ANALYSIS OF OUTPATIENT PRESCRIPTION PATTERN
PRESCRIBED BY MBBS AND MD DOCTORS IN AHMEDABAD CITY

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ABSTRACT
The prescribing of medications is an essential part of the provision of health and represents a relatively safe and effective mode of treatment. The objective of this study is to analysis the prescription pattern across MBBS (Bachelor of Medicine and Bachelor of Surgery) and MD (Doctor of Medicine) doctors in an outpatient setting at Ahmedabad city. The study sample included 1300 valid outpatient prescriptions which met the inclusion criteria presenting 16 randomly selected community pharmacies across 4 zones in Ahmedabad city. The samples were collected for over a period of 2 months. The prescriptions was then compared and analysed for completeness and WHO (World Health Organisation) core indicators across MBBS and MD profiles. The 1300 prescriptions in the study were for a total 5515 of drugs (2755 drugs prescribed by 35 MBBS doctors whereas 2760 drugs prescribed by 48 MD doctors). Fixed dose combination was dominated among both prescribers, many of which were irrational. Prescribing drugs by generic name was 8.69% in case of MBBS and 10.29% in case of MD. Prescribing pattern also showed polypharmacy with average number of drugs per prescription 4.23 and 4.24 by MBBS and MD, respectively. Antibiotics were 1132 (402 by MBBS and 730 by MD) while injectable drugs were 4% by MBBS and 1.53% by MD. Our study highlighted the prescribing patterns among MBBS and MD doctors. Special attention needs to be given to MBBS, in terms of generic prescribing and prescribing drugs from Essential Medicine List.

KEYWORDS: Prescription pattern, MBBS, MD, Outpatient, WHO Essential Drug List, Ahmadabad.
INTRODUCTION

In 1985, World Health Organisation (WHO) defined that ‘Rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time and at the lowest cost to them and their community.’ Out of the total health budget, one-third of the countries spent 30-40% on drugs, many of which are prescribed irrationally. The GNP (gross national product) of these countries get almost doubled in every 16 years, however, their expenditure on drugs gets doubled in every 4 years.[1] Moreover, in India, the production of pharmaceutical and biotechnological formulations is clearly imbalanced and there is a ferocious competition among drug manufacturing companies in the market, which breeds malpractices.

Even though, there are merely 350 drugs listed in the WHO essential drug list, the Indian market is flooded with over 70,000 formulations, thus, this leads pharmaceutical companies to encourage MBBS and MD doctors to prescribe branded medicines in place of generic names, often in exchange for favors. This study was, therefore, undertaken with the aim to find out the prescription pattern.[2]

The irrational use of drugs has become a worldwide concern and to overcome this problem, the World Health Organisation (WHO) releases the WHO essential list of drugs periodically, for rational prescribing of medicines. This serves as a guideline for MBBS and MD doctors in India for rational prescribing.[3]

The appropriate use of drugs is ensured by drug use evaluation which is a system of ongoing, systematic, criteria-based drug evaluation. Drug use is complex topic involving three main individuals, that is, the physician, the patient and the dispenser. Each of these individuals is influenced by many factors that are often difficult to measure and quantify. Owing to the complexity of drug use, the World Health Organization (WHO) has developed a number of indicators, which standardize and evaluates the drug use. Furthermore, these indicators are divided in to three categories specifically: prescribing indicators, patient care indicators, and facility indicators.[4] Drugs are important components of health care system and play a crucial role in saving the life of an individual. The limited information on drug use throughout the world indicates that drugs are not optimally used. This inappropriate use of drugs has serious health and economic consequences for the success of national health care system as well as at individual level.[5]
As per WHO, India has a deficit of 6,00,000 doctors, out of which majorities are MBBS (Bachelor of Medicine and Bachelor of Surgery). MBBS and MD (Doctor of Medicine) are both medical degrees, approved by Medical Council of India, that are intended for professionals of the medical field and yet, in regards to many aspects they differ a lot from one another. In order for a student to be qualified as a practising physician or a doctor, he or she will need to complete the MBBS course which is considered as a basic undergraduate degree whereas, the MD course is more of a specialized Masters or a Postgraduate level degree that is obtained by students who wish to further specialize in the field of their choice. Indian healthcare market is dominated by MBBS and MD’s when compared to other systems of medicines in India. They have a very important role to play in Indian Healthcare System. Hence, considering the gift of trust which is received from the society, each and every physician should have some moral obligations in response to it. The physicians should prescribe drugs rationally to the patients in the manner which is intended to be. The MBBS degree usually takes the time of about four and half years to be achieved whereas, the MD course only takes two years to be completed. Also, MBBS is more of a widespread degree where every aspect and branch of medicine will be taught during its course time whereas, MD is more of a specialized degree, more subject oriented, where a student reading for one is required to the specialized degree in a specific branch of medicine of his or her choice. Another factor which differentiates the two is that the MD course is more concentrated upon practical training, they are mostly called as surgeons while MBBS course is more focused upon theory.[6] Considering the vital roles of prescribing practices by MBBS and MD doctors, the current study was, therefore, was conducted to serve as a guideline for rational prescribing and assessing the pattern of drug use by using WHO prescribing indicators across the Ahmedabad city.

MATERIALS AND METHOD
The study was a cross sectional survey of all prescriptions received at sixteen pharmacies, situated at four different zones of Ahmedabad city. The whole city was divided into four zones geographically into East, West, North and South zones and four community pharmacies at each zones ever selected randomly, who willingly wanted to participate in the study. The study sample included outpatient prescriptions presenting to the selected 16 community pharmacies in Ahmedabad which was collected for an over of two months. The prescribing doctors were unaware that the prescriptions were being audited. Before conducting the study, the chief pharmacist of each selected pharmacies was informed regarding the
nature of the study and its utility and his/her cooperation was sought out. A copy of the original prescription was used for analysis of drug use and WHO prescribing indicators. The prescription which contained all the basic minimum requirements about patients and prescribers were included in the study. Another inclusion criteria was, the prescriptions which were prescribed by only MBBS and MD were included whereas, prescriptions written on scraps of papers, not containing proper information about the prescriber or patients, prescriptions prescribed by other than MBBS and MD and all prescriptions which is meant for children below 12 years of age were excluded from the study.

All the prescriptions which met the inclusion criteria were collected and recorded for each drug dose, route, dosage form, frequency of administration, completeness of prescriptions, and duration of therapy. These recorded forms were used to evaluate the WHO specific drug use indicators for adoption in drug utilization studies.

The following basic drug use indicators were used in the study to describe the prescribing pattern.
A. Average number of drugs per prescriptions
B. Percentage of drugs prescribed by generic name
C. Percentage of prescriptions in which antibiotics were prescribed
D. Percentage of prescriptions in which an injection was prescribed
E. Percentage of drugs prescribed included in the essential medicines list (EML)
F. Percentage of Fixed Dose Combination prescribed

The WHO model list of essential medicines 2015 was used to classify the drugs as essential. Rational FDCs were considered according to draft guidelines for registration of FDC medicinal products.[7]

Statistical analysis of the data was done using Microsoft Excel 2013.

RESULT
The study sample consisted of 1300 valid prescriptions which met the inclusion criteria. Out of which 650 prescriptions were prescribed by MBBS whereas, the rest 650 prescriptions were prescribed by MD doctors. Government hospital prescriptions were not included in the study, this may be due to the fact that the prescriptions usually consists on a scrap of paper and did not have proper information, neither about the prescriber nor about the patient.
The 1300 valid prescriptions were for a total of 5515 of drugs (2755 drugs prescribed by 35 MBBS doctors whereas 2760 drugs prescribed by 48 MD doctors). The overall average number of drug per prescription was 4.24 and range being from 1 to 9, which indicated polypharmacy.

The percentage of fixed dose combination versus single agents were 35.39% and 28.15% in MBBS and MD respectively, which was quite high. Most of these combinations were irrational, especially those pertaining to vitamins and tonics.

Figure 1. Number of drugs prescribed per prescription.

Figure 2. WHO Prescribing Indicators for MBBS and MD.
Table No.1 Prescribing Indicator for MBBS and MD.

<table>
<thead>
<tr>
<th>WHO prescribing indicators</th>
<th>MBBS</th>
<th>MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of medicines per prescription</td>
<td>4.23</td>
<td>4.24</td>
</tr>
<tr>
<td>Percentage of prescriptions using generic names</td>
<td>13.03</td>
<td>17.82</td>
</tr>
<tr>
<td>Percentage of prescriptions with antibiotics</td>
<td>26.61</td>
<td>39.23</td>
</tr>
<tr>
<td>Percentage of prescriptions with injections</td>
<td>4.00</td>
<td>1.53</td>
</tr>
<tr>
<td>Percentage of prescriptions containing medicines from EML</td>
<td>43.99</td>
<td>68.47</td>
</tr>
<tr>
<td>Percentage of FDC prescribed</td>
<td>35.93</td>
<td>28.51</td>
</tr>
</tbody>
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DISCUSSION

The degree of polypharmacy can be measured by a core prescribing indicators which was developed by World Health Organization. These prescribing indicators are also used to measure the tendency of the prescribers to prescribe drugs by generic name and the overall
degree of use of antibiotics and injections. The essential drug list which was aimed to measure the degree to which the prescribing practice obeyed to the essential drug list, the national or hospital formulary or standard medication/therapy guideline were also measured by searching for the appropriate drug name and number of drugs prescribed from essential drug list available.[8]

The findings of our study highlight the on-going irrational drug prescribing in Ahmedabad city. The ultimate burden of this irrational drug cost falls entirely on patients. Our study showed, that, 623 fixed dose combinations out of 990 drugs were irrationally prescribed by MBBS doctors whereas, 125 fixed dose combinations out of 787 were irrationally prescribed by MD doctors.

In another study which was conducted in Mumbai, reported slightly lesser figure of 2.9 number of drugs per prescription in the study.[9] There is a lack of published articles on prescribing practices among the MBBS practitioners and MD practitioners. However, it is desirable to keep the number of drugs per prescription as low as possible as since higher figures may lead to increased risk of drug interactions[10], increased hospital cost[11], and errors of prescribing.[12]

In a similar study in Nigeria, the drugs per prescription were 3.1.[13] The antibiotic study in this study has been higher than the figure of 39.6% per prescription reported by Karande et al.[9] The injections use was also high than that noted in the study by Karande et al. in Mumbai. However, our study showed the percentage of prescriptions containing from Essential Medicine List was 43.99% by MBBS doctors and 68.47% by MD doctors.

The use of injection for treatment is accompanied with a variety of disadvantages including sepsis at administration, increased risk of tissue toxicity from local irritation, costly, difficulties in correcting the error, thus, WHO recommended that less than 10% prescription should include one or more injections.[14] All health facilities were using injection in a comparable fashion with WHO recommendation which is encouragable. However, other studies, Tanzania 19%[14], in Yemen 46.0%[15] and Western China 22.93%[16], report higher figures.

The percentage of fixed dose combination versus single agents were 35.39% and 28.15% in MBBS and MD respectively, which was quite extreme and non satisfactory. As most of the
fixed dose combinations were irrational drugs. MBBS doctors showed a higher percentage of irrational prescribing when compared with MD doctors. Although irrational prescribing is one habit which is difficult to cure, there is some evidence that interventions such as short problem-based courses in pharmacotherapy\textsuperscript{[17]} and rational use-focused workshops\textsuperscript{[18]} can show an improved prescription behaviour and skills. There is also an urgent need to implement training initiatives, with support from the public to improve the pattern of prescribing in India and ensure patients receive rational drugs, evidence-based, economical and for right indications.

**CONCLUSION**

Our study reveals, that, the pattern of prescription in terms of completeness and rationality remains poor regardless of all the efforts taken by the government and the WHO. Prescribing of irrational drugs was seen in both MBBS as well as MD doctors. There is an urgent need to develop standards of drug prescription and develop ways and means to ensure that they are adhered to. Furthermore, special attention needs to be given to MBBS doctors where generic names were not prescribed and drugs prescribed from Essential medicine list were also below average. In terms of polypharmacy, both MBBS and MD doctors were not optimal. Additional research should be done to evaluate the prescribing pattern of MBBS as well as MD doctors.

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**CONFLICT OF INTEREST**

"There is no conflict of interest". In case, no information was provided by authors whatsoever then by signing the Copyright Transfer Agreement, authors agree that publisher is allowed to include "The authors declared no conflict of interest".

**ABBREVIATIONS**

MBBS: Bachelor of Medicine and Bachelor of Surgery  
MD: Doctor of Medicine
WHO: World Health Organization  
FDC: Fixed Drug Combination  
EML: Essential Medicine List  
GNP: Gross National Product  

REFERENCE  


