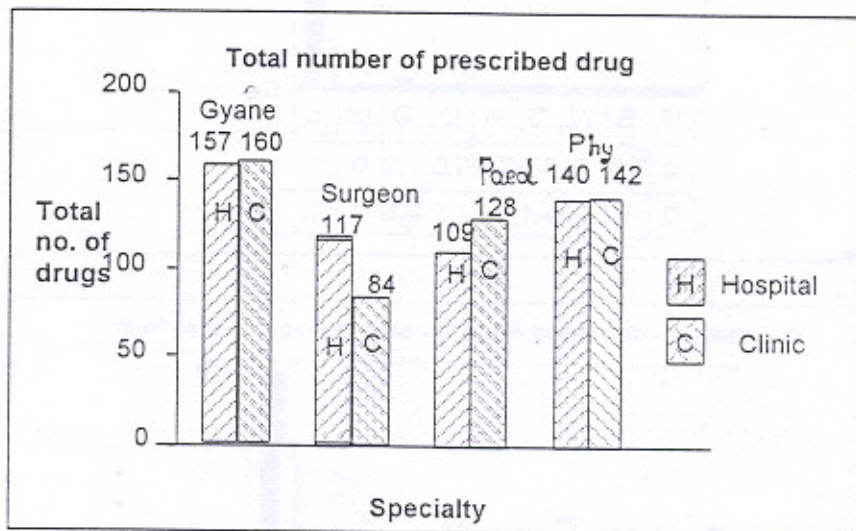
The study showed the minimum number of average drugs was prescribed by Paediatrician in Hospital. The average number of drugs prescribed was found to be maximum in clinic by gynaecologist. Physician from hospital prescribed the maximum number of Essential drug while minimum percentage of Essential drugs were prescribed by Pediatrician clinics. The practice of prescribing drugs in generic by Paediatrician was nil. The use of unnecessary, needlessly expensive drug, cough syrup was prescribed by the Pediatrician of Clinic. The surgeon from hospital prescribed the drug more in generic.

There was a significant difference in prescribing Essential drugs between hospital and clinic of Physician at 1% level of significance. But there was no significant difference in prescribing Essential drugs between hospital and clinic of other specialities.

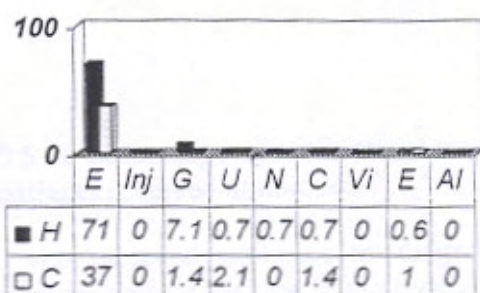
Table III Drug use situation in health facilities

S.No		Gyane n_1^*		Surgeon n_2^*		Paed n_3^*		Physician n_4^*	
		H	C	H	C	H	C	H	C
1	Total number of prescribed drug	157	160	117	84	109	128	140	142
2	Average number of drugs per prescription	3.14	3.2	2.34	2.33	2.18	2.56	2.8	2.84
3	Essential drugs (%)	47.13	32.5	47.86	40.47	47.7	28.12	70.7	37.32
4	Injection (%)	0	0.6	0	0	0	0	0	0
5	Generic (%)	4.45	5	11.96	4.76	0	0	7.1	1.4
6	Unnecessary drug (%)	1.27	3.12	0.8	3.57	3.66	9.3	0.71	2.11
7	Needlessly expensive drug (%)	0.63	1.25	0	4.76	4.57	4.68	0.71	0
8	Cough Syrup (%)	0.63	3.12	0.85	4.76	3.66	8.59	0.71	1.4
9	Vitamin (%)	0.63	1.87	0.85	3.57	0	0.78	0	0
10	Enzyme (%)	0.56	1.34	0.45	1.23	1.34	2.45	0.56	0.98
11	Alternative medicine (%)	0	0	0	0	6.25	0	0	0

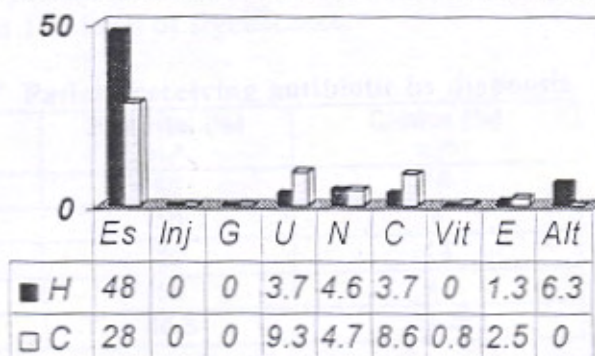
* $n_1=100$, $n_2=100$, $n_3=86$, $n_4=100$



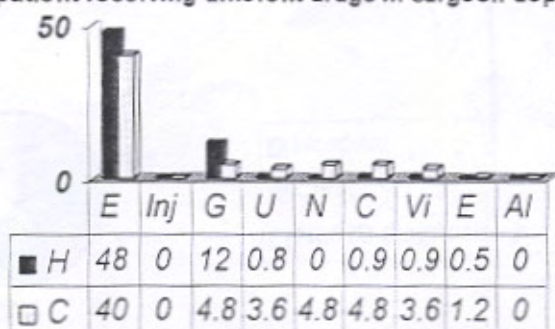
% of patient receiving different drugs in physician department



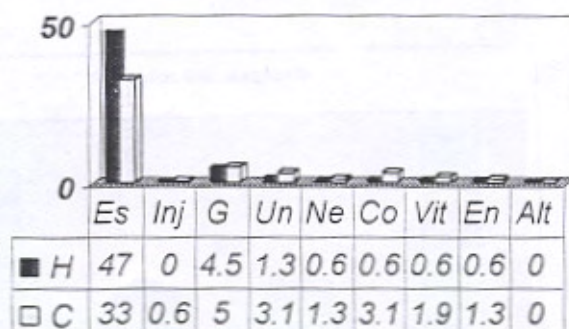
% of patient receiving different drugs in Paediatric department



% of patient receiving different drugs in surgeon department



% of patient receiving different drugs in gynaecology department



5.4 Diagnosis

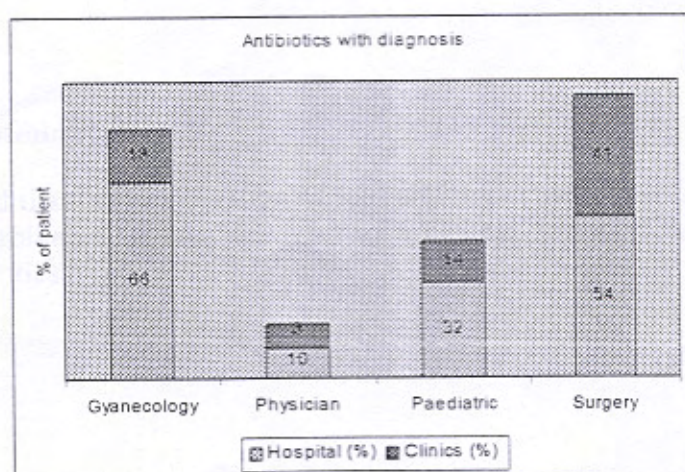
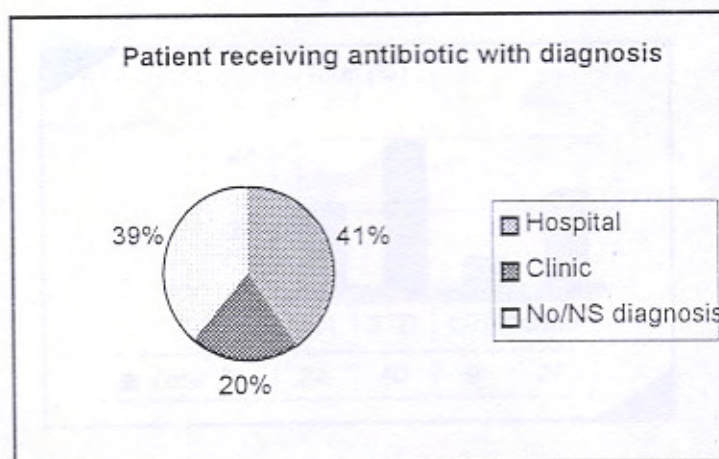
The study showed that in hospital 40.5 % percentage of antibiotic were prescribed with diagnosis while in clinic 20.25 % of patients received antibiotic.

The maximum numbers of patients who received antibiotic by diagnosis were gynae patients from hospital. Only 8% of medical patient visiting clinic received antibiotics by diagnosis.

The difference between the proportion of encounter receiving antibiotic in hospital and clinic is significantly different at 1 % level of significance.

Table IV Patient receiving antibiotic by diagnosis

Speciality	Hospital (%) n_1^*	Clinics (%) n_2^*
Gyanecology	66	18
Physician	10	8
Paediatric	32	14
Surgery	54	41
Total	40.5	20.25



5.5 Gynaecology

5.5.1 Health Problem

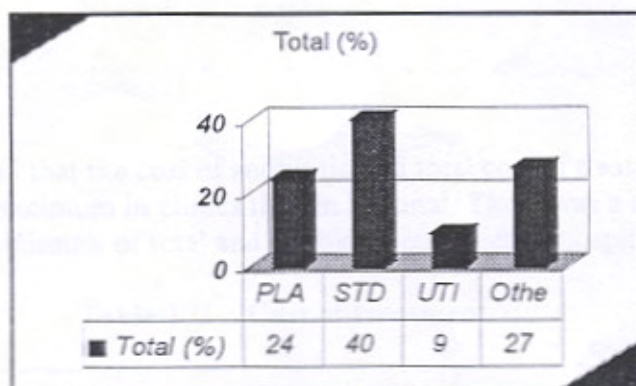
The maximum number of patient received the antibiotic for STD in hospital and for PLA in clinic.

TableV Health problem of patient receiving Antibiotics

Type of health problem	Hospital (%) n_1^*	Clinic (%) n_2^*	Total (%)
PLA	8	40	24
STD	70	10	40
UTI	10	8	9
Others	12	42	27

$n_1^*=50, n_2^*=50$

Others: dymenorrhoea, amenorrhoea, burning micturation, respiratory problem, fever, loin pain, breast pain, abortion etc.



5.5.2 Types of antibiotic used

The result showed that the combination of two antibiotics were prescribed maximum for gynaecological problems in hospital whereas in clinic variation was observed while prescribing antibiotics.

Table-VI Types of Antibiotics used in Gyanecology

Health Problem	Antibiotics %											
	Hospital n ₁ *	Cephalo	Amoxy	Cloxa	Ampi+Cloxa	Cipro	Erythro	Doxy	Ofloxa	Norflox	Two Abs.	Others
PLA		0	25	0	0	25	0	25	0	0	25	0
STD		0	2.8	0	5.7	5.7	0	26	0	0	60	0
UTI		0	0	0	0	20	0	40	0	0	40	0
Others*		0	0	0	16.66	0	0	17	0	0	66.66	0
Clinics n ₂ *												
PLA		0	20	10	10	15	0	20	5	15	5	0
STD		40	0	0	40	0	0	0	0	0	20	0
UTI		0	0	0	0	0	0	0	0	100	0	0
Others*		4.76	42.85	0	4.76	19	0	9.5	4.76	14.28	0	0

n₁*=50, n₂*=50

Others*: dymenorrhoea, amenorrhoea, burning micturation, fever, loin pain, breast pain, and abortion.

5.5.3 Cost

The result showed that the cost of antibiotic and total cost of treatment for all health problems were maximum in clinics than in hospital. There was a difference between maximum and minimum of total and antibiotic cost both in hospital and clinic.

Table VII Cost of treatment

Health Problem	Antibiotic cost (Rs.)			Total cost (Rs.)			
	Hospital n ₁ *	Average	Max.	Min.	Average	Max.	Min.
PLA		94	189	63	144	227	93
STD		106	295	56	188	638	89
UTI		93	210	40	157	219	106
Others		126	295	84	186	336	149
Clinics n ₂ *							
PLA		166	295	60	271.3	504	68
STD		234	295	102	383	510	301
UTI		80.5	112	70	241.3	389	101
Others		180	296	42	292	614	68

n₁*=50, n₂*=50

Others: dymenorrhoea, amenorrhoea, burning micturation, fever, loin pain, breast pain, and abortion.

5.6 Physician

5.6.1 Health Problem

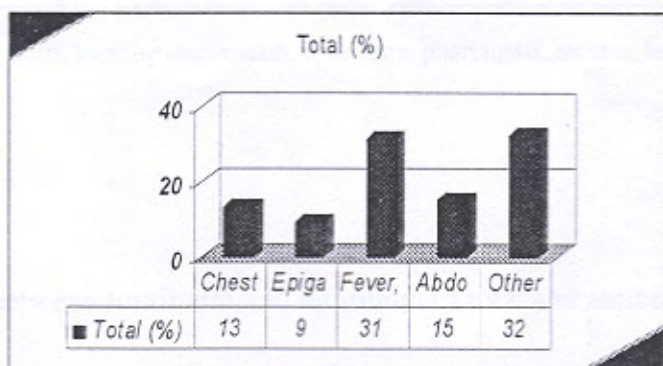
The result showed that maximum number of patients receives antibiotics from physician for fever and cough in both hospital and clinics.

Table VIII Health problem of patient receiving Antibiotics

Type of health problem	Hospital (%) n_1^*	Clinic (%) n_2^*	Total (%)
Chest pain	14	12	13
Epigastric pain	8	10	9
Fever, cough	38	24	31
Abdomen pain	12	12	15
Others*	28	36	32

$n_1^*=50$, $n_2^*=50$

*Others sinusitis, epididymorchitis, burning micturation, dysentery, pharyngitis, asthma, headache, vomiting, loose stool



5.6.2 Type of antibiotic used

The result showed that Physician prescribed the Amoxycillin for all the health problems in hospital while in clinic Ciprofloxacin was the predominating one.

Table IX Types of Antibiotics used by Physician

Health Problem	Antibiotics %										
	Cephalo	Amoxy	Cloxa	Ampi+ Cloxa	Cipro	Erythro	Doxy	Ofloxa	Norflox	Two Abs.	Others
Hospital n_1^*											
Chest pain	0	85.71	0	0	0	0	0	0	14.28	0	0
Fever, cough	0	58	5.26	0	31.57	0	5.26	0	0	0	0
Epigastric pain	0	75	0	0	0	0	25	0	0	0	0
Abdomen pain	0	50	0	0	16.66	0	0	0	16.66	0	16.66
Others	0	57.14	7.14	0	0	7.14	0	0	21.42	7.14	0
Clinics, n_2^*											
Chest pain	0	16.66	0	0	83.33	0	0	0	0	0	0
Fever, cough	16.66	33.33	0	0	16.66	25	0	0	0	0	8.33
Epigastric pain	0	0	0	0	80	0	20	0	0	0	0
Abdomen pain	0	0	0	0	100	0	0	0	0	0	0
Others	11.11	27.77	0	5.55	33.33	5.55	0	0	16.66	0	0

$n_1^*=50, n_2^*=50$

Others: sinusitis, epididymorchitis, burning micturation, dysentery, pharyngitis, asthma, headache, vomiting, loose stool

5.6.3 Cost

There was a difference between maximum and minimum of total and antibiotic cost both in hospital and clinic.

Table X Cost of treatment

Health Problem	Antibiotic cost (Rs.)			Total cost (Rs.)		
	Average	Max.	Min.	Average	Max.	Min.
Hospital n_1^*						
Chest pain	200	270	125	257	370	127
Epigastric pain	146.25	189	119	211	320	189
Fever, cough	155	300	98	206	305	300
Abdomen pain	112	189	75	170	279	189
Others	125.42	320	50	189	323	320
Clinic n_2^*						
Chest pain	109	154	78	181	223	154
Epigastric pain	75	161	63	217	481	161
fever, cough	140	189	52	231	418	189
Abdomen pain	153	192	64	221	287	192
Others	115	252	50	206	437	252

$n_1^*=50, n_2^*=50$

Others: sinusitis, epididymorchitis, burning micturation, dysentery, pharyngitis, asthma, headache, vomiting, loose stool

5.7 Surgeon

5.7.1 Health problem of patient receiving Antibiotics

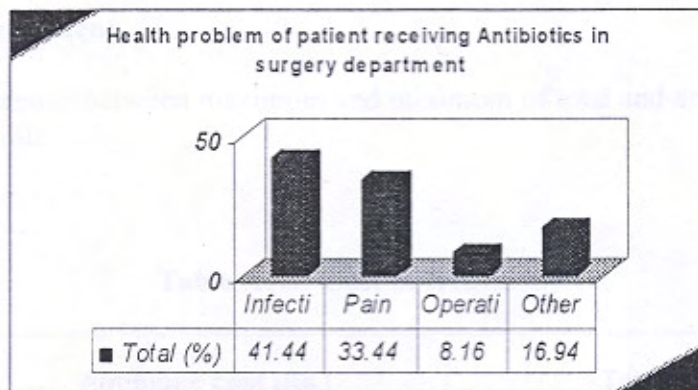
The result showed that the maximum number of patients received the antibiotic for infection and pain and inflammation in both hospital and clinic.

Table XI: Health problem of patient receiving Antibiotics

Type of health problem	Hospital (%) n_1^*	Clinic (%) n_2^*	Total (%)
Infection	44	38.88	41.44
Pain and inflammation	28	38.88	33.44
Operation	8	8.33	8.16
Others	20	13.33	16.94

$n_1^*=50, n_2^*=36$

Others: Gall stone, lymphoma, beast discharge, abscess etc.



5.7.2 Types of Antibiotics used

The result showed that Cloxacillin was mostly prescribed by surgeon in hospital for all the mentioned health problems and there was a variation in clinics.

Table XII: Types of Antibiotics used by Surgeon

Health Problem	Antibiotics %										
	Cephalo	Amoxy	Cloxa	Ampi+ Cloxa	Cipro	Erythro	Doxy	Ofloxa	Norflox	Two Abs.	Others
Hospital n₁*											
Infection	0	9.09	45.45	27.27	9.09	4.54	4.54	0	0	0	0
Pain and inflammation	0	7.14	42.85	21.42	21.42	0	7.14	0	0	0	0
Operation	0	0	50	50	0	0	0	0	0	0	0
Others	10	0	50	10	10	0	10	0	0	10	0
Clinics n₂*											
Infection	7.14	42.85	14.28	7.14	7.14	7.14	14.28	0	0	0	0
Pain and inflammation	7.14	7.14	21.42	0	28.57	0	14.28	7.14	14.28	0	0
Operation	0	0	0	33.33	66.66	0	0	0	0	0	0
Others	20	20	0	40	0	0	0	0	20	0	0

5.7.3 Cost of treatment

There was a difference between maximum and minimum of total and antibiotic cost both in hospital and clinic.

Table XIII: Cost of treatment

Health Problem	Antibiotic cost (Rs.)			Total cost (Rs.)		
	Average	Max.	Min.	Average	Max.	Min.
Hospital						
Infection	175	514	50	199	544	80
Pain and inflammation	133	210	56	168	259	56
Operation	143	168	122	158	184	131
Others	207.1	360	70	233	405	82
Clinic						
Infection	156	324	57	197	315	75
Pain and inflammation	146	266	65	269	342	74
Operation	144	168	122	180	211	139
Others	125	262	121	177	289	100

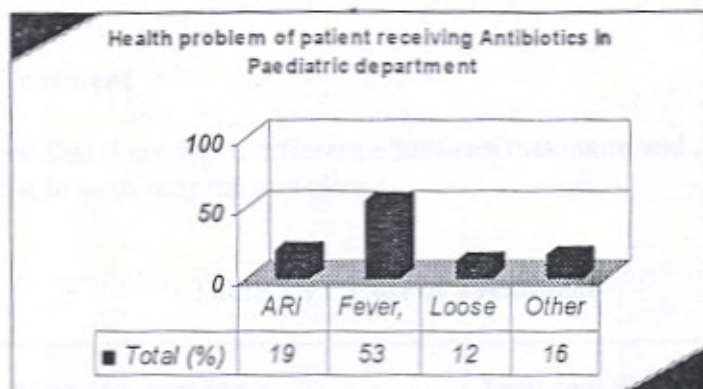
5.8 Paediatric

5.8.1 Health problem

The result showed that the patient with the problem of fever, cough and vomit received the maximum number of antibiotics in both hospital and clinics.

Table XIV Health problem of patient receiving Antibiotics

Type of health problem	Hospital (%)	Clinic (%)	Total (%)
ARI	28	10	19
Fever, cough, vomit	48	58	53
Loose stool	12	12	12
Other	12	20	16



5.8.2 Types of Antibiotics used

The result showed that the Amoxycillin was the mostly prescribed antibiotics by Paediatrician for all the mentioned health problems in both hospital and clinic.

Table XV: Types of Antibiotics used in Paediatric department

Health Problem	Antibiotics %											
	Hospital	Cephalo	Amoxy	Cloxa	Ampi+ Cloxa	Ciprø	Erythro	Doxy	Ofloxa	Norfloxx	Two Abs.	Others
ARI		14.28	57.14	0	7.14	14.14	7.14	0	0	0	0	0
Fever, cough, vomit		8	76	0	0	0	4	0	0	0	4	8
Loose stool		33.3	66.6	0	0	0	0	0	0	0	0	0
Others		14.28	28	0	0	0	42.8	0	0	0	0	14.28
Clinics												
ARI		-	100	0	0	0	0	0	0	0	0	0
Fever, cough, vomit		18.75	53.12	0	3.12	0	12.5	3.12	0	6.25	0	6.25
Loose stool		11.11	44.44	0	0	11.11	11.11	0	0	22.22	0	0
Others		20	30	10	10	0	0	0	0	30	0	0

5.8.3. Cost of Treatment

The result showed that there was a difference between maximum and minimum of total and antibiotic cost in both hospital and clinic.

Table XVI Cost of Treatment

Health Problem	Antibiotic cost (Rs.)			Total cost (Rs.)		
	Average	Max.	Min.	Average	Max.	Min.
Hospital						
ARI	85.14	292	36	102.78	292	43
Fever	63.63	195	40	100	229	63
Loose stool	43.5	65	32	89	111	64
Others	67.83	165	54	100	171	87
Clinic						
ARI	61.4	126	57	91.6	126	87
Fever	71.77	168	31.5	114	45	45
Loose stool	64.83	120	48	133.4	80	80
Others	116.54	504	21.8	142	24.8	24.8

5.9 Types of Antibiotics used

The result showed that the Amoxicillin was prescribed maximum by Physician of hospital and Ciprofloxacin by Physician of clinic. Ampicillin+ Cloxacillin and Cloxacillin were prescribed mostly by Surgeon of hospital. Mostly gynaecologist of hospital prescribed doxycycline and combination of two antibiotics. Whereas the Gynaecologist of clinic mostly prescribed Norfloxacin.

Table XVII : Types of Antibiotics in different speciality

Types %	Gynaecology		Physician		Paediatric		Surgery	
	Hospital	Clinic	Hospital	Clinic	Hospital	Clinic	Hospital	Clinic
Cephalosporin	0	11.11	0	5.55	17.46	12.46	2.5	8.57
Amoxicillin	6.95	15.71	65.17	15.56	56.95	56.89	4.05	17.4
Cloxacillin	0	2.5	2.48	0	0	2.5	47	8.9
Ampicillin+ Cloxacillin	5.59	13.7	0	1.11	1.78	3.28	27.17	20.1
Ciprofloxacin	12.67	8.5	9.64	62.66	3.53	2.7	10.12	25.5
Erythromycin	0	0	1.42	6.11	13.4	5.9	1.13	1.78
Doxycycline	26.84	7.38	6.05	4	0	0.78	5.42	7.14
Norfloxacin	0	32.32	10.47	3.33	0	14.61	0	8.57
Ofloxacin	0	2.44	0	0	0	0	0	1.78
Two Antibiotics	48	6.25	1.42	0	1	0	2.5	0
Others	0	0	3.33	1.66	5.56	1.56	0	0

5.10 Different groups of Antibiotics in use

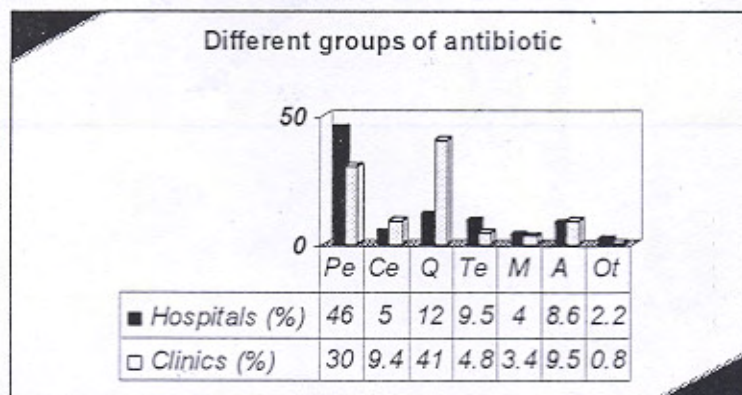
The result showed that the Penicillin group of antibiotics was mostly used in hospital. Quinolones and Fluroquinolones were prescribed in maximum amount in Clinics.

Table XVIII: Different group of Antibiotics use in Hospital and Clinic

Group of Antibiotic (%)	Hospital n_1^*	Clinic n_2^*
Penicillins	45.64	29.86
Cephalosporins	4.99	9.42
Quinolones and Fluroquinolones	11.58	40.60
Tetracyclines	9.47	4.82
Macrolides	3.98	3.44
Ampi+Cloxa	8.63	9.54
Others*	2.22	0.80

Others* : Cotrimoxazole, Chloramphenicol etc.

$n_1^*=200$, $n_2^*=200$

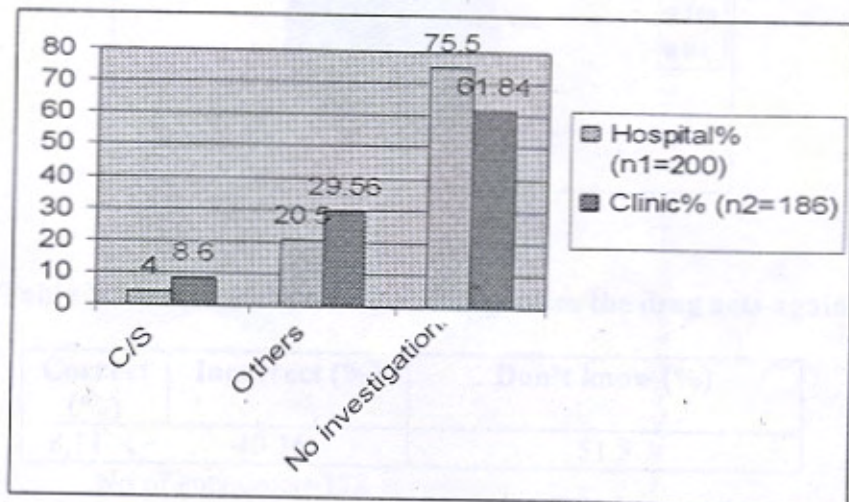


5.11 Investigations

The result showed that the practice of prescribing the antibiotics without investigation was more in both hospital and clinics. The difference in prescribing the antibiotic with C/S and others investigations in hospital and clinic was not significantly different at 1% level of significant.

Table XIX: Antibiotics prescribed with investigations

Investigations	Hospital% (n1=200)	Clinic% (n2=186)
C/S	4	8.6
Others	20.5	29.56
No investigations	75.5	61.84



5.12 Awareness of the encounters receiving Antibiotics

Table XX Aware on the word "Antibiotic"

Yes(%)	No(%)
46.08	53.9

total no of encounter= 386

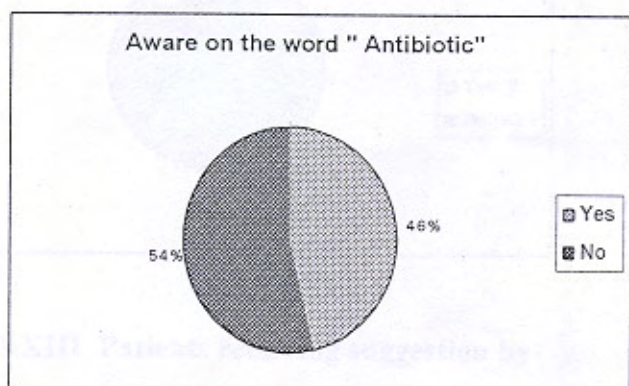


Table XXI Knowledge on which organism the drug acts against

Correct (%)	Incorrect (%)	Don't know (%)
8.11	40.36	51.5

No of encounter=178

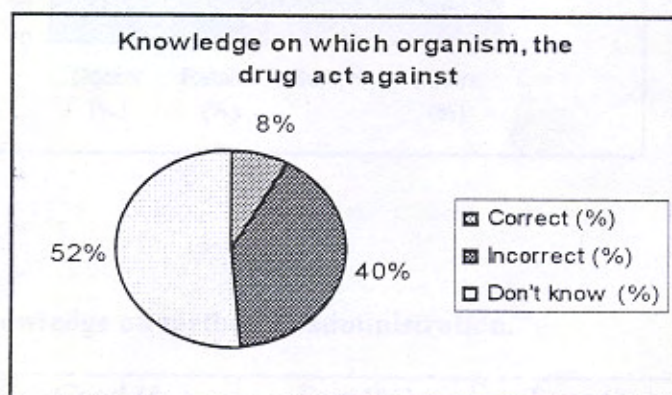


Table XXII Previous user

Yes (%)	No (%)
87.0	12.9

No of encounter=178

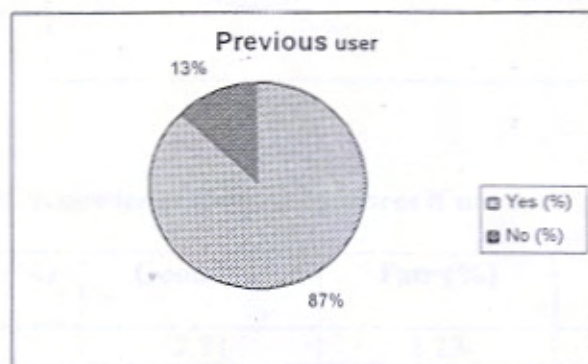


Table XXIII Patients receiving suggestion by

Doctor (%)	Retailer (%)	Self (%)	Others (%)
84.8	30.22	14.51	4.66

No of encounter=178

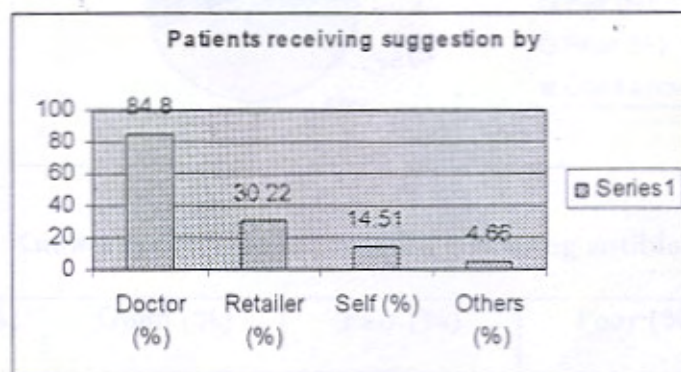


Table XXIV Knowledge on method of administration.

Excellent (%)	Good (%)	Fair (%)	Poor (%)	Don't know (%)
0	6.07	26.4	23.55	44

No of encounter=178

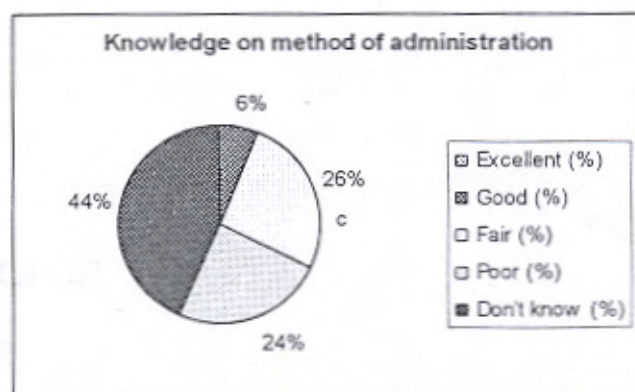


Table XXV Knowledge on consequences if not used properly.

Excellent (%)	Good (%)	Fair (%)	Poor (%)	Don't know (%)
0	2.21	8.23	58.56	30.96

No of encounter=178

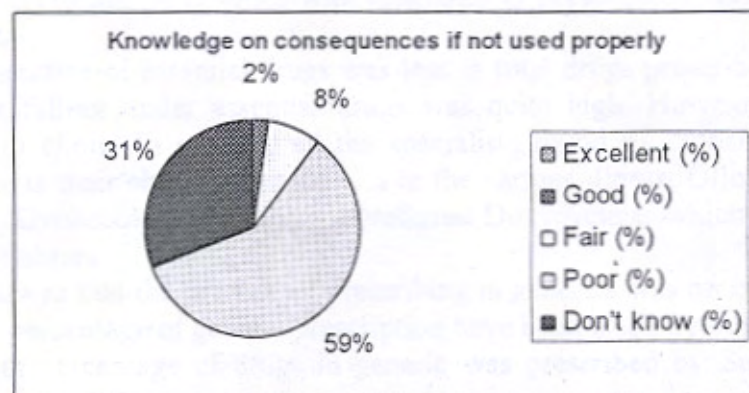
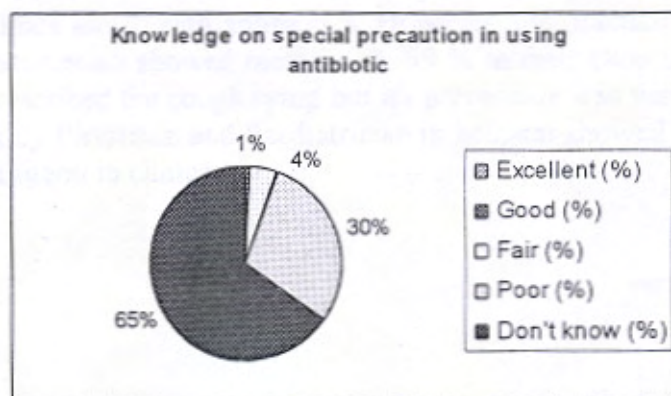


Table XXVI Knowledge on special precaution in using antibiotic.

Excellent (%)	Good (%)	Fair (%)	Poor (%)	Don't know (%)
0	0.78	4.4	29.5	65.28

No of encounter=178



CHAPTER 6

DISCUSSION

The study showed a slight more number of drugs recommended by gynecologist in clinic and least number of drugs were recommended by Paediatrician in hospital. The figure was quite high than that showed by other studies done in Nepal and in some other countries as well. The range of average number of drugs recommended lied between 2.18 to 3.2. However, the other studies was not concerned with the encounters that contained antibiotics only. The practice of prescribing essential drugs in clinics was observed to be less than that of hospital.

Paediatrician practiced the least percentage of essential drugs in clinic, in the other hand practice of prescribing antibiotics with diagnosis in prescription showed less in clinic than in hospital.

Though the practice of essential drugs was less in total drugs prescribed, the percentage of antibiotics falling under essential drugs was quite high. However, this was again slightly less in clinic. In general, all the specialists found to choose Amoxycillin and Ciprofloxacin as their choice of antibiotics in the various illness. Ofloxacin stood on the least priority. Gynaecologist in hospital preferred Doxycycline, which was unlikely with the other specialities.

The study showed that the practice of prescribing in generics was nil by the Paediatrician and very less percentage of generic prescription have been made by other speciality also. The maximum percentage of drugs in generic was prescribed by Surgeon in hospital, which was only 11.96%.

The prescription were also analyzed for unnecessary drugs, needlessly expensive drugs which showed maximum percentage of prescribed unnecessary drugs were made by Paediatrician in their clinics. Physician stood in the least in prescribing of unnecessary drugs. Encounters containing needlessly expensive drugs from surgeon at hospital and physician at clinic was nil but this was slightly more in the clinic of surgeon and paediatrician.

The study also covered separately the practice of prescribing the cough syrups, vitamins, enzymes by the clinician, which showed enzyme was prescribed maximum by Paediatrician of clinics along with antibiotics. However, the practice of prescribing the cough syrup by Paediatrician showed more i.e. 8.59% in their clinics. Gynaecologist in their clinics also prescribed the cough syrup but it's percentage was very less i.e. 0.63%. The use of vitamin by Physician and Paediatrician in hospital showed nil but it exceeded up to 3.57% by Surgeon in clinics.

Gynaecology

The study also analysed the health problems mentioned in the prescription. The patients visiting to gynaecologists at hospital had maximum complain of STD i.e. 70%, while it was only 10% in clinics. Similarly the complain of PLA was less in hospital and more in clinics i.e. 8% and 40% respectively.

In the use of different types of antibiotics Amoxycillin, Ciprofloxacin, Doxycycline and combination of other two antibiotics stood same in the patients with the complain of PLA in hospital whereas Doxycycline stood as a first of a priority in the case of STD in the clinic. But this varied in case of STD wherein combination of two groups of antibiotics and Doxycycline appeared as mostly used antibiotic. Similarly Ampicillin + Cloxacillin and Cephalosporins was found to be prescribed in almost equal percentage in clinics. While prescription for Cephalosporins in hospital was nil.

In the analysis of cost of treatment, the cost of treatment varied significantly in hospital and clinic except in the treatment of complaint for PLA. The average cost of treatment in STD was Rs. 383 in clinic where as it was Rs.188 in hospital. The maximum cost of treatment found for STD in both hospital and clinic appeared to be almost same.

Physician

38% of the patients visiting to hospital who received antibiotics have complained a fever and cough. The similar trend was found in patient visiting to clinics.

Amoxycillin stood as a first priority to be prescribed for all types of complains in hospital. But the practice of prescribing Ciprofloxacin showed higher in clinics. With regard to the cost of treatment, less variation was observed in the average cost of treatment in compared to the Gynaecologists. The average cost of treatment with the antibiotics for chest pain varied in both clinic and hospital showing lowest in the case of clinic.

Surgeon

The leading cause for the person visiting to Surgeon at hospital was infection and received antibiotics i.e. 44% but this was slightly low in case of clinic with the addition of complain of pain and inflammation ranging from 28- 38%.

Ciprofloxacin, Ampicillin+Cloxacillin and Cloxacillin stood as a most practiced antibiotic in both hospital and clinic. The practice of using two antibiotics was less in surgical patients. The cost of treatment in both hospital and clinic was not much different. The minimum and maximum cost of treatment with the antibiotics to the patients having infection both in hospital and clinic showed the significant difference.

Paediatrics

The highest number of Paediatric patients visiting in both hospital and clinic receiving antibiotics complained with the problem of fever, cough, and vomit.

The practice of prescribing Amoxycillin was maximum for cough, fever and vomit in hospital i.e. 76% but this figure was different for the case of ARI in clinic i.e. 100%.

33.3% of patients with the complain of loose stool received Cephalosporins in hospital while it is only up to 11.1% in clinics.

The cost of treatment showed little higher in clinics than hospital. The maximum and minimum cost of treatment in the case of ARI in hospital is very high. However, the

difference in the average cost of treatment with the antibiotics and average cost of treatment with the total drugs in the case of ARI have not much been fluctuated in the case of clinics.

Awareness

The patients and the guardian (in case of Pediatrics) were interviewed.

About 54% of responded were unaware of antibiotics. Those having heard about antibiotics were asked for the knowledge on which the antibiotic acts against; only 8.11% of patient had correct knowledge. In response to the past history for the use of antibiotics, 87% of responded gave their positive response, but 49% of patient received antibiotics without prescription from a doctor. In response to the question about the method of administration in the use of antibiotics, 43.14% could not responded and only 6% had good responses and none of them had adequate knowledge.

Similarly for the question of consequences for the wrong use of antibiotics, 31% were unaware and 58% had little knowledge but none of them had adequate knowledge. The majority of patients were unaware on the contraindication of antibiotics i.e. (65%) and none had an adequate knowledge.

CHAPTER 7

RECOMMENDATION

- Effective information dissemination strategies for the public should be implemented to ensure access to appropriate information on antibiotics at all levels.
- Availability of locally appropriate information including on antibiotic resistance should be a priority.
- Generic prescribing and practice of essential drug should be encouraged.
- Prescription of vitamins and tonics should be discouraged
- A lack of standard treatment protocol is felt. Therefore a protocol should be developed by hospitals or concerned authorities to ease the prescribers for uniform prescription.
- Prescription for the needlessly expensive drugs should be discouraged at all possible levels
- Unethical promotion of the antibiotics by the pharmaceutical companies should be prohibited
- Surveillance on the patterns of drug resistance should be conducted
- Effective antibiotic policy should be enacted as soon as possible
- A massive consumer awareness programme should be conducted to aware the common people on the use of antibiotics.

CHAPTER 8

Conclusion

The proper and correct use of antibiotics is an utmost necessity of current situation in today's world. The emerging antibiotic resistance is a global problem directly related to inappropriate use. Education of the patient and the prescriber is a prerequisite for any policy to promote rational antibiotic use.

There are differences in prescribing practices of antibiotics in hospital and clinic. The difference in prescribing antibiotics by diagnosis is significantly different in hospital and clinic at 1 % level of significance. Only minimum people are aware on the proper use of antibiotics.

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ANNEXE 1

Essential drugs:

Drugs included in Essential drug List (EDL) are as follows under National Drug Formulary.

Needlessly expensive:

Expensive Antihistamines: Cetirizine, Dexchlorpheniramine, Astemizole, Terfenadine

Expensive NSAID: Flurbiprofen, Naproxen, Piroxicam

Expensive Antibiotics: Amikacin, Nalidixic Acid, Cefotaxime, Ceftriaxone, Ceftrizoxim, Ceftazidime, Cefuroxime, Cefadroxil, Cefoperazone, Minocycline, Cefaclor etc

Unnecessary drugs: Appetite Stimulant (e.g cyproheptadine), Systemic Nasal Decongestants, Loperamide, Diphenoxylate+ Atropine, Multi- ingredient Vitamins/ Tonic, Disodium Hydrogen Citrate and B- complex, Enzymes.

Alternative Medicine: Herbal medicine

ANNEX 2

Glossary

Alt	Alternative drug
Amoxy	Amoxicillin
Ampi+Cloxa	Ampicillin +Cloxacillin
APUA	Alliance of Prudent Use of Antibiotic
ARI	Acute respiratory infection
C	Clinic
C/S	Culture sensitivity
Ce	Cephalosporins
Cephalo	Cephalosporins
Cipro	Ciprofloxacin
Cloxa	Cloxacillin
Co	Cough Syrup
Doxy	Doxycycline
En	Enzyme
Erythro	Erythromycin
Es	Essential drug
G	Generic
Gynae	Gynaecology
H	Hospital
Inj	Injection
INRUD	International Network for Rational Use of Drugs
M	Macrolide
Max	Maximum
Min	Minimum
N	No
Ne	Needlessly Expensive drug
Norflo	Norfloxacin
NS	Non-specific.
Ofloxa	Ofloxacin
OPD	Out patient department
Ot	Others
PA	Pain in abdomen
Paed	Pediatrics
Pe	Penicillin
PHON	Pharmaceutical Horizon of Nepal
PLA	Pain in lower abdomen
Q	Quinolone
STD	Sexually Transmitted Disease
Te	Tetracycline
Un	Unnecessary drug
UTI	Urinary tract Infection
Vit	Vitamin
WHO	World Health Organization

ANNEX 3

1. Have you heard about antibiotics?

- Yes No

2. What concept do you have for the use of antibiotic?
(What does antibiotic work against?)

- It is used against Virus It is used against Bacteria
 It is used against Amoeba It is used against Giardia
 Do not know If any other (specify)

3. Have you ever used antibiotic before?

- Yes No

4. If Yes who did suggest you to take?

- Doctor Drug retailer Self Others (Specify)

5. What methods of administration need to be considered in using antibiotic?
(Ask "anything else" three times after each response).

- Dose/Duration Time of administration
 Severity of disease Infection site
 Do not know

6. What might happen if methods of administration of antibiotics are not followed correctly? (Ask "anything else" three times after each response).

- Ineffectiveness of the same drug for future use
 Need to use other expensive antibiotic.
 Need a high dose of the same antibiotic.
 Relapse
 Do not know

7. Which conditions need to take special precaution in using antibiotic?
(Ask "anything else" three times after each response).

- Pregnancy Lactating mother Kidney disease
 Liver disease Do not know

Encounter Form

ANNEX 4

Excellent	Good	Fair	Poor	Do not know
4	3	2	1	0

Correct	Incorrect	Do not know
Used against bacteria	Other than correct	

1	1	1	1	0
Dose/Duration	Time of administration	Infection site	Severity of disease	Do not know

1	1	1	1	0
Ineffectiveness of the same drug for future use	Need to use other expensive antibiotic	Need a high dose of the same antibiotic	Relapse	Do not know

1	1	1	1	0
Pregnancy	Lactating mother	Liver disease	Kidney disease	Do not know

Encounter Form

	Patient Identifier (Name)	Age	Sex	Specialist	Date
	Health Problem Description/Diagnosis		Investigation/ Laboratory test		
Health Problems					
	Prescription Character				
	Drugs name, strength and dose				
	1.				
	2.				
	3.				
Drugs	4.				
	5.				
	6.				
	7.				

Hospital/Clinic.....

District:

Date.....

Enumerator.....

