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Research Article

## A SURVEY ON PRESCRIPTION PATTERN OF ANTIBIOTIC UTILIZATION IN BATHINDA DISTRICT

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**Abstract:**

*The purpose of this study is to see inappropriate polypharmacy which is related to negative health outcomes. For this project we designed a questionnaire and that we collect information by taking 100 cases from various departments like gynae, surgery, medicine, paediatrics and ENT of Bathinda district. Then we evaluate polypharmacy in keeping with the age bracket and gender. In some cases drug are prescribed in step with rational use of medication where as in some case drugs are given quite optimum because of some circumstances. From this study we conclude that to supply rational prescribers instead of confused practitioners in therapeutic level to beat inappropriate polypharmacy and to boost use of medicines in proper manner. In India it's important to watch the prescription pattern to market rational use of medicine.*

*Keywords : inappropriate , polypharmacy , optimum , rational, prescription.*

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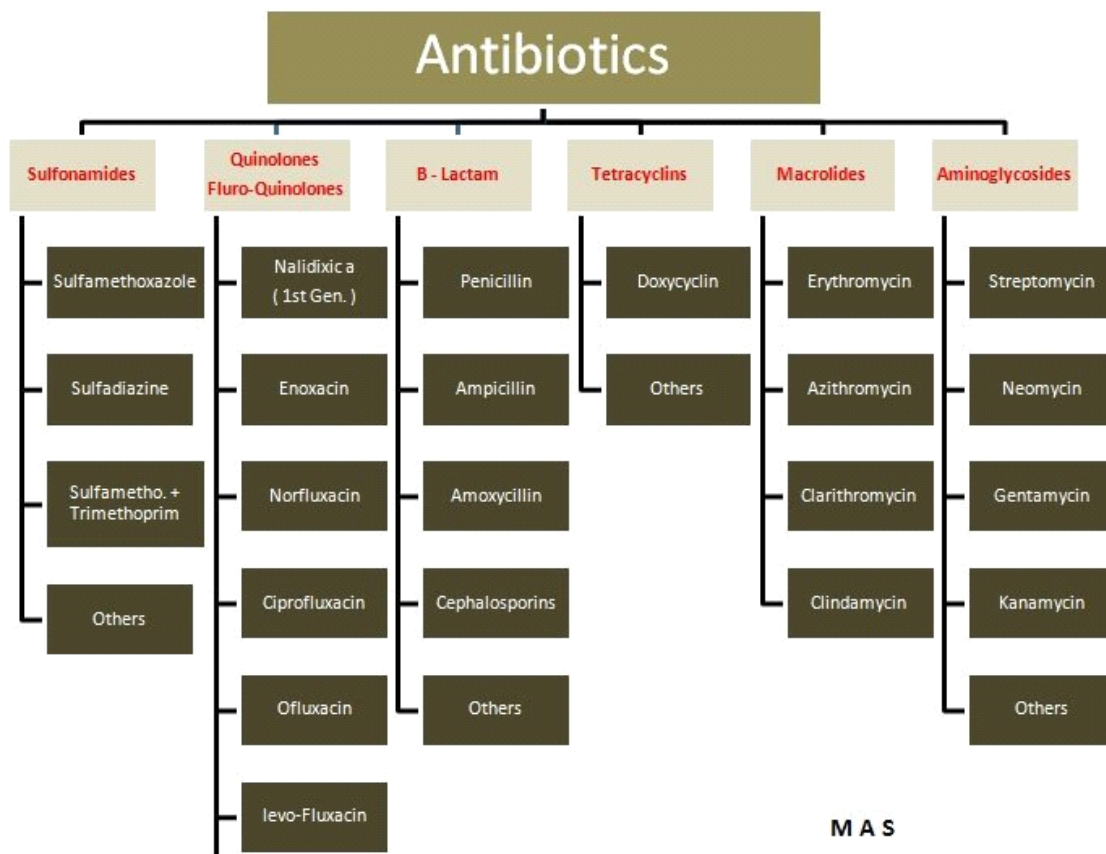


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**INTRODUCTION:****Antibiotics**

Antibiotics are form of antimicrobial drugs active against bacteria and is that the most significant sort of antibacterial agents for fighting bacterial infections. Antibiotics medications are extensively utilized in treatment and prevention of various bacterial infections like ear and sinus infections,

dental infections, respiratory disorder, bladder and kidney infections, skin infections and even cancer etc.[1] Antibiotics cannot cure viral infections like cold, flu and most coughs. they will either kill or inhibit the expansion of bacteria called bacteriacidal or bacteriostatic respectively. the primary natural antibiotic, Pencillin was discovered by Sir Alexander Fleming in 1928.[2]

**CLASSIFICATION OF ANTIBIOTICS****MECHANISM OF ACTION**

Generally antibiotics works by five sorts of mechanism of actions that are:-

1. Inhibition of plasma membrane synthesis
2. Inhibition of protein synthesis
3. Inhibition of nucleic acid synthesis
4. Inhibition of metabolic pathways
5. Interference with cell wall integrity

**PENICILLINS**

Structurally, penicillins are B-lactam antibiotics. Bacterial cell walls are consisting of a protective peptidoglycan layer, which is continuous undergoing remodelling. In order to create cytomembrane, one peptidoglycon chain (NAM) is cross linked to other peptidoglycon chain (NAG) through the action of enzyme transpeptidase. This cross linking peptide chains provides rigidity ,to the otherwise fluid cell membrane. The pencillins work by inhibiting enzyme transpeptidase results in inhibition plasma membrane synthesis.[3]

**SULFONAMIDES**

Sulphonamides are the structural analogues of PABA Para aminobenzoic acid. sulphonamides are bacteriostatic in nature. sulphonamides competitively inhibit dihydropteroate synthetase, which is an enzyme that catalyses the synthesis of dihydrofolic acid (folic acid) [4].

**TETRACYCLINES**

Tetracyclines are broad spectrum antibiotics, having a teracene ring structure.Tetracyclines are bacteriocidal in natue. Tetracyclines block bacterial

plasma membrane growth by inhibiting protein synthesis. Tetracycline act by binding the 30S subunit of the ribosome at A site. During protein biosynthesis the new tRNA with amino acid attempts to bind to A site of ribosome. However A site is blocked by tetracycline, aminoacyl-tRNA cannot bind to it[5]. Thus without sequential attachment of the tRNA at the A site, protein biosynthesis can't occur which results in the death of the bacterial cell.

#### CEPHALOSPORINS

Cephalosporins are bactericidal and have the identical mode of action as other  $\beta$  lactam antibiotics, but are less susceptible to  $\beta$  lactamases. Cephalosporins disrupt the synthesis of peptidoglycan layer forming the bacterial plasma membrane which causes death of the cell.

#### AMINOGLYCOSIDES

Aminoglycosides bind to the bacterial 30S ribosomal sub unit and inhibit the translocation of tRNA during translocation and leaving the bacterium unable to synthesize proteins necessary for the expansion of the cell [6].

#### ADVANTAGES OF ANTIBIOTICS

The antibiotics are effective against the infections caused by the microorganisms, a number of antibiotics are effective against many types of diseases, they will save the life, they'll kill the bacteria within the body, they're used as drugs to combat various diseases which are caused by the harmful microorganisms.

The antibiotics don't harm other normal body cells, it's possible to treat the diseases by the antibiotics which were fatal before the event of antibiotics, the prescribed antibiotics can harm the disease causing the microorganisms but the antibiotics are developed to attack the human cells for the treatment of cancer.

Macrolide antibiotics are strongly germ-killing medicines, they need been regarded among the best-tolerated antibiotics for nearly 50 years, they need broad antibacterial spectrum, they're simple to use which have convenient dosing regimens and that they are used daily or twice dosing regimen [7].

The antibiotics have low incidence of gastrointestinal side effects, they'll be used broadly by all age groups, they're safe within the pregnancy period too, they need enhanced acid stabilities, they are doing not create problems within the tissue and therefore the intracellular penetration and tiny quantities of antibiotics are used as the food preservatives.

The antibiotics are one class of antimicrobials, a bigger group which incorporates the anti-viral, the anti-fungal, and also the anti-parasitic drugs, they're reasonably harmless to the humans, they will be accustomed cure the infections caused by bacteria and that they are accustomed treat the infectious diseases within the animals.

#### DISADVANTAGES OF ANTIBIOTICS

Antibiotics having plenty of adverse effects just like the diarrhoea, the irrational use of the antibiotics is that the main problem worldwide, the overuse of the antibiotics is that the main cause for increasing within the bacterial infections. So, that bacteria are become immune to the antibacterial medications.

Excessive Antibiotics may diminish the healthy bacteria within the body, Somewhere the antibiotics may result in the more complications like yeast infections, some antibiotics could also be allergic like sulfa that's mostly present in antibiotics.

Most of the antibiotics have the side effects just like the digestion issues, nausea, discomfort and also the sensitivity to the sunshine, Antibiotics can cause the allergic response, Their long-term health hazards aren't known. The side effects are varied and range varies from fever and nausea to major sensitivity, The common side effect is that the diarrhoea because the antibiotic disrupt the conventional balance of the microorganism and therefore the microfauna.

New strains produced by the mutations are proof against the antibiotics, the new mutants having more adaptable properties so they replace the non-mutated ones and that they sustain the antibiotics attack.

The irrational use of the antibiotics within the poultry (the meat, the dairy products) production can transfer the residual antibiotics to the human food because the result bacteria present in organic structure get resistant.

#### ANTIBIOTIC RESISTANCE

World Health Organization (WHO) classified antimicrobial resistance as a significant threat and now not a prediction for the long run. Antibiotic resistance is now spreading all parts of the globe and it affects everyone irrespective to the age & sex. When bacteria become immune to class one drugs, then dearer therapies must be used. a extended duration of illness and treatment, often in hospitals, increases health care costs additionally because the economic burden on families and societies. to assist prevent the event of current and future bacterial resistance, it's important to

prescribe antibiotics in keeping with the guidelines of antimicrobial stewardship, like prescribing antibiotics only they're needed[8]. The US Centers for Disease Control and Prevention (CDC) said today that antibiotic-resistant pathogens sicken 2 million Americans a year and listed the three most urgent threats as *Clostridium difficile*, carbapenem-resistant *Enterobacteriaceae* (CRE), and gonococcus. Antibiotic-resistant microorganisms play a job in 23,000 deaths annually, the CDC said.

#### POLYPHARMACY

The term polypharmacy refers to the group of medicines one person could also be taking. It comes from two Greek root words: poly, meaning many, and pharmakeia meaning medicines or drugs [9]. it's generally used when that one person is taking too many medications, or when the drugs are prescribed by many doctors, and should not be coordinated well. The definition of polypharmacy continues to be controversial. One simple definition is predicated on the full number of various medications a patient takes concurrently. There are several reasons for polypharmacy:

1. because the population ages, polypharmacy increases. The elderly often required multiple medications to treat multiple health-related conditions.
2. Patient with multiple comorbid medical conditions also required numerous medications to treat each condition. it's not unreasonable for patient with multiple comorbid medical conditions to get on 6-9 medications to cut back his or her long-term risk for those conditions, i.e, diabetes conditions and coronary events.
3. A recent hospitalization also puts patients in danger of polypharmacy. Medicines are started and stopped quite frequently during patient hospital stay.
4. Multiple doctors are prescribing medications for the identical patient. Once a patient starts a medicine, it's never discontinued.

#### RESULT AND DISCUSSION:

We take 100 prescriptions from various departments of bathinda district hospitals, these are divided in to following departments as follows:

DEPARTMENT	TOTAL PRESCRIPTIONS
PEDIATRICS	2
SURGERY	6
MEDICINE	61
GYNAE	8
ENT	23

5. Lack of patient education is that the commonest reason. Doctors don't inform patients or patients don't ask questions. Polypharmacy may occur when additional drugs are prescribed to treat the adverse effects of other drugs. this can be referred to as the 'prescribing cascade'. Other suboptimal prescribing related to polypharmacy includes prescription of quite one drug within the same class or prescription of a drug that interacts with or is contraindicated together with another of the patient's medicines [10].

#### MATERIAL AND METHODS:

##### INCLUSION AND EXCLUSION CRITERIA

##### INCLUSION CRITERIA

- ☺ Patients of all age group and sex.
- ☺ Patients visiting out patient department suffering with different types of diseases.

##### EXCLUSION CRITERIA

- ☺ Pregnant and lactating women's
- ☺ patients chronically ill.

A retrospective study was carried out in Bathinda district by collecting prescriptions of consultants at various levels of health care. Patients attending the clinics of consultants by taking their oral consent.

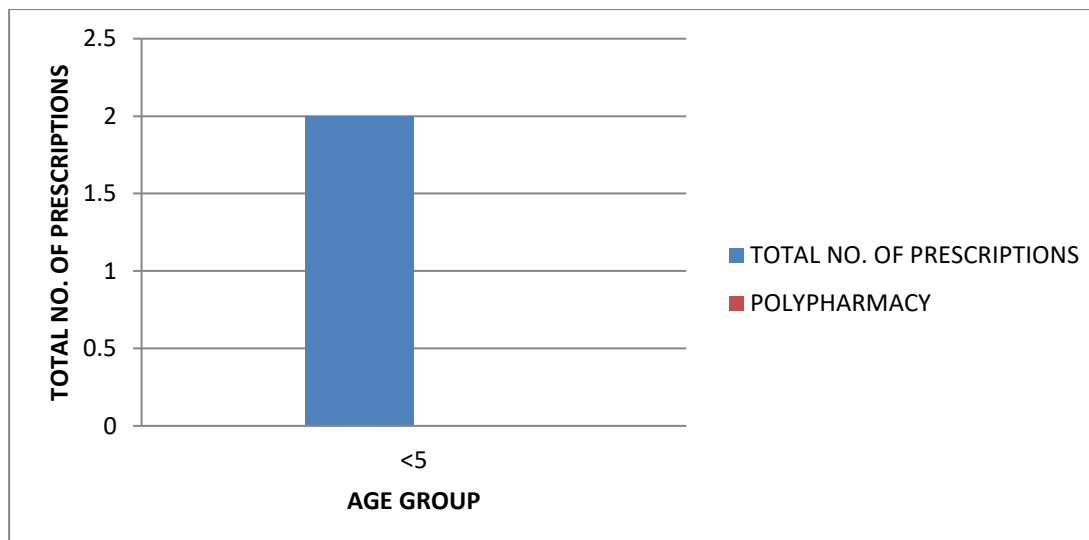
##### PLAN OF WORK

Study will be observational and questionnaire based on investigation for polypharmacy. Prescriptions are collected by simple random sampling technique. Information collected by the questionnaire included the following:

- Patient's demography information
- Patient's age, sex
- Date of prescription
- Current medical conditions
- Medical history of patient
- Signs and symptoms
- Current prescription medications (drug, dose, frequency, indication)
- Current drug products or nutritional supplements
- Dosage regimen

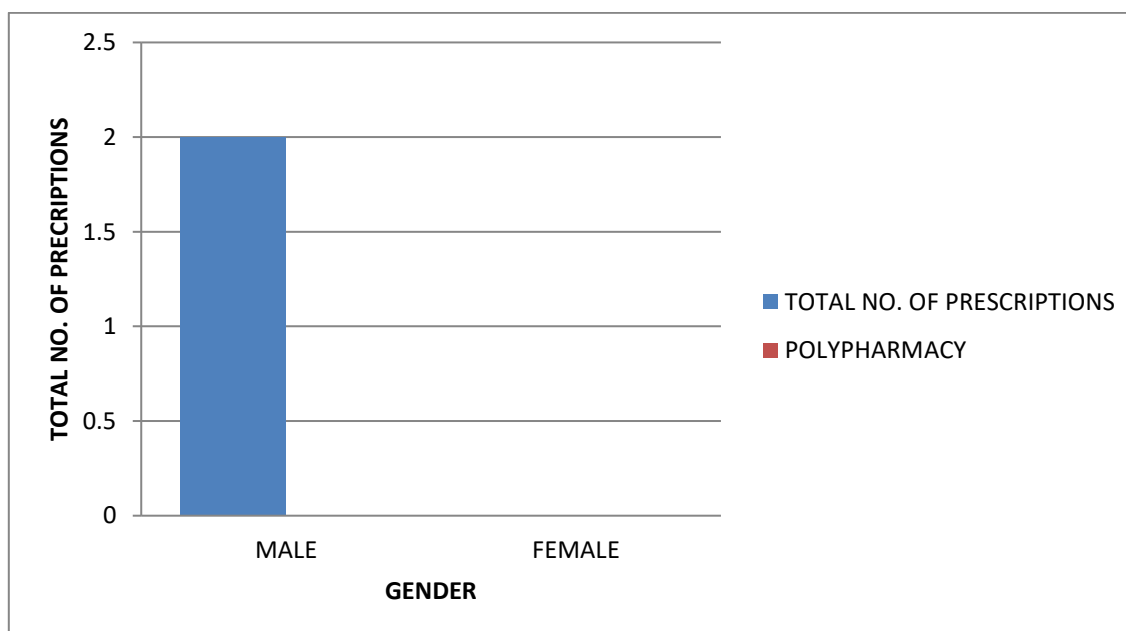
**PEDIARTICS:** Out of total prescriptions, 2 prescriptions are of pediatrics department. According to age group (less than five years old) , all the medicaments are prescribed in the rational manner.

AGE GROUP	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
<5	2	-



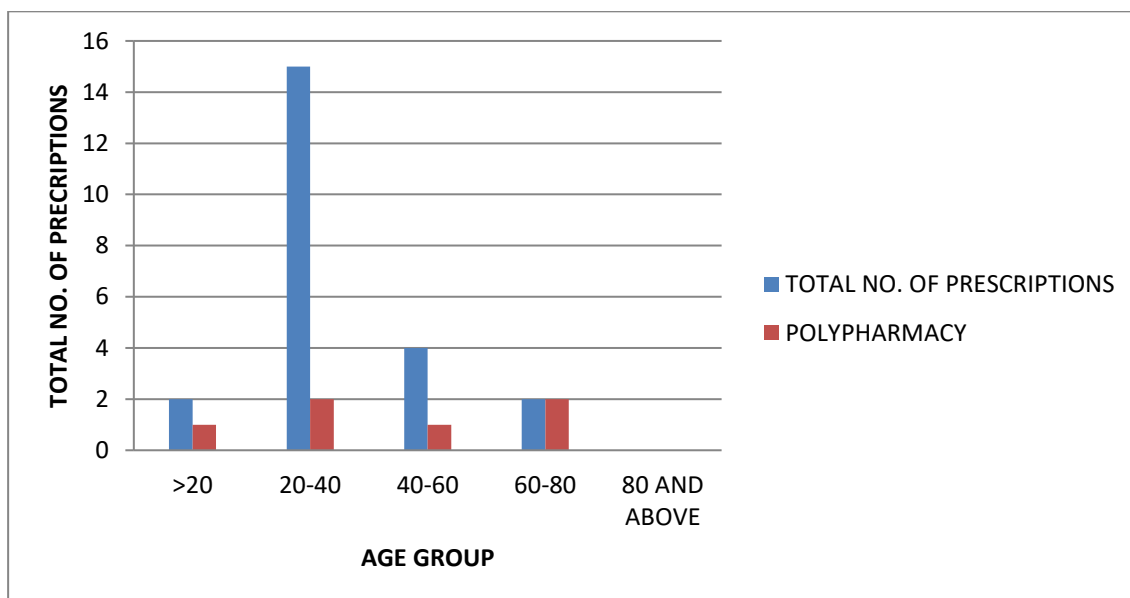
According to the gender, in case of males all the medicaments are prescribed in the rational manner.

GENDER	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
MALE	2	-
FEMALE	0	-



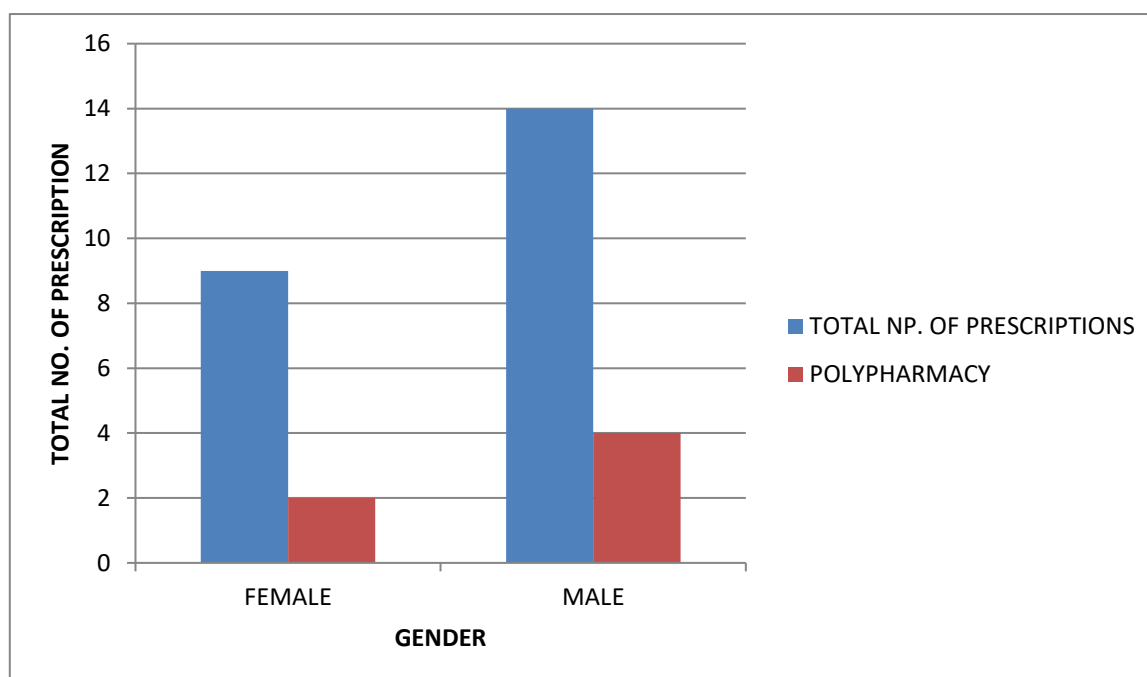
**ENT:** Total prescriptions from ENT department are 23, according to both gender & age group. More than rational manner drugs are prescribed by the physician due to patient's health condition. In age group involving age from 0-20, 20 – 40, 40-60 & 60-80, 6 prescriptions are having more drugs then required due to some circumstances but these does not show any irrational use or side effects.

AGE GROUP	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
>20	2	1
20-40	15	2
40-60	4	1
60-80	2	2
80 AND ABOVE	0	0



According to the gender, in case of both males (4 out of 14) and females (2 out of 9) medicaments are given more than optimum due to circumstances & some health reasons but this does not show any side effect.

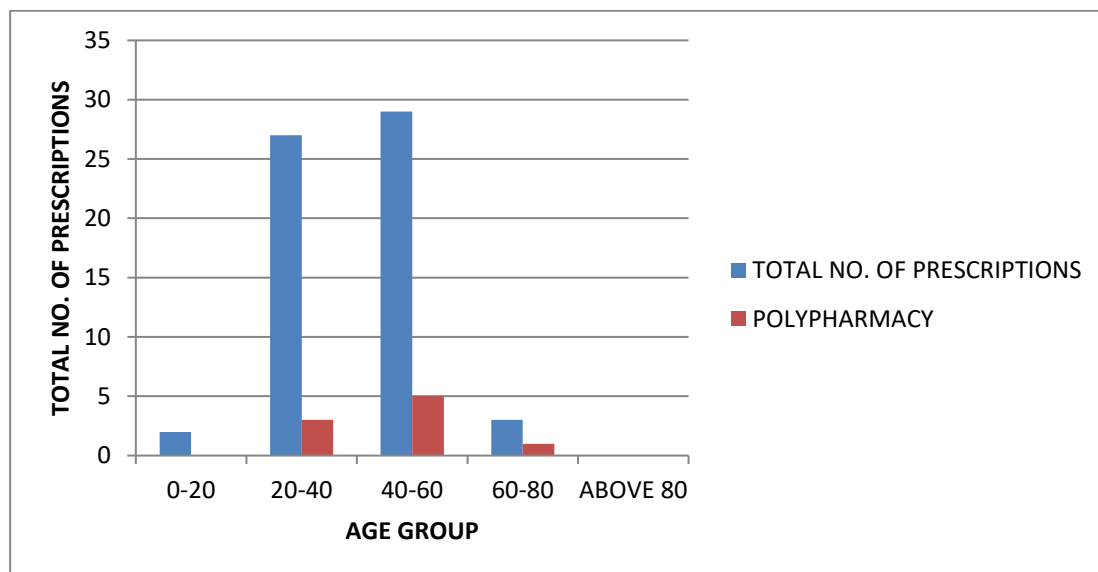
GENDER	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
FEMALE	9	2
MALE	14	4



**GENERAL MEDICINE:** In department of medicine there are total prescriptions are 61, involving both the gender & age group (age group 0 – 80).

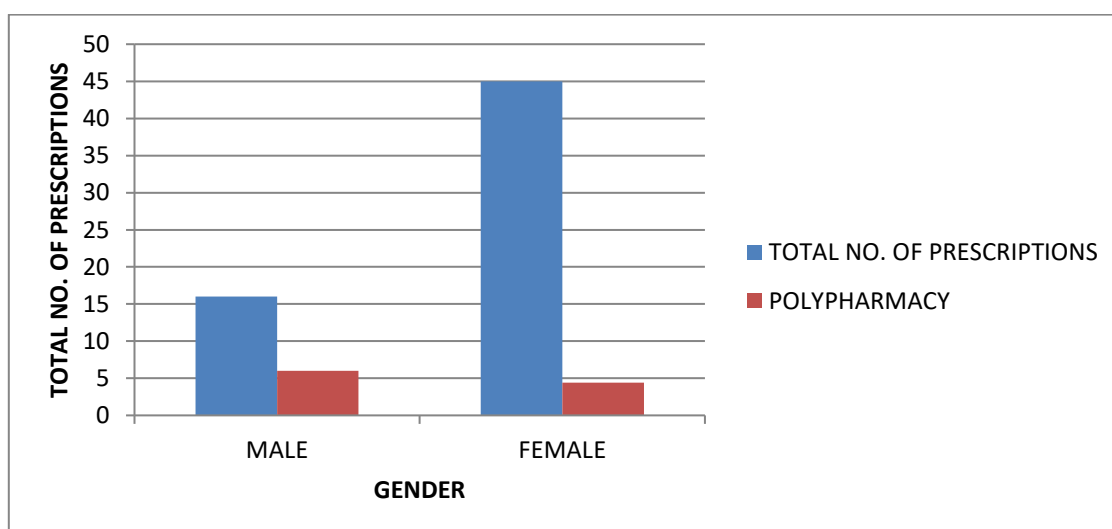
In patients of age group 20-40, 40-60, 60-80 medicaments are given more than optimum due to circumstances & same health reasons but this does not show any side effect.

AGE GROUP	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
0-20	2	0
20-40	27	3
40-60	29	5
60-80	3	1
ABOVE 80	0	0



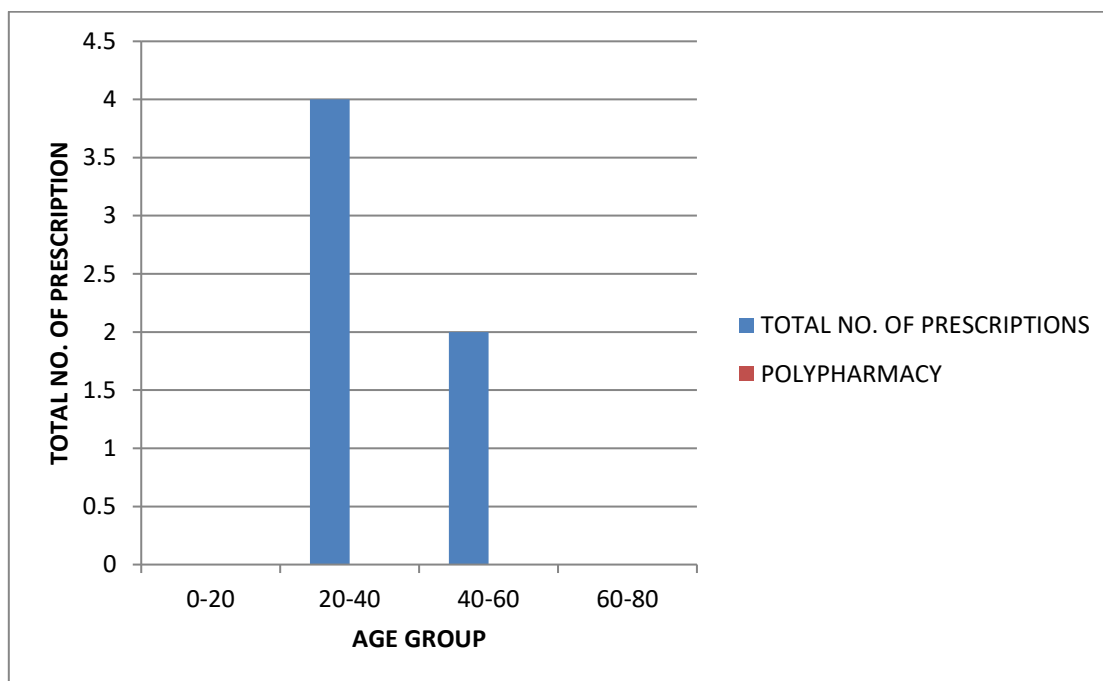
According to the gender, in case of both males (6 out of 16) and females (3 out of 45) medicaments are given more than optimum due to circumstances & some health reasons but this does not show any side effect.

GENDER	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
MALE	16	6
FEMALE	45	3



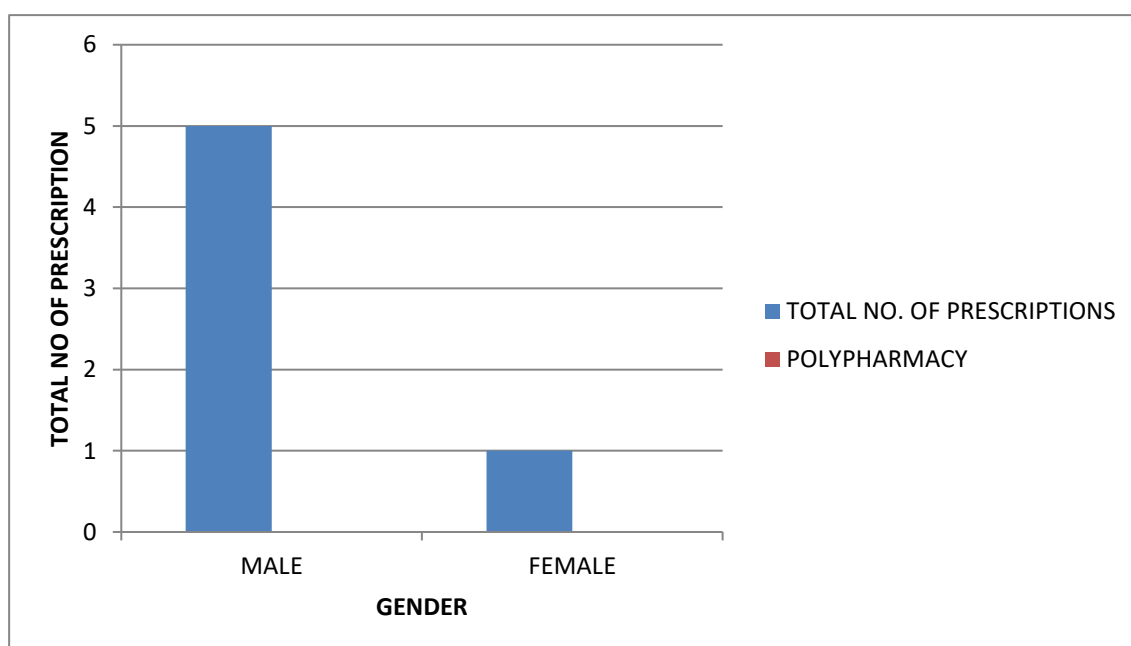
**SURGERY:** Total prescriptions of surgery department, out of total prescriptions are 6. In surgery prescriptions according to age group all the medicaments are given in proper way (rational use) .

AGE GROUP	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
0-20	0	-
20-40	4	-
40-60	2	-
60-80	0	-



According to the gender, in case of both males and females all the medicaments are prescribed in the rational manner.

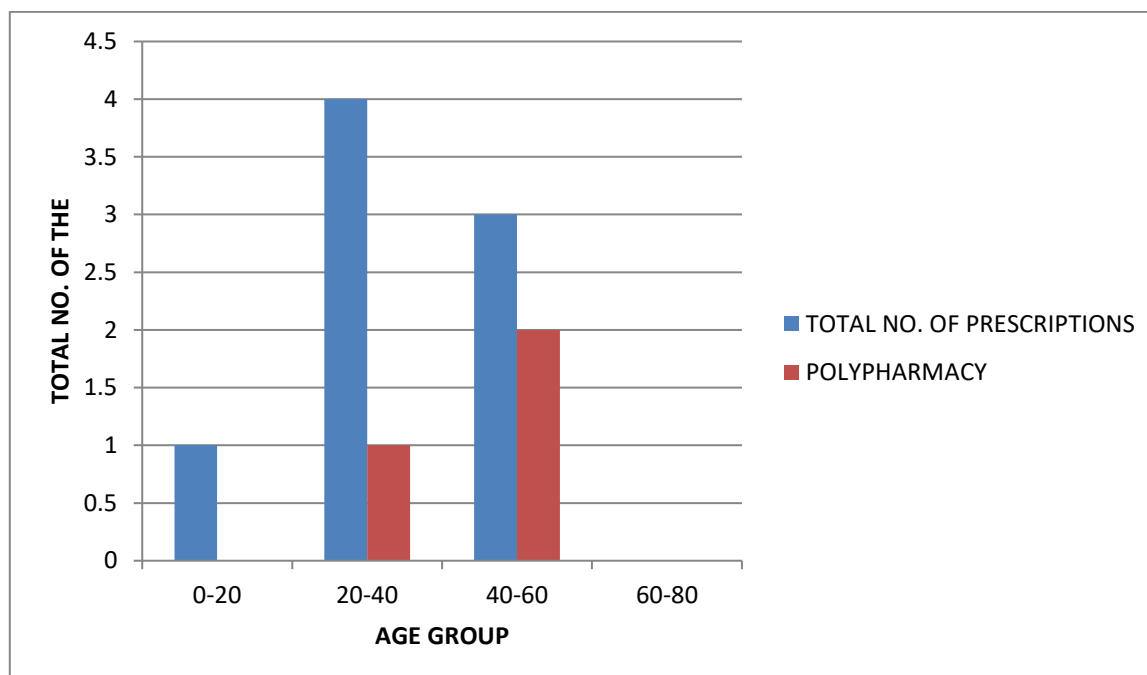
GENDER	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
MALE	5	0
FEMALE	1	0





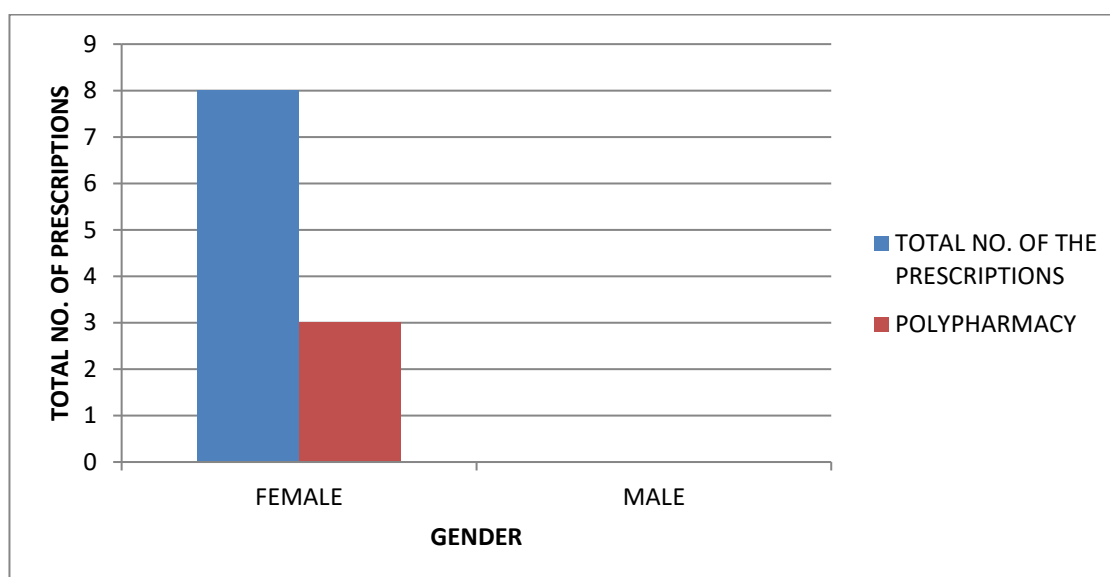
**GYNAECOLOGY:** In this department total 8 prescriptions are taken according to both age group & gender. In patients of age group 20-40, 40-60, medicaments are given more than optimum due to circumstances & some health reasons but this does not show any side effect.

AGE GROUP	TOTAL NO. OF THE PRESCRIPTIONS	POLYPHARMACY
0-20	1	0
20-40	4	1
40-60	3	2
60-80	0	0



According to the gender, in case of females (3 out of 8) medicaments are given more than optimum due to circumstances & same health reasons but this does not show any side effect.

GENDER	TOTAL NO. OF PRESCRIPTIONS	POLYPHARMACY
FEMALE	8	3
MALE	0	0



**CONCLUSION:**

The evaluation of prescription pattern study concludes that to supply rational prescribers instead of confused practitioners in therapeutic level. In INDIA, there is that the must monitor the prescription pattern to market the rational use of drug.

**ACKNOWLEDGEMENT**

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**CONFLICT OF INTEREST**

The author declared no conflict of interest.

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