

Original Research Article

## Drug Utilization Study in Bingham University Teaching Hospital

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Accepted 5th June, 2015.

**Background:** The World Health Organization (WHO) has defined drug utilization research as the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences. **Aim:** The present study evaluates the utilization pattern of therapeutic agents in this health care delivery system. **Methods:** Four hundred and seventeen medical records were assessed; age, sex, clinical conditions, drug prescribed and duration of therapy were used to gather primary data. **Results:** Analysis showed that 77.7% of the patients were females while 22.3% were males and most of them (44.1%) were within the age groups of 20-29yrs. The most clinical diagnosis was gynecological disease (58.1%). There are 2127 drugs in 417 prescriptions, month of March had the highest prescriptions, other drugs (58.0%) were the most commonly prescribed drugs for other systems and they also had the highest prescribing prevalence with majority of these drugs being antianaemic (15.2%). 56.7% of the drugs were prescribed in generic names and 45.8% were orally administered. **Conclusion:** The present study will serve as a basis for the planning program of education and information for health care practitioners.

**Keywords:** Drug utilization, Patients, Clinical diagnosis, Prescription, Prescribing prevalence.

### INTRODUCTION

Drug utilization pattern identifies the problems that arise from the drug usage in health care delivery system and highlights the current approaches to the rational use of drugs (Adiga *et al*, 2009). Prescription of drugs is an important skill, which needs to be continuously assessed and refined accordingly. It not only reflects the physician's knowledge of pharmacology and pathophysiology of diseases but also his/her skill in diagnosis and attitude towards selecting the most appropriate cost effective treatment (Adiga *et al*, 2009). The quality of drug prescribing is measured by organizing important predetermined criteria through drug utilization review (Prajapati and Bhatt, 2012).

Drug therapy is a major component of patient care management in health care settings, prescribers and consumers are flooded with a vast array of pharmaceutical products with innumerable brand names, available often at an unaffordable cost (Shankar *et al*, 2002). Irrational and inappropriate use of drugs in health care system observed globally is a major concern (Mirza *et al*, 2009), therefore analysis of indication-related drug prescription patterns is of particular interest with regard to rising costs of the health service (Hogerzeil, 1995). The study of prescribing patterns is a component of medical audit, which seeks monitoring, evaluation and necessary modification in the prescribing

patterns of prescribers to achieve rational and cost effective medical care (Dineshkumar *et al*, 1995). Drug utilization studies are needed to identify the trends as well as to set the priorities, not only in the interest of the regulatory control, but also as a basis of the planning program of education and information (WHO, 1993).

In order to improve drugs therapeutic efficacy, minimize adverse effects, and delay development of resistance, drug utilization trends and patterns need to be evaluated periodically (Jadhav *et al*, 2013), therefore the present study was undertaken to evaluate utilization pattern of drugs in a teaching hospital in Northern part of Nigeria.

### METHODS AND MATERIALS

This retrospective study was carried out at Bingham University Teaching Hospital and approved by the Hospital Health Research and Ethics Committee. The medical records of patients admitted into different wards of the hospital from January 1, 2011 to December 2011 was assessed. Information extracted from the records included age, sex, drug prescribed, their dosage, frequency, route of administration. Date of admission, source of admission, principal final diagnosis, and duration of hospitalization were also collected.

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### Exclusion Criteria

Patients less than 10 years, discharge patients against medical advice and dead patients were excluded from this study.

### Data Analysis

Data were also analyzed by using Microsoft excel sheet. The percentage for each of the parameters was calculated.

## RESULTS

A total of 417 medical records were analyzed. This admission comprised 93 (22.3%) males, 324 (77.7%) female with a male: female ratio of 1:4, most of the females were admitted in the month of March as shown in Fig.1

Table 1 shows the clinical diagnosis of the hospitalized patients. Other clinical diagnoses (58.0%) such as normal delivery, caesarean section and other gynecological diseases were the commonest cause of admission followed by cardiovascular diseases (CVD) (7.7%) and gastrointestinal diseases (6.5%).

The ages of the patients ranged from 10 - 50 years and above, majority (44.1%) of them were 20 to 29yrs. The most commonly affected system in the study was gynecological system (49.3%) as indicated in Fig 2.

Table 2 indicates number of prescriptions and drugs, average number of drug per prescription was found to be 5.1.

Other drugs had the highest prescribing prevalence (58.0%), followed by antimicrobials (30.7%) and followed by analgesics (22.3%) as indicated in Fig 3.

Prescribing prevalence of other drugs is shown in Fig 4, antianaemias had the highest prescribing prevalence (15.2%) while antiulcer (7.5%), anxiolytics (4.9%) and mydriatics (4.9%) ranked second and third on the list respectively.

13.1% of antimicrobials, 1.8% of antimalarials and 3.5% of antihypertensives were prescribed in trade name while 56.7% of the remaining drugs were prescribed in generic name and majority of them were other drugs as shown in Fig 5.

The pharmaceutical preparations of these drugs were presented in Fig 6. The drugs were mostly administered orally with 45.8%, followed by intramuscular (27.3%) and followed by intravenous preparations (23.0%).

## DISCUSSION

Drug utilization study is an essential part of pharmacoepidemiology which describes the extent, nature, and determinants of drug exposure with the ultimate goal to facilitate rational use of drugs in the population (Lee and Bergman, 2005). More females were admitted compared to males. This is in agreement with the study of Builders *et al* (Builders *et al*, 2014). An explanation for this could be due to most of them were with clinical conditions of normal delivery and caesarian section which top the list of hospital admission.

Majority of the patients admitted in the hospital were between 20-29 years because gynecological conditions such as normal delivery, caesarean section and other gynecological disorders were the commonest cause of admission. This finding is comparable to earlier report from Builders *et al* (Builders *et al*, 2014) there was no appreciable difference in cause of admission and the age distribution of the patients compared with that from Builders *et al* study (Builders *et al*, 2014). Cardiovascular disease mortality is top in the rank of mortality of related disease in both developing and developed countries (Foot *et al*, 2000). In developed countries, heart

disease is still the leading cause of death followed by cancer, despite the availability of more sophisticated technologies for the diagnosis and treatment and better management of CVDs, unlike in the developing countries where these are limited (Matters *et al*, 2009). In our report cardiovascular diseases ranked second on the list of clinical diagnosis of the patients, this report is similar to study conducted by Builders *et al* (Builders *et al*, 2014).

Average number of drugs per prescription is an important index as it tends to measure the degree of polypharmacy (Jadhav *et al*, 2013). It provides scope for review and educational intervention in prescribing practices (WHO, 1993).

In our study, the mean number of drug per prescription was 5.1, this study is similar to research conducted by Prakash *et al* (Prakash *et al*, 1989) and Ansari *et al* (Ansari *et al*, 1998) in which the numbers were found to be 5.86 and 5.05 medicines per prescription respectively in their studies. This figure is high and shows overprescribing and polypharmacy. It is preferable to keep the mean number of drug per prescription as low as possible. Since, the highest figures always lead to increased risk of drug – drug interaction (Ansari *et al*, 1998).

Drug utilization studies are important for obtaining data about the patterns and quality of use, the determinants of drug use, and the outcomes of use. In this study twenty three different groups of drugs were encountered in the hospital, they ranged from antimicrobials to infusions. Other drugs had the highest prescribing prevalence and these varied from antidiabetes to infusions with antianaemials topping the list.

Several classes of antimicrobial agents have been discovered and hundreds of them are available today. Antimicrobial agents are lifesaving in many conditions. With the advent of antibacterial therapy death from an incurable bacterial infection is considered a thing of the past (Prajapati and Bhatt, 2012). These drugs are the most widely used category of drugs in the world accounting for over one quarter of hospital drug costs (Jain *et al*, 2011).

Antimicrobials were massively utilized in our study by ranking second in prescribing prevalence, the high use of antimicrobial may reflect the severity of infections and the choice of these drugs depend on some factors which include the patient profile, type of infection, availability of antimicrobial, susceptibility patterns, the prescriber's awareness on rational antimicrobial use etc. (Smith *et al*, 1991).

The introduction of analgesic drugs was a landmark event and soon these drugs become the most widely used medications not only for the relief of pain and fever but also for their anti-inflammatory effect. Apart from that, these pain killers are most widely used; they are the abused class of drugs worldwide (Builders and Aguwa, 2012). The choice of analgesic is governed by the severity of pain, the individual needs and the circumstances of the patient (Builders *et al*, 2011). Analgesics were mostly consumed since they had high prescribing prevalence.

WHO recommends that in promoting rational use of drugs, drugs should be prescribed in their international non-proprietary names (Meremikwu *et al*, 2007). Prescribing drugs by generic name makes the treatment low cost and rational as it avoids prescription writing errors and confusion of dispensing of different brand names which sound alike and spell similar (Nehru *et al*, 2005).

Though, some factors that might be responsible for prescribing in brand names include; influence of drug promotional activities, pressures of pharmaceutical detailing men, lack of continuing education on the principles of rational prescribing and non-familiarity with generic names among prescribers (Eze *et al*, 2007).

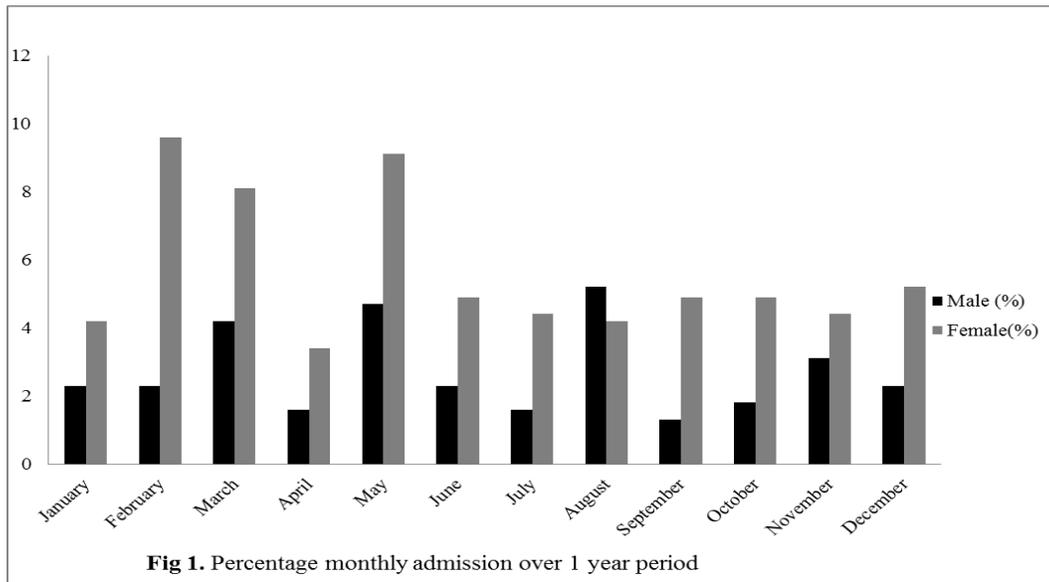


Fig 1. Percentage monthly admission over 1 year period

Table 1: Clinical diagnoses of the patients

Infection	Patients (%)	Non-infection	Patients (%)	Associated diseases	Patients (%)
Malaria	19 (4.6)	CVS	32 (7.7)	RVD+PTB	1 (0.2)
Typhoid fever	11 (2.6)	CNS	13 (3.1)	RVD+HT+Anaemia	1 (0.2)
Retroviral disease	6 (1.4)	Endocrine	9 (2.2)	RVD+Hepatitis	1 (0.2)
Meningitis	7 (1.7)	GIT	27 (6.5)	HT+Anaemia	1 (0.2)
Pneumonia	5 (1.1)	Renal	5 (1.2)	CVS+CCF	1 (0.2)
RTI	4 (1.0)	Liver	2 (0.5)	DM+HT	1 (0.2)
Tuberculosis	8 (1.9)	Haematological	3 (0.7)	HT+CLD	1 (0.2)
UTI	4 (1.0)	Malignancy	3 (0.7)	DM+CSM	1 (0.2)
Cholera	4 (1.0)	Others	242 (58.0)		
PID	5 (1.2)				

Keys: RTI; Respiratory Tract Infection, UTI; Urinary Tract Infection, PID; Pelvic Inflammatory Disease, CVS; Cardiovascular System, CNS; Central Nervous System, GIT; Gastrointestinal Tract, RVD; Retroviral disease, PTB; Pulmonary tuberculosis, HT; Hypertension, CCF; Cardiac Failure, DM; Diabetes Mellitus, CLD; Chronic Liver Disease, CSM; Cerebrospinal Meningitis.

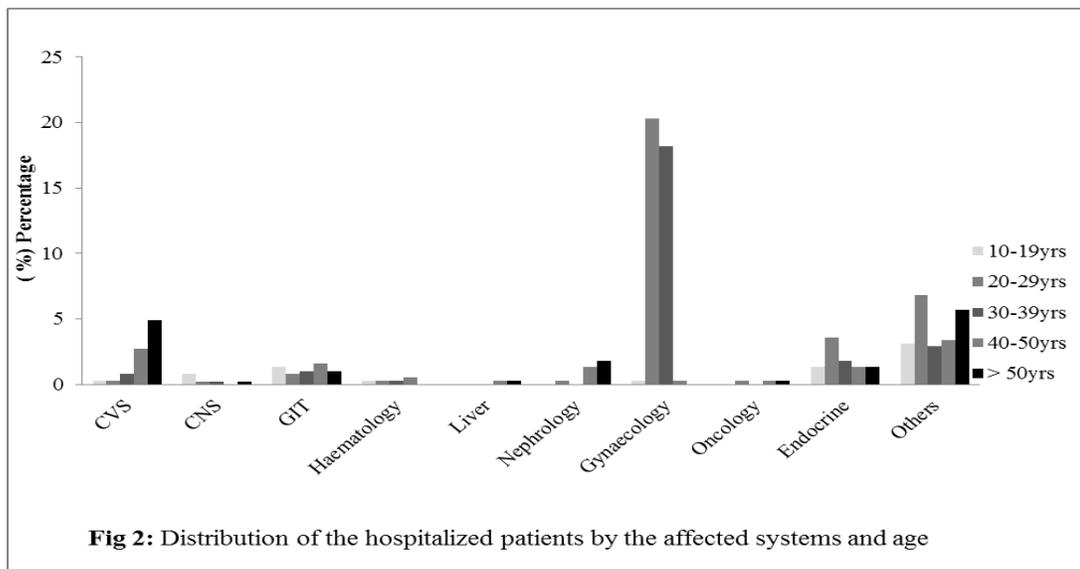
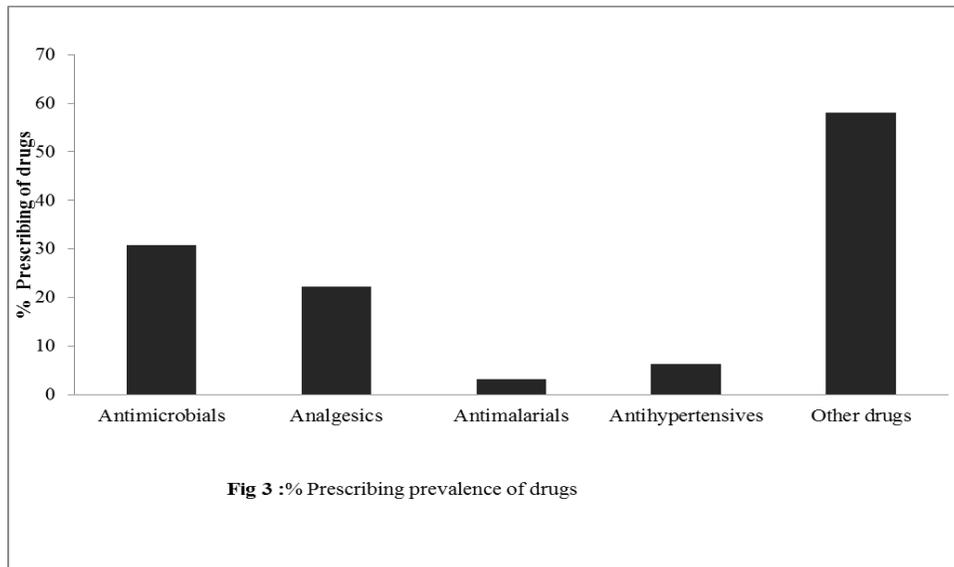


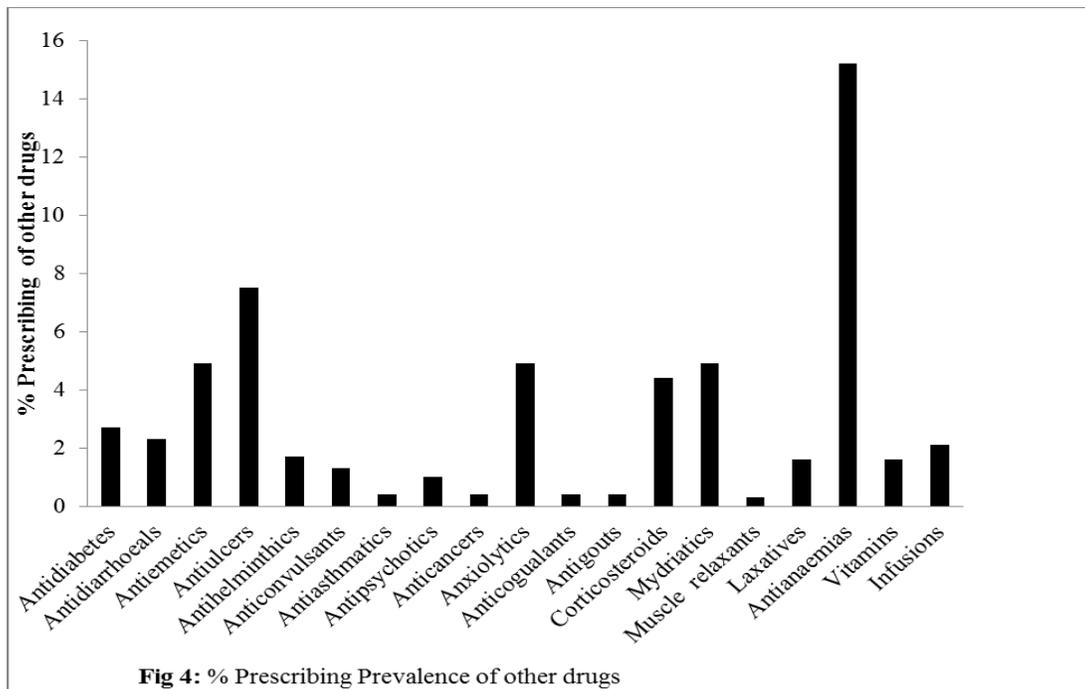
Fig 2: Distribution of the hospitalized patients by the affected systems and age

**Table 2:** Number of prescriptions and drugs

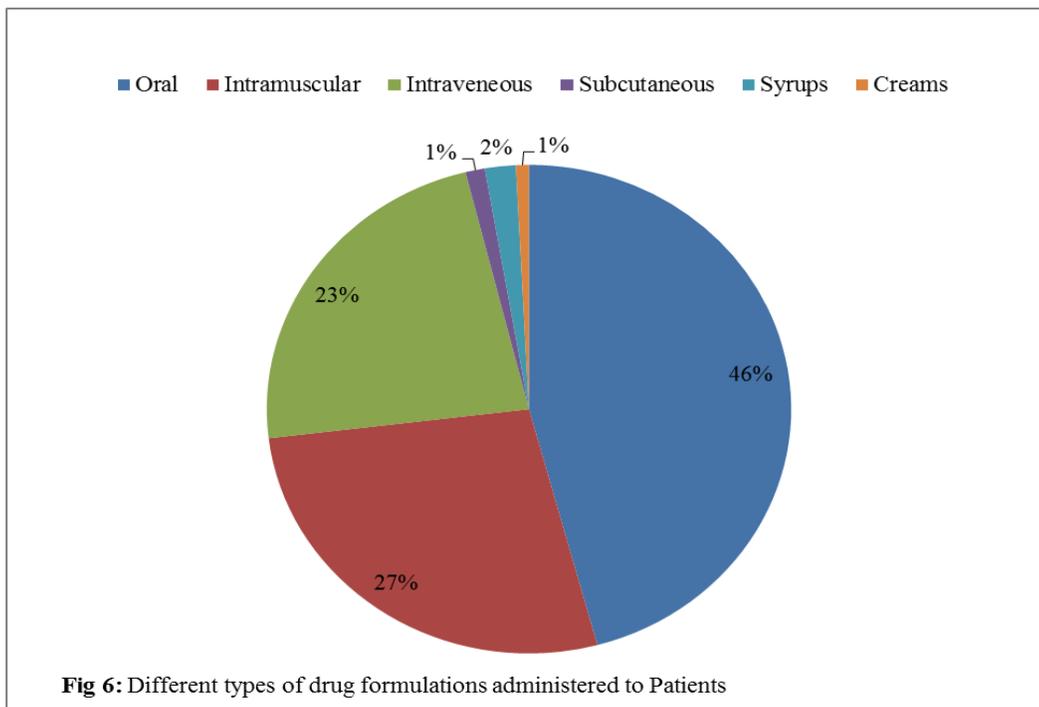
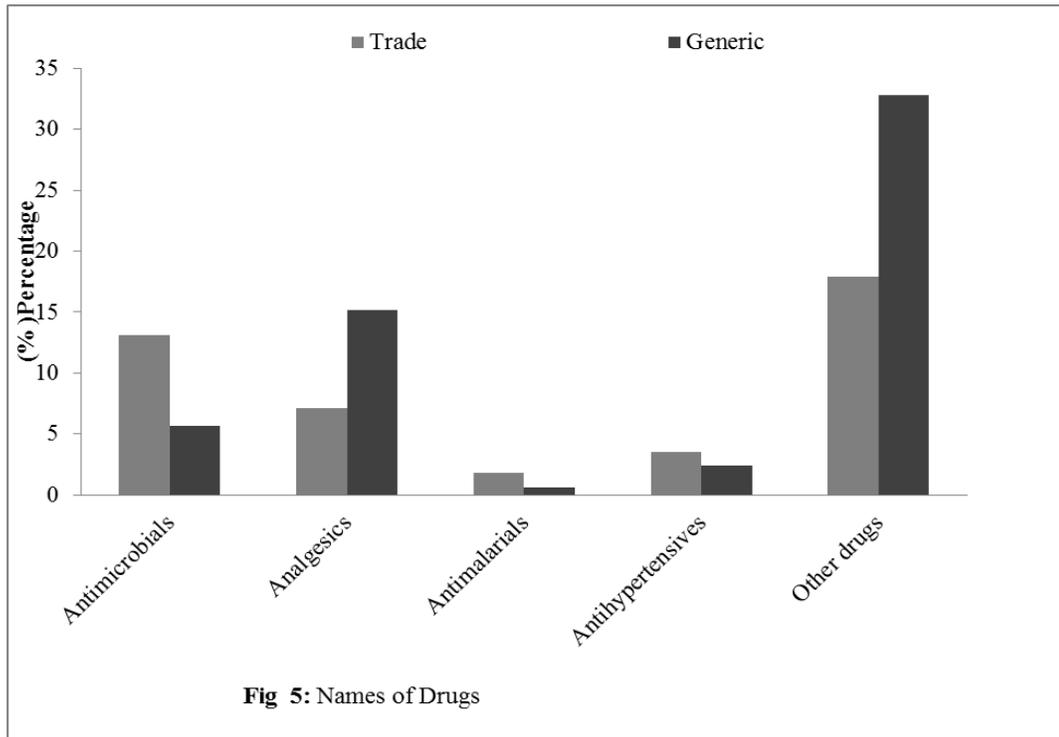
Month	Number of Prescriptions	Number of Drugs
January	25	138
February	45	241
March	54	271
April	20	109
May	56	296
June	33	141
July	25	134
August	40	201
September	29	159
October	28	125
November	30	141
December	32	171
Total	417	2127



**Fig 3 :** % Prescribing prevalence of drugs



**Fig 4:** % Prescribing Prevalence of other drugs



The percentage of antimicrobial, antimalarial and antihypertensive drugs prescribed in trade name was high while the percentage of all the drugs prescribed in generic name was higher than those prescribed by brand name. The use of generic name should be encouraged as it leads to the dispensing of the appropriate product (unless there is a

problem of drug bioavailability, in which case the patient should receive the specified product) (Yousif *et al*, 2005).

In this study half of the drugs were prescribed for parenteral administration. Pharmacokinetics and clinical trials indicated that oral forms of drugs are effective as injections, with oral medications more cost effective and also increase the

risk of blood borne infections (Prajapati and Bhatt 2012, NSW, 2002).

### LIMITATION OF THE STUDY

The study had a number of limitations which include retrospective design, lack of patient care indicators and paediatric department.

### CONCLUSION

This study has shown a pattern of drug utilization and this indicates scope for promoting rational prescribing and drug use in the hospital.

### ACKNOWLEDGEMENT

We appreciate the support and cooperation of the staff of Bingham University Teaching Hospital.

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