A study of prescription auditing in rural health care setting of north India

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Abstract

Background: Prescription audit is a quality improvement process that seeks to improve patient care. It supports health professionals in making sure their patients receive the best possible care. In this background, this study was conducted in rural health-care settings in North India.

Objective: To assess prescription pattern in primary and secondary health-care facilities of North India.

Materials and Methods: This observation study was undertaken for a period of 1 year and data were collected from 500 prescriptions collected from various outpatient departments of primary and secondary health-care facilities.

Result: Most common diagnosis was diseases of respiratory system (28.3%). Among therapeutic classification, drugs most commonly used were antimicrobials (20.87%) and most common antimicrobial was penicillin at the rate of 31.7%. Among penicillin combination of amoxycillin and clavulanic acid was most commonly prescribed. A total of 96.3% encounters were having single antimicrobials. Of all, 61.8% prescriptions contained fixed-dose combinations in which combination of expectorants and cough suppressants was most common.

Conclusion: Many of the prescribing trends from this study are a cause of concern and need attention. The value of such audits in generating and testing hypothesis on inappropriate prescribing will definitely create an intervention to improve prescribing habits and ultimately patient care will be improved.

KEY WORDS: medical audit, demography, morbidity, therapeutic class, fixed-dose combination

Introduction

Rational drug use emphasizes on the patients' access over appropriate medication as per their clinical demand, in doses meeting their individual requirement with sufficient period of time being cost effective with them and community.[1,2]

The quality of life in developing countries can be improved by enhancing the standards of medical treatment at all levels of the health-care delivery systems. Medical audit oversees the observance of these standards.[3] Their scope is to evaluate the present state and future trends of drug usage, to estimate crudely the disease prevalence, drug expenditure, appropriateness of prescriptions, and adherence to evidence-based recommendations. The increasing importance of drug utilization studies as a valuable investigation resource in pharmacoepidemiology has been bridging it with other health-related areas such as pharmacovigilance, pharmacoeconomics, and pharmacogenetics.

Different studies conducted on the prescription auditing in different parts of the world produce their own database for the future comparative studies.[4] So this study was conducted in rural areas of North India to create our own database for future comparative study on the auditing.

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Materials and Methods

This observational, prospective, pharmaco-epidemiological study was conducted over a period of 1 year from November 2013 to October 2014. The study was initiated after obtaining the necessary approval from the Institutional Ethics Committee, Government Medical College, Jammu. Patients attending outpatient department (OPD) at different disciplines in CHC RS Pura, PHC Dabehar and AD Miran Sahib were enrolled. Each participant was interviewed for demographic details on a prestructured proforma. The questionnaire was first pilot tested on a small sample of patients for standardization and further necessary changes were made as per requirement.

A total of 500 prescriptions were taken, copied, and analyzed as per the WHO core prescribing indicators[5]:

- Demographic characteristic of the patients involved
- Morbidity pattern of study population
- Therapeutic classification of drugs prescribed
- Pattern of antibiotic based on class and name
- Number of antibiotics prescribed per encounter
- Number of fixed-dose combination prescribed
- Any banned formulation in the prescription

Result

In this study of 500 prescriptions done over a period of 1 year, the sociodemographic characteristics of the patients are shown in Figure 1.

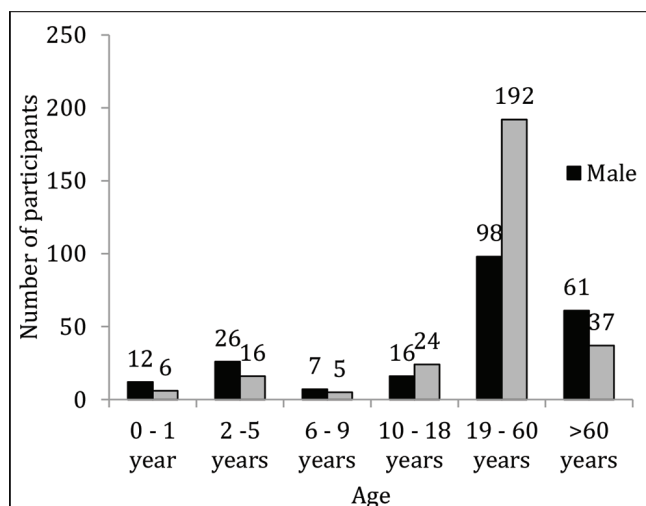### Morbidity Pattern of Study Population

In 500 presciptions analyzed, most common diagnosis encountered was of respiratory system (28.3%), followed by diseases of digestive system (15.3%) and musculoskeletal system (12%). Less common were diseases of cardiovascular system (10.9%), diseases of endocrine system (7.3%), and genitourinary system (6.16%). Least common were diseases of skin (5.28%) as shown in Table 1.

Therapeutic Classification of Drugs Prescribed

Among all prescribed drugs in 500 prescriptions, most frequently prescribed were antimicrobials (20.87%) followed by drugs for respiratory system (16.44%), antiulcer drugs (15.56%), multivitamins (13.09%), cardiovascular drugs (7.64%), and drugs for endocrine system (5.96%). Least prescribed were drugs for skin (4%) and central nervous system disorders (3.5%) as shown in Table 2.

Pattern of Antimicrobials based on Class and Name

In our study, most commonly prescribed antibiotic was from penicillin group. Among penicillins, combination of amoxicillin and clavulanic acid was most commonly prescribed followed

Figure 1: Age and sex distribution of the study population.

Table 1: Morbidity pattern of study population

Disease pattern	Number	%
Diseases of respiratory system	161	28.3
Diseases of digestive system	87	15.3
Diseases of musculoskeletal system	72	12.67
Diseases of CVS	62	10.9
Diseases of CNS	14	2.46
Diseases of skin	30	5.28
Diseases of genitourinary system	35	6.16
Diseases of endocrine system	42	7.39
Others	65	11.44
Total	568*	100

Table 2: Therapeutic classification of drugs prescribed

| Therapeutic classification	Number	%
Antimicrobials	287	20.87
Respiratory system	226	16.44
Antiulcer drugs	214	15.56
Multivitamin	180	13.09
Analgesics and anti-inflammatory drugs	177	12.88
Cardiovascular system	105	7.64
Endocrine system	82	5.96
Drugs for skin	55	4
Drugs for CNS	49	3.56
Total	1375	100

by amoxicillin alone. Ciprofloxacin and ofloxacin were the most commonly prescribed quinolones. Among cephlosporines, cefixime, the third-generation cephalosporin either as single or combination therapy was very often used. Azithromycine was the most commonly prescribed macrolide as shown in Figures 2 and 3.
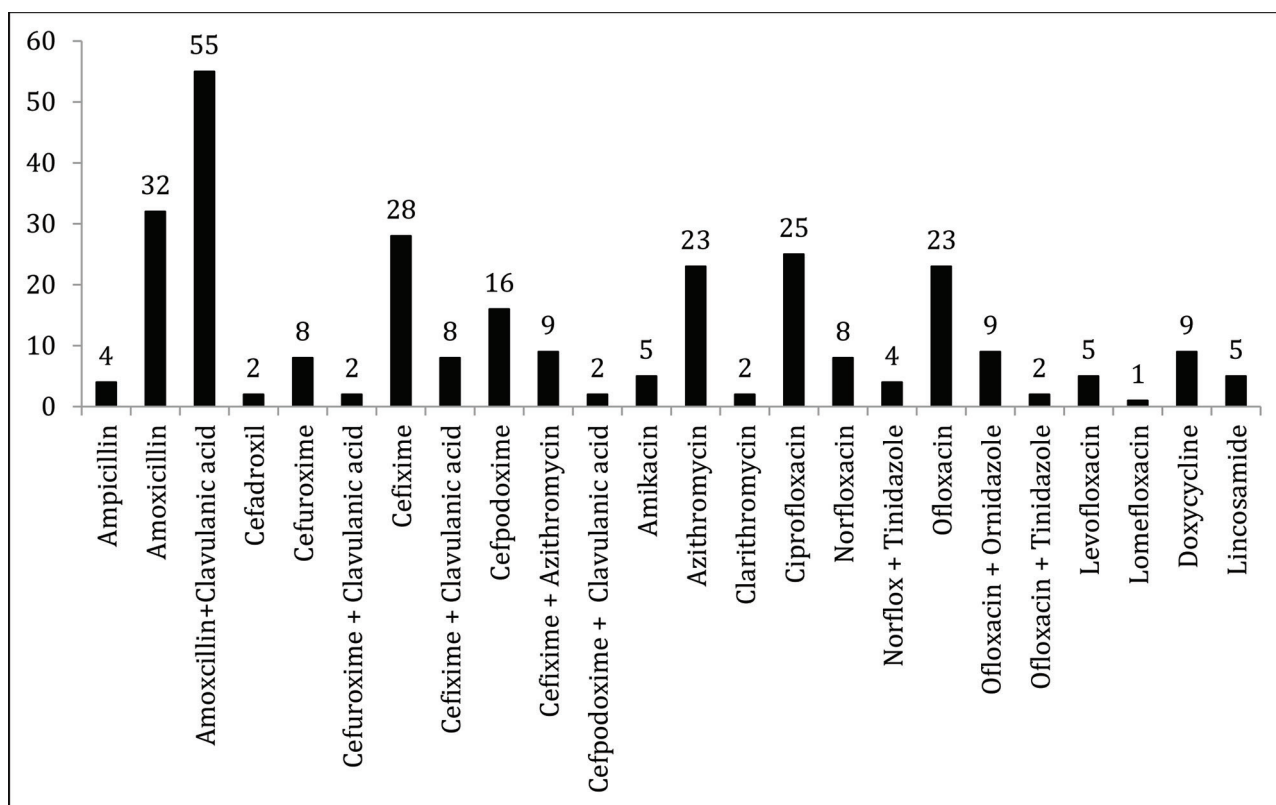
Fixed-Dose Combination

Of the 500 prescriptions, 61.8% were having fixed-dose combination where as no prescription was found with any banned drug. Majority of fixed-dose combinations were combination of expectorants and cough suppressants (22.65%) followed by combination of β-lactams with clavulanic acid (21.68%), proton pump inhibitors with domperidone (17.79%), and multivitamin preparations (12.29%) as shown in Table 3.

Discussion

Assessment of quality of medical care is carried out by medical audit.[6] Prescription audit is a part of medical audit
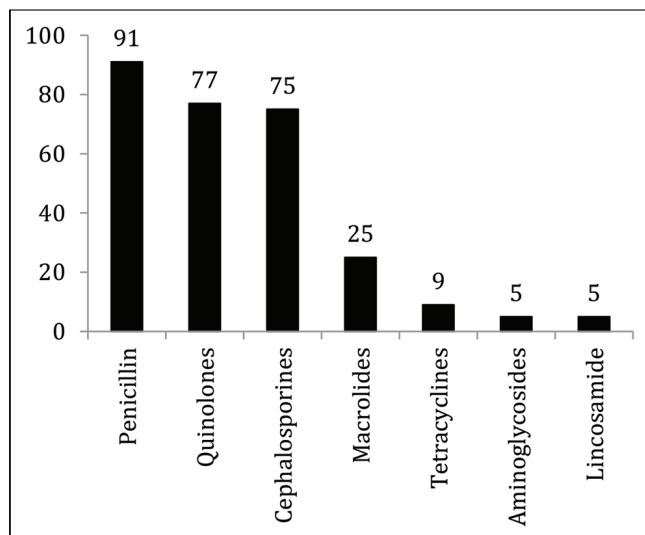
Figure 2: Pattern of antibiotics based on class.

Figure 3: Prescribing pattern of antibiotics based on name.

Table 3: List of drugs prescribed as fixed-dose combination

Fixed-dose combination	No. of time prescribed	%
Combination of expectorants, cough suppressants, anti-histaminics, broncodilators and mucolytics	70	22.65
Combination of proton pump inhibitors and domperidone	55	17.79
Multivitamin preparation	38	12.29
Combination of antipyretics, analgesics, muscle relaxants, and serratiopeptidase	34	11.00
Combination of amoxicillin, cefixime, cefuroxime, cefpodoxime with clavulanic acid	67	21.68
Combination of cefixime and azithromycin	09	2.91
Combination of norfloxacin and tinidazole	04	1.29
Combination of ofloxacin with ornidazole and tinidazole	11	3.55
Combination of calcium channel blockers with β-blockers	03	0.97
Combination of calcium channel blockers with AR blockers	01	0.32
Combination of metformin with glimipride and vildagliptin	16	5.17
Combination of diuretics and AR blockers	01	0.32

and is seen as one approach in improving the quality of patient care.[7] It is the critical assessment of medical and health-care system with a view to bring about necessary improvement in the same.

The general pattern of OPD attendance with respect to age is known to vary at different places and the pattern is affected by medical and non-medical reasons including age specific morbidity rates, accessibility of health services, health seeking behavior, health services utilization rates, socioeconomic status to name a few. The age group studied by us expectedly show some similarities and some dissimilarities. Some investigators studied similar age and gender groups as we did[8,9] whereas others differed.[10] Similarly, wide differences exist in samples studied as far as other sociodemographic variables such as literacy level of patients is concerned, with some investigators having studied predominantly literate subjects[11] whereas others studied predominantly illiterate populations.[12] When level of education is considered in this study, maximum were illiterate.

These sociodemographic determinants are significant from diverse viewpoints. These variables not only determine the morbidity profile in the study sample, but also the compliance to treatment and the ultimate pattern considering that nearly two-thirds of the expenditure is met out of pocket by the patients themselves. Therefore, this point is important to keep in mind while interpreting the data.

Therapeutic classification of drugs revealed variations as expected. Antibiotics followed by drugs for gastrointestinal system and vitamins and minerals are among the most frequently prescribed drugs reported by various investigators as is also reported in this study.[13–15] Particularly, worrying phenomenon relates to wide prescription of antibiotics for conditions where they are not indicated including cough and cold which mostly is viral in etiology. Same must be true of

unintended side effects of overprescribing practices, the extent of which often goes unnoticed and underreported.

Antimicrobials are widely prescribed agents in clinical practice which is quite evident in this study as well; the result of which showed 55% encounters with an antibiotic which is higher than specified by the WHO (<30%).[16] As is true for other prescribing practices, the reported antibiotic prescription rates show wide variation among investigators with few of them reporting higher[17] whereas many others reporting lower figures[10]; the correctness of which is difficult to establish as many factors are known to influence prescribing practices. Irrational use of antibiotics should be reduced as antimicrobial resistance is a global problem particularly in developing countries where the infectious disease burden is high and cost constrains the replacement of older antibiotics with newer more expensive one.[18] Emergence of MDR and XDR TB, methicillin-resistant strains, and resistance to antimalarial drugs are a grim reminder to inappropriate and irrational use of antibiotics.

Widespread preference for penicillin and its combinations observed by us and many other workers[19] can be attributed to morbidity pattern, practitioner's belief in its efficacy or low side effects profile, relative cost to the patients and selective marketing campaigns in favor of penicillin. Some of the predominance, however, could be explained by the fact that many investigators including us had significant proportion of patients having respiratory illnesses in our samples.[20] It might be an indication that respiratory diseases constitute a significant health problem due to prevalence of various risk factors such as cigarette smoking, weather conditions, dust allergy, and pollution. In this study a single antimicrobial was prescribed in 93.6% of all prescriptions whereas 2.9% prescriptions contained two antimicrobial agents compared to other investigators.[8,21] Number of antimicrobials and other

drugs should always be kept low to reduce the chances of drug interactions, adverse effects, cost of treatment, and drug resistance.

Strength

This study could serve as a framework upon which further studies in prescription audit can be launched to investigate the scope for improvement in prescribing pattern to ensure good quality of patient care. Educational intervention is needed to improve prescribing behavior of doctors such as short problem-based training course in pharmacotherapy and workshops focussed on rational use. Also adoption of International standard and locally comfortable guidelines on rational use of drugs can help to resolve such problems.

Limitation

As this being a descriptive study, identification of the factors related to the prescription was not carried out. Also the data included both the prescriptions of acute and chronic illnesses, distribution of them in the usage of drugs was not clearly identified. Moreover data were drawn only from three health-care facilities representing various types of facilities in primary health care. Difference observed in prescribing practices in this study should therefore not be generalized.

Conclusion

Many of the prescribing trends from this study are a cause of concern and need attention. The value of such audits in generating and testing hypothesis on inappropriate prescribing will definitely create an intervention to improve prescribing habits and ultimately patient care will be improved.

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