

Study of Financial Implication of Prescriptions in Acute Fever by Medical Practitioners in Pune City

Dr. Kushal D. Sarda^{1*}, Dr. Kapil S. Khade², Dr. Shirish G. Beri³, Dr. (Mrs.) Vijaya A. Pandit⁴

MBBS MD Pharmacology - Resident¹, MBBS MD Pharmacology - Resident², MBBS MD Pharmacology – Assist. Professor³, MBBS MD Pharmacology – Prof and HOD⁴. Postal address – Department of Pharmacology, Bharati Vidyapeeth Deemed University Medical College, Katraj, Pune – 43.

e-mail: kdsarda@gmail.com

Subject: Pharmacoeconomics

Abstract

A cross sectional, prospective study was carried out in MBBS and BAMS medical practitioners doing allopathic practice in Pune city. 400 prescriptions of patients suffering from acute fever were collected from practitioners. MBBS and BAMS practitioners registered with IMA, Pune were divided according to their area of practice into North, South, East, West and Central zones of Pune city. 2 practitioners per zone per qualification were selected randomly, 20 encounters of acute fever were collected from each practitioner. Data was collected using questionnaire similar to case record sheet. The data was analyzed for cost of drugs per prescription. The average cost per prescription of BAMS practitioners was Rs 117.29 where as that of MBBS was Rs 87.39. Group and diagnosis wise cost per prescription was significantly higher in BAMS practitioners in comparison to MBBS practitioners. Financial implication of prescriptions in acute fever was much higher with BAMS as compared to MBBS practitioners.

Key words – Cost analysis, Rational drug use, General Practitioners, Antimicrobials, NSAIDs, and Prescriptions.

Introduction

The patient approaches doctor with complaints and with the belief that he would be relieved of all his problems. It is doctor's responsibility to hear all the complaints patiently, examine the patient, diagnose the cause of his problems, formulate treatment goals and decide which drugs should be used before writing any prescription.^[1] Communicating with patients is an art and writing a prescription is science.^[2]

Many factors may affect prescribing practice leading to irrational drug use like- pressure from patients,^[3] pressure from pharmaceutical industry,^[4] knowledge of the doctor, availability of unbiased information,^[5] etc. Impact of irrational drug use is many folds- it reduces quality of care, increases cost, increases risk of adverse drug effects in addition to waste of resources.

The demand and the cost of health care are increasing in all countries as there is improvement in living standard and sophistication of health technologies. Cost of medicines are growing constantly as new medicines are marketed and are under patent law, preference of drug therapy over invasive therapy, discovering various off label uses of existing drugs^[6] and the irrational drug prescription. All over the world patients are affected by high price of medicines. In a developing country like India 85% of total health expenditure is financed by house-hold out-of-pocket expenditure.^[7] Many poor people frequently face a choice between buying medicines or buying food or other necessities due to limited resources and high pricing of drug. So medicine prices do matter.^[8] So, in

India, where there are financial constraints on health care provisions, economic evaluation of management of diseases is meaningful.^[9]

Many studies are carried out to measure cost burden of prescriptions in specified health facilities, e.g. Govt. dispensaries, Primary Health Centers, Tertiary Health Care Centers etc. Not many studies are carried out to measure cost burden of prescriptions in general practice.^[10] Most of the common ailments are managed by medical or general practitioners (GPs). GPs prescribe major bulk of the drugs sold in the market.^[11]

Fever is the most common complaint with which patients present to general practitioners. Fever is presenting symptom of many illnesses. Patients suffering from acute fever i.e. fever of less than 2 weeks duration are usually treated by GPs. The routine use of antipyretics given automatically in all cases of fevers not only masks fever but also other important clinical indicators giving lead to diagnosis. Therefore, too much aggressive treatment of acute fevers leads to misuse of antipyretics. Similar is the story of the use of antibiotics, acid reducing agents and antihistaminics.

General Practitioners in Pune city have MBBS, BAMS, BHMS and other qualifications but MBBS and BAMS dominate the scene. So, the present work was undertaken to study Financial Implication of Prescriptions in Acute Fever by Medical Practitioners in Pune City with MBBS and BAMS qualifications.

Methodology

This was a prospective, cross-sectional, comparative study to evaluate average drug cost per prescription, compare cost for different groups of drugs per prescription and average cost per prescription as per diagnosis in GPs of Private Sector Dispensaries in Pune city.

Selection of practitioners:

List of GPs in Pune city who were registered with Indian Medical Association (IMA), Pune Branch was obtained. Pune city was divided into five zones – North, South, East, West and Central zone. MBBS and BAMS practitioners were divided zone wise. Two practitioners of both specialties from each zone were selected randomly using online software (www.randomizer.org). This gave us ten MBBS and ten BAMS practitioners spread over Pune city.

Informed Consent: -Selected GPs were approached and explained in detail the purpose of the study, method of conduct and analysis of the study. They were explained that their identity would not be revealed and the data would be used for research purpose only. On willingness to participate in the study, informed consent was obtained. If any practitioner refused to participate, another one was selected randomly from the practitioners list.

Data Collection:

A proforma was designed to collect the data of drug use in acute fever. It included patient's demographic details (name of the patient was optional), presenting complaints of the patient, findings on examination and provisional diagnosis. Drug treatment-prescribed and dispensed on first visit- was obtained in detail.

Patient Selection:

Inclusion criteria - Patients of either sex of any age with fever less than two weeks duration
Exclusion criteria –

1. History of recurrent attacks of acute fever
2. Patients with H/O HIV/AIDS and Use of drugs- corticosteroids or anticancer agents.

Number of Patients:

Data was collected from 20 patients per prescriber. So, data of 400 patients was collected.

Indicators studied:

1. Average drug cost per prescription,
2. Compare cost for different groups of drugs per prescription,
3. Average drug cost per prescription as per diagnosis.

Ethics: The study was approved by Institutional Ethics Committee (IEC)

Study duration: study was carried out from June to September 2012.

Statistical Analysis: Data was entered on Excel sheet. Separate sheets were prepared for MBBS and BAMS practitioners. Patients from individual practitioners were grouped and arranged serially. All drugs were coded and entered. Details of each patient were entered in one row and columns indicated the diagnosis and details of all the drugs prescribed.

Cost was analyzed in detail with help of locally available formularies like Current Index of Medical Specialties (CIMS), India. July-October 2012 and Drug Today, India July-September 2012. Comparison of cost between MBBS and BAMS GPs prescription was analyzed by student's 't' test using z test. Number

of prescriptions for various class of drugs according to range of cost was analyzed by Chi-square test using GraphPad Prism version 6.00 for Windows, GraphPad Software, La Jolla California USA, www.graphpad.com. P value < 0.05 was considered significant.

Results:

The distribution of encounters, age wise as well as sex wise from both the groups of GPs were

comparable. Viral fevers and respiratory infections [Upper Respiratory Tract Infection (URTI) and Lower Respiratory Tract Infections (LRTI)] were most common infections in general practice. Then Urinary Tract Infection (UTI), Acute Gastroenteritis (AGE) each composed of only 5% of infections. Skin and Soft Tissue Infections (SSTI) in the form of boils, cellulitis were seen by MBBS GPs only. Other infections included Malaria, Chickenpox and Mumps. (Fig. 1)

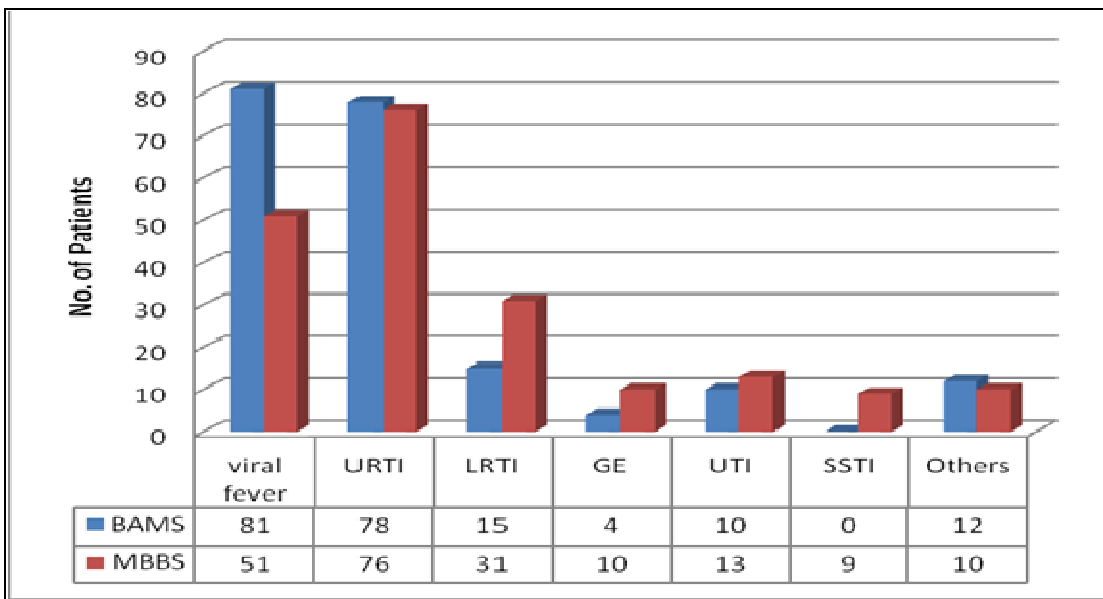


Figure 1. Diagnosis Wise Distribution of Patients

Fig. 2. Shows average drug cost per prescription for BAMS and MBBS GPs. In case of BAMS GPs, patient had to spend average Rs 117.29 (US\$ 2.14) as compared to MBBS GPs where patient had to spend Rs 87.39 (US\$ 1.59).

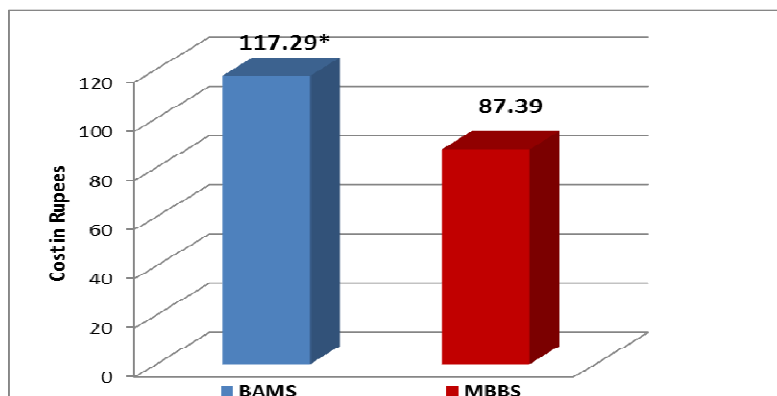


Figure 2. Average Drug Cost per Prescription.
*p=0.042 z score = 1.73

Table 1. Shows range of cost of antimicrobials and number of patients in which these AMAs were used by BAMS and MBBS GPs. Overall use of AMAs was high in BAMS GPs as compared to MBBS GPs. Costly AMAs > 101 Rs were used by BAMS GPs.

Table 1: NUMBER OF PRESCRIPTIONS OF ANTIMICROBIALS (AMAs)

Antimicrobials	BAMS	MBBS	Chi square (χ^2)	p value
High (>101Rs)	40(22.47)	28(20.29)	0.1530, df-2	p=0.98
Medium(51-100Rs)	76(42.70)	67(48.55)	0.6487, df-2	p=0.88
Low (<50Rs)	62(34.83)	43(31.16)	0.2619, df-2	p=0.96
Total	178	138	12.64, df-2	p=0.005**

Values in parentheses are in percentages (%). **p<0.01

Table 2. Shows range of cost of NSAIDs and number of patients in which these NSAIDs were used by BAMS and MBBS GPs. Again overall use of NSAIDs was high by BAMS GPs in comparison to MBBS GPs. Costly NSAIDs i.e. > 31Rs was used by BAMS GPs.

Table 2: NUMBER OF PRESCRIPTIONS OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDs)

NSAIDs	BAMS	MBBS	Chi square (χ^2)	p value
High (>31Rs)	22(12.29)	05(3.48)	4.540, df-2	p=0.20
Medium(16-30Rs)	39(21.79)	41(28.48)	0.835, df-2	p=0.84
Low (<15Rs)	118(65.92)	98(68.04)	0.113, df-2	p=0.99
Total	179	144	10.64, df-2	p=0.014*

Values in parentheses are in percentages (%). *p<0.05

Table 3. Shows range of cost of acid reducing agents and number of patients in which these acid reducing agents were used by BAMS and MBBS GPs. Overall use of these agents was high in BAMS GPs as compared to MBBS GPs.

Table 3: NUMBER OF PRESCRIPTIONS OF ACID REDUCING AGENTS

Acid Reducing Agents	BAMS	MBBS	Chi square (χ^2)	p value
High (>21Rs)	37(41.57)	06(21.43)	1.77, df-2	p=0.62
Medium(11-20Rs)	15(16.86)	16(57.14)	8.63, df-2	p=0.03*
Low (<10Rs)	37(41.57)	06(21.43)	1.77, df-2	p=0.62
Total	89	28	23.41, df-2	p<0.0001****

Values in parentheses are in percentages (%). *p<0.05 **** p<0.0001

Table 4. Shows range of cost of antihistaminics and number of patients in which these antihistaminics were used by BAMS and MBBS GPs. Low cost antihistaminic Chlorpheniramine maleate was commonly used by BAMS GPs.

Table 4: NUMBER OF PRESCRIPTIONS OF ANTIHISTAMINICS

Anti - Histaminics	BAMS	MBBS	Chi square (χ^2)	p value
High (>15Rs)	19(16.97)	11(20.75)	0.090, df-2	p=0.99
Medium(8-14Rs)	17(15.18)	27(50.94)	11.27, df-2	p=0.011*
Low (<8Rs)	76(67.85)	15(28.31)	11.32, df-2	p=0.012*
Total	112	53	17.82, df-2	p=0.0005***

Values in parentheses are in percentages (%). *p<0.05 ***p<0.001

Fig. 3. Shows average drug cost per prescription as per diagnosis. In viral fever, URTI, LRTI, AGE and UTI, the average cost of prescription by BAMS GPs was much high as compared to MBBS GPs. In other diseases, MBBS GPs prescription was high in terms of cost.

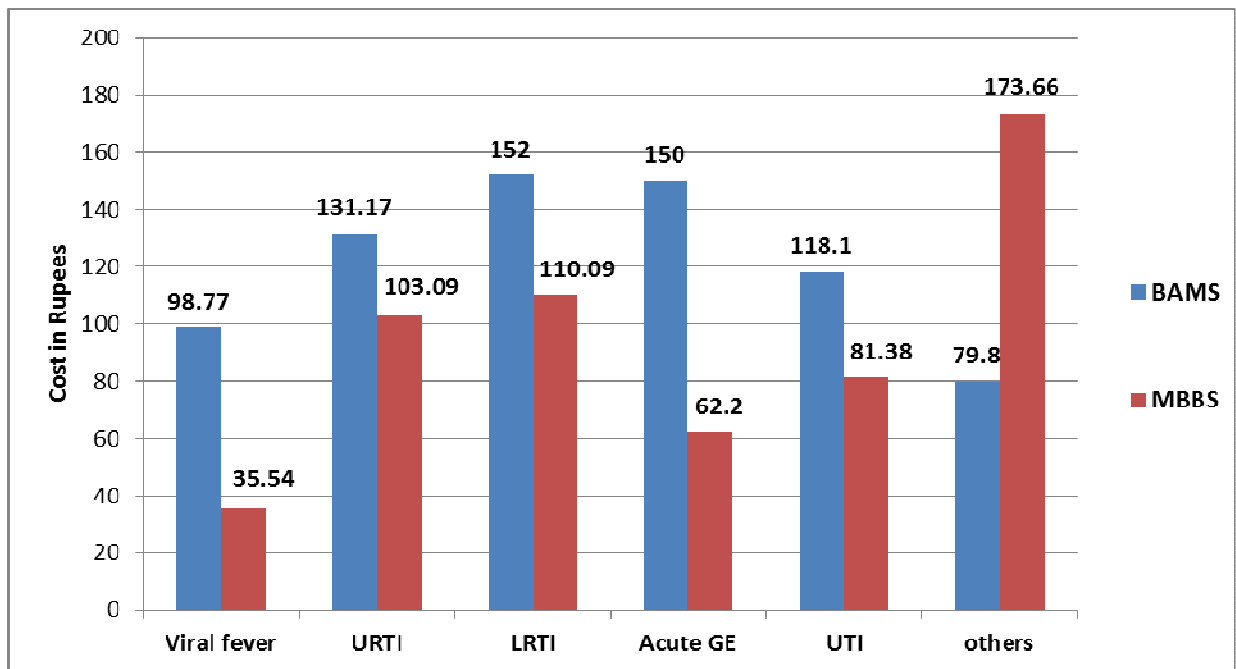


Figure 3. Average Drug Cost per Prescription as per Diagnosis

Discussion:

Present study was a prospective, cross sectional, comparative study to evaluate cost of drugs per prescription in General Practitioners (GPs) of Private sector dispensaries in Pune city. More than 60% of drug use studies are carried out in public sector.^[10] Very few studies are carried out in primary care providers in private sector. 4 MBBS and 3 BAMS practitioners refused to participate in the study. Same numbers of practitioners were selected again by random sampling. 20 patients of fever were selected from each practitioner to get total 400 patients. Data was collected using pre designed questionnaire similar to a case record sheet.

Age and sex wise distribution of patients was almost equal in both GPs. 60% of age group presenting to GPs was Adult (age 19-60). Diagnosis wise distribution of patients was also comparable across both GPs (Fig. 1). Viral fever and Upper Respiratory Tract Infection (URTI) were common cause of fever encountered.

The average drug cost per prescription was Rs 117.29 (US\$ 2.14) in BAMS GPs as compared to MBBS GPs where patient had to spend Rs 87.39 (US\$ 1.59).(Fig 2) Though this amount is not very high when compared to some international studies in developing countries like Nepal^[12] where average drug cost per prescription was found to be Nepalese rupees (NRs) 285.99 (INR 178.63, US\$ 3.73), average drug cost per encounter in Nigeria^[13] was found to be N 1224.38 (INR 425, US\$ 7.91) and in Pakistan^[14] it was Pak. Rs. 133.41(INR 75.71, US\$ 1.38). But when compared to some Indian studies like Hazra et al^[15] (Rs 74.19). and Mhetre et al^[16] (Rs 91.5), definitely the average drug cost per prescription was high in the BAMS and MBBS GPs. BAMS GPs prescriptions were more costly compared to MBBS GPs (p=0.042).

This may be due to general tendency amongst many practitioners to prescribe the latest, the more expensive and heavily promoted agents as first line of therapy rather than older, less expensive and equally effective drugs.^[17] Pharmacoeconomics are now extremely important key factor in health management from last decades. The cost of medications is one of the key barriers for accessing medications in developing country.^[18] In our study antibiotics contributed maximum of total drug cost as they

were the most common drug prescribed. The high cost of medications especially antibiotics, directly affect poorest and most vulnerable population such as children that leads to non-compliance, morbidity and mortality.^[19]

1. Antimicrobials (AMAs) :

Overall total use of AMAs was high in BAMS GPs as compared to MBBS GPs (p=0.005). 178 out of 200 prescriptions by BAMS GPs contained AMAs whereas 138 out of 200 by MBBS GPs. Considering the range of price of AMAs, both the GPs prescribed equal number of drugs at high (>101Rs), medium (51-100Rs) and low (<50Rs) cost. In our study we found that AMAs were the costly component of drugs prescribed. More than 20 % of patients received high cost AMAs (>101Rs) by both BAMS as well as MBBS GPs which is comparable with studies done by Akhtar et al^[18] (Rs113.72) and Ahmad et al^[20](Rs 84.5)

BAMS GPs prescribed Cephalosporins to 30% of patients, the most commonly used Cephalosporins were Cefixime, Cefpodoxime and Cefuroxime axetil which are costly and not recommended as first line drugs in acute fever.^[21]

Although fever is common presenting complaint of viral infections, it was observed that practitioners prescribed AMAs consistently, which is highly irrational.^[22] Costly AMAs leads to non-compliance of treatment, as patients on most of the time do not take medicines from pharmacist for full duration of treatment. This non-compliance may lead to antimicrobial resistance and bear serious consequences.

2. NSAIDs:

Total use of NSAIDs in patients of fever by BAMS GPs was high as compared to MBBS GPs (p=0.014). Costly NSAIDs (>31Rs) was used more by BAMS GPs. In Bangladesh investigators observed that the cost of analgesic agents per prescription (Bang. Tk 60.40, INR 35.46) was expensive.^[23] In our study also, BAMS GPs prescribed expensive NSAIDs to more than 12% patients. The expensive NSAIDs included drugs like Tramadol and Lornoxicam.

3. Acid Reducing Agents :

Total use of acid reducing agents was much higher by BAMS GPs as compared to MBBS GPs (p<0.0001). Costly agents were used by BAMS GPs (>21 Rs) more when compared to MBBS GPs. The costly agents were mainly

combination of acid reducing agent with antiemetic such as Pantoprazole with Domperidone and were mainly used as prophylaxis to reduce acidity by NSAIDs.

4. Antihistaminics :

Total use of antihistaminics was also high with BAMS GPs as compared to MBBS GPs ($p < 0.0005$). Second generation antihistaminics like Levocetirizine and Cetirizine were commonly used by MBBS GPs which are costly whereas BAMS GPs preferred low cost first generation antihistaminic like Chlorpheniramine maleate.

As per diagnosis we also calculated average cost a patient has to spend on prescription. From figure 3 we can see BAMS GPs prescriptions were costly in viral fever, URTI, LRTI, AGE and UTI conditions whereas MBBS GPs prescriptions were costly in other conditions like Skin and Soft Tissue Infections (SSTI), Malaria, Mumps and Chickenpox.

Our study had many limitations. The study was carried out over a four-month period, and seasonal variations in disease pattern were not considered. Further, the number of patients as well as number of doctors in our study was low and the study was restricted to only BAMS and MBBS GPs.

To conclude, our study has used Cost-analysis method to highlight the current status of treatment practices of general practitioners in Pune city. There are deficiencies in prescription practices among BAMS and MBBS general practitioners. Not only are general practitioners prescribing the costliest number of drugs, antibiotics per prescription anywhere, their prescription practices for common health problems like Acute Respiratory Infections, Acute Gastroenteritis and Viral Fever are highly costly. So the attitude towards prescribing of GPs in the highest prescribing costs for patients surely needs an educational intervention which will benefit the community by reducing cost.

Acknowledgments

The author's thank the Indian Medical Association, Pune Branch for providing all the necessary support and co-operation. The total responsibility of research work is of Author only if any person or group of person or organization or institute having any kind of objection, comments, and/or suggestions he/she should contact to author only.

Cite this article"

K. Sarda, K. Khade, S. Beri, V. Pandit "Study of Financial Implication of Prescriptions in Acute Fever By Medical Practitioners in Pune City" *Int. J. of Pharm. Res. & All. Sci.* 2013; Volume 2, Issue 1,75-82

References

1. World Health Organisation. Guide to Good Prescribing: A practical manual. Action programme on essential drugs: WHO, Geneva; WHO/DAP/94.1:1-4.
2. Saunders J, The practice of clinical medicine as an art and as a science, *West. J. Of Med*, 2001; 174(2):137-141.
3. Bradly CP, Uncomfortable prescribing decision a critical incident study, *British Medical Journal*, 1992; 304:294-6.
4. Bradly C and Holbs R, Attemperatures to influence prescribing in UK, In: Bradly CP and Hobbs FDR. Prescribing in primary care: Oxford General Practice Series: 42; Oxford University Press; 1998:1-2.
5. Baqui QBOF, Begum HA. Rational use of drug-strategy and perspective in context of developing country. In: Mir Misbahuddin, Rabiulislam, editors. General Principal of Pharmacology. 4th ed. Books and allied Ltd., Calcutta, 1999: 154-161.
6. Cooke J, Pharmacoeconomics –Clinical Pharmacy and Therapeutics, 2003:91-98.
7. Godwin SK, Varatharajan D, Drug price differentials across different retail market setting, *Health Administrator*, 2007; 1: 41-47.
8. Hinchagri SS, Halakatti PK, Devar SB, Biradar B, Kankanwadi SK, Patil S, Need Of Pharmacoeconomics In Indian Health Care System: A Brief Review ; Available at <http://www.pharmatutor.org/articles/brief-review-need-of-pharmacoeconomics-in-indian-health-care-system> last accessed 5/11/12.
9. Emery P, Review of Health Economics Modeling in Rheumatoid Arthritis. *Pharmacoeconomics*, 2004; 22(2 Suppl I): 55 – 69.
10. Figueiras A., Caamano F, Gestal Otero J, Methodology of Drug Utilization Studies in Primary Health Care, *Gac Sanit*, 2000; 14(3):7-19.
11. General Practitioner: Wikipedia. Available from:

- URL:http://en.wikipedia.org/wiki/General_Practitioner. Last accessed 5.11.2012.
12. Ghimire S, Nepal S, Bhandari S, Nepal P, Palaian S, A prospective surveillance of drug prescribing and dispensing in a teaching hospital in Western Nepal, *J Pak Med Assoc*, 2009; 59(10):726-31.
 13. Okah A, An Assessment of Rational Drug Use in Public Tertiary Hospitals in Edo State, Nigeria. Available at <http://www.ghf12.org/?p=2834> last accessed 6/11/12.
 14. Das N, Baloch H, Khan AN, Badini ZA, Parkash J, Prescribing Practices of Consultants at Karachi, Pakistan, *JPMA*, 2001; 51:74.
 15. Hazra A, Tripathi SK, Alam MS, Prescribing and dispensing Activities at the Health Facilities of a Non-Governmental Organization, *The National Medical Journal of India*, 2000; 13(4):177-82.
 16. Mhetre NA, Bodhankar SL, Pandit VA, Zambare GN, Study of Pattern of Drug Usage in an Urban Area, *Indian Journal of Pharmacology*, 2003; 35: 316-317.
 17. Jones DL et al, Cost saving using a stepped-care prescribing protocol for Nonsteroidal Anti-inflammatory drugs, *JAMA*, 1996; 275: 926-930.
 18. Akhtar et al, Drug Prescribing Practices in Paediatric Department of a North Indian University Teaching Hospital, *Asian J Pharm Clin Res*, 2012; 5(1):146-149.
 19. Guyon AB, Barman A, Ahmed AU, Alam MS., A baseline survey on use of drugs at the primary health care level in Bangladesh, *Bull WHO* 1994; 72: 265-271.
 20. Ahmad et al, A Study on Utilization Pattern of Higher Generation Antibiotics among Patients Visiting Community Pharmacies in Chidambaram, Tamil Nadu at South India, *Int J Pharm*, 2012; 2(3): 466-471.
 21. Tiernay LM, Papadakis MA, Mcphee SJ. *Current Medical Diagnosis & Treatment: McGrawHill*, New York. 51st ed.; 2012.
 22. *Rational Use of Drugs and Evidence based Medicine*. Available at <http://www.scribd.com/doc/49159624/Rational-Use-of-Drugs> last accessed on 5/11/2012.
 23. Rehman et al, Prescribing pattern of non-steroidal anti-inflammatory drugs at outpatient departments of teaching hospitals, *Bangladesh J Pharmacol*, 2007; 2(1):1-6.
-