OUT-PATIENT PRESCRIBING PRACTICES AT MBAGATHI DISTRICT HOSPITAL-NAIROBI COUNTY
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ABSTRACT

Objective: **To assess medicine use practices by using WHO prescribing and patient care indicators in Mbagathi Hospital outpatient department.**
Design: **A hospital based retrospective study.**
Setting: **Mbagathi District Hospital outpatient department between 1ˢᵗ January to 30ᵗʰ June 2012.**
Main outcome measures: **Measures used in this study included, total number of medicines in a prescription, proportion of medicines in the essential drug list, proportion in generic names, proportion with injectables and antibiotics and percentage actually dispensed.**
Results: **Total number of drugs prescribed was 1,506. On average, each patient was prescribed 3.85 types of drugs. A total of 835 drugs were prescribed by generic name, accounting for 25.6% of total number of drugs prescribed (1,506). Out of 391 sampled prescriptions, 266 had antibiotics accounting for (68.0%). A relatively small proportion of the prescriptions, 9.5% had an injection. A total of 1,087 drugs were prescribed according to the essential drugs list or formulary, accounting for 72.2% of total number of drugs prescribed (1,506). Only 55.2% of total medicines prescribed were actually dispensed and the rest were out of stock.**
Conclusion: **The prescribing practices in this study are not satisfactory, as suggested by polypharmacy, over prescription of antibiotics, prescribing by brand names and lack of awareness of essential drugs list.**

INTRODUCTION

Irrational and inappropriate use of drugs is a major concern in both developed and developing countries. Its consequences include ineffective treatment, development of resistance to antibiotics, adverse effects and economic burden on the patients and the society at large. The cost of such irrational drug use is enormous in terms of both scarce resources and the adverse clinical consequences of therapies that may have real risks but no objective benefits (1).

Availability of medicines is important as far as the reduction of mortality and morbidity associated with disease burden are concerned. However, lack of essential medicines is still one of the most serious public health problems. About 30 % of the world's population lacks the medicines they need. The situation is worse in the poorest parts of Africa and Asia where the figure rises to over 50% (2).

The emerging problem of antimicrobial resistance deserves more attention. The use of antimicrobial medicines has greatly contributed to the decline in morbidity and mortality caused by infectious diseases, but these advances in treatment are being undermined by the rapidly increasing problems of anti microbial resistance. Common infectious diseases, such as tuberculosis (TB), sexually transmitted infections, acute respiratory infections, malaria, dysentery, and HIV/AIDS are becoming increasingly difficult and expensive to treat, and the burden is greatest in developing countries where resources are limited and infection rates are high. With antimicrobial options becoming limited, physicians in developing countries may have to use older antimicrobials that have become increasingly ineffective (3).

The 1985 World Health Organization (WHO) conference on rational medicine use marked the beginning of efforts to improve the use of medicines, especially in developing countries (4). In 1993, the WHO Action Programme on Essential Drugs (WHO/DAP) published the gate Drug Use in Health Facilities in response to the increased awareness of the problems impeding the rational use of medicines (5). This manual presented 17 indicators for assessing medicine use in outpatient health facilities and has been instrumental in standardising medicine use studies.

Despite the grave consequences about the irrational use of medicines and medicine stock outs in public facilities, there is limited data available about the appropriate or inappropriate prescription practices such as polypharmacy and over usage of antibiotics and injections in government hospitals in Kenya. The objective of this study therefore was to assess medicine prescribing practices at Mbagathi hospital outpatient department.

MATERIALS AND METHODS

The study was conducted in Mbagathi District Hospital (MDH) situated in Dagoretti Sub-county of Nairobi County. The hospital serves diverse population, both within and outside Nairobi, with a bulk of mostly the urban poor. The government through Kenya Medical Supplies Agency (KEMSA) provides essential medicines and equipment to the hospital. On average about 700 patients daily are attended to at the busy outpatient department. Mbagathi Hospital has been recognised as a centre of excellence in HIV management.

A hospital based retrospective study was conducted involving the review of outpatient prescriptions between January 1st to June 30th 2012. A minimum of 6000 prescriptions are generated every month in Mbagathi Hospital. From this a minimum of 384 prescriptions for the six months was randomly picked. (384/6)=64 at least 64 prescriptions was picked randomly each month. A sampling interval of (6000/384) 16 was used, until a minimum sample of 384 was achieved. Sample size was determined using the fisher's formula for estimating the minimum sample size (6).

Permission to use patient's records was sought from the hospital administration and ethics approval was sought from KEMRI ERC committee, SSC NO 2524 .Systematic sampling to avoid bias was used. The prescriptions already available were reviewed. All prescriptions handled at the outpatient department were eligible for the study but those from outside the hospital and refill were not.

Data was collected using a schedule to gather information with the following parameters (5)

- Average number of medicines per encounter.
- Proportion of medicines prescribed in generic name.
- Proportion of prescriptions with antibiotics.
- Proportion of prescriptions with injections.
- Proportion of medicines prescribed from Essential Drug List (EDL).
- Proportion of drugs actually dispensed.

Data collected were entered onto the computer in a Microsoft excel spreadsheet. Patients' records were handled confidentially. Information about the identity of the prescriptions was delinked by assigning codes to the prescriptions. Data were analysed using SPSS.
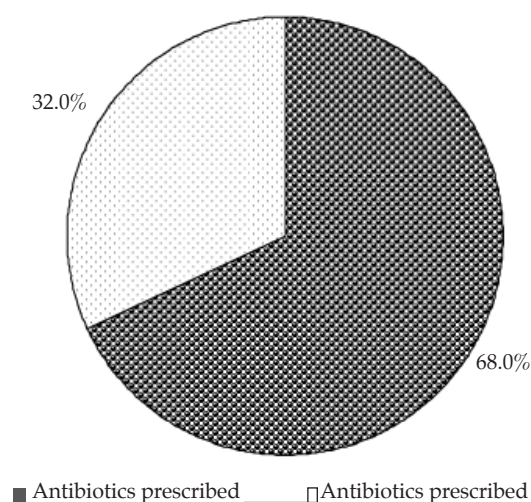
RESULTS

A total of 391 prescriptions were randomly selected. Data were collected using a schedule indicating the different prescribing and patient care indicators as presented in Table 1. The total number of drugs prescribed was 1,506 with an average of 3.85 drugs prescribed per patient. On average, each patient was prescribed two drugs in their generic name (+ 1 SD) and an average of three (+ 1 SD) drugs from the Essential medicine list.

Table 1

Distribution of selected prescribing variables among the sampled records

Prescribing variable n = 391	Mean	Minimum	Maximum
Total number of medicines prescribed	3.85	1	8
Number of medicines in generic name	2.0	0	7
Number of medicines from EML	3.0	0	8
Number of medicines actually dispensed	2.0	0	8
Number of antibiotics	1.0	0	4
Number of injections	0.1	0	2

Average number of drugs actually dispensed was 2 (+ 1 SD) and each patient was prescribed for at least one antibiotic. Few prescriptions, only 37 had an injection prescribed. Average number of injections prescribed was 0.1 (+ 0.3 SD). A relatively high proportion of the prescriptions, 62.7% had a total of three to four drugs with 26.3% having five or more drugs (Figure 1).

Figure 1
Distribution of total number of drugs prescribed

32.0%

68.0%

■ Antibiotics prescribed ▢ Antibiotics prescribed

Majority of the prescriptions, 87.2%, had at least one drug with a generic name, with most of the prescriptions, 51.7%, having one to two drugs. Fifty prescriptions, 12.8%, had none of the drugs bearing a generic name. A greater majority of the prescriptions, 95.9%, had at least one drug listed in the essential medicine list (EML), with 49.1% having three to four drugs in EML. Sixteen prescriptions making 4.1% had none of the drugs listed in EML. A proportion of 56.5% prescriptions had one to two drugs as the actual number dispensed. Thirty five prescriptions, 9.0%, had no drugs dispensed (Table 2).

Table 2
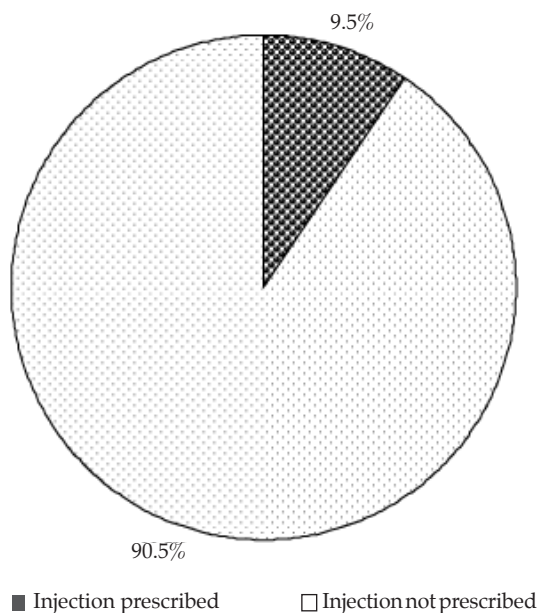*Selected prescribing variables among the sampled records*

Variable	n = 391	%
Total number of drugs prescribed		
1 - 2 Drugs	43	11.0
3 - 4 Drugs	245	62.7
5 or more drugs	103	26.3
Number of drugs in generic name		
Nil	50	12.8
1 - 2 Drugs	202	51.7
3 - 4 Drugs	108	27.6
5 or more drugs	31	7.9
Number of drugs from EML		
Nil	16	4.1
1 - 2 Drugs	149	38.1
3 - 4 Drugs	192	49.1
5 or more drugs	34	8.7
Number of drugs actually dispensed		
Nil	35	9.0
1 - 2 Drugs	221	56.5
3 - 4 Drugs	119	30.4
5 or more drugs	16	4.1

Number of antibiotics		
Nil	125	32.0
1 - 2 Drugs	256	65.5
3 - 4 Drugs	10	2.6
Use of antibiotics		
Yes	266	68.0
No	125	32.0
Use of injections		
Yes	37	9.5
No	354	90.5

Prescriptions having at least one drug being an antibiotic constituted 68.1%, with 65.5% having one to two antibiotics. One hundred and twenty five prescriptions, 32.0%, had no antibiotic prescribed (Figure 2). A relatively small proportion of the prescriptions 9.5% had an injection (Figure 3).

Figure 2
Use of antibiotics

Figure 3
Use of injection

9.5%

90.5%

■ Injection prescribed   □ Injection not prescribed

Analysis of percentage constitution of selected prescribing variables with respect to total number of drugs prescribed among the sampled records was done as presented in (Table 3).

Table 3

Percentage constitution of selected prescribing variables with respect to total number of drugs prescribed among the sampled records

Variables	n=391	%
% Constitution of drugs with generic name with respect to total number of drugs prescribed		
Nil	50	12.8
(1 - 25)%	32	8.2
(26 - 50)%	131	33.5
(51 - 75)%	89	22.8
(76 - 99)%	18	4.6
100%	71	18.2
% Compliance to EML in drugs prescription with respect to total number of drugs prescribed		
Nil	16	4.1
(1 - 25)%	10	2.6
(26 - 50)%	84	21.5
(51 - 75)%	104	26.6
(76 - 99)%	25	6.4
100%	152	38.9
% Constitution of drugs actually dispensed with respect to total number of drugs prescribed		
Nil	35	9.0
(1 - 25)%	43	11.0
(26 - 50)%	131	33.5
(51 - 75)%	88	22.5
(76 - 99)%	17	4.3
100%	77	19.7

Out of all the prescriptions, 18.2% had all the drugs prescribed bearing a generic name while 33.5% had 26 – 50% of the drugs bearing a generic name. Fifty prescriptions, 12.8%, had none of the drugs bearing a generic name (Figure 4). Prescriptions that had all the drugs prescribed listed in EML constituted 38.9% while 26.6% had 51 – 75% of the drugs listed in EML. Sixteen prescriptions, 4.1%, had none of the drugs listed in EML (Figure 5).

Table 4
Estimation of different prescribing indicators

Indicator	Estimate
Prescribing indicators	
Average number of drugs per encounter (1,506/391)	3.85
Percentage of drugs prescribed by generic name (835/1,506)	25.6%
Percentage of encounters with an antibiotic prescribed (266/391)	68.0%
Percentage of encounters with an injection prescribed (37/391)	9.5%
Percentage of drugs prescribed from essential drugs list or formulary (1,087/1,506)	72.2%
Patient care indicators	
Percentage of drugs actually dispensed (832/1506)	55.2%

Figure 4
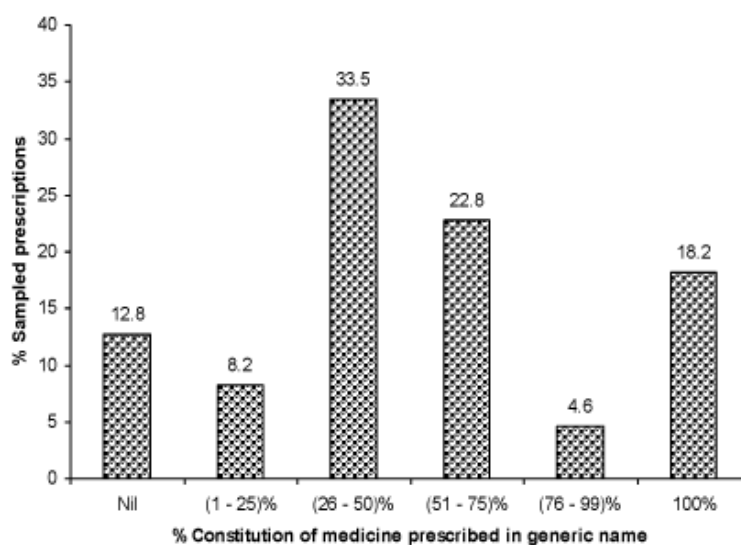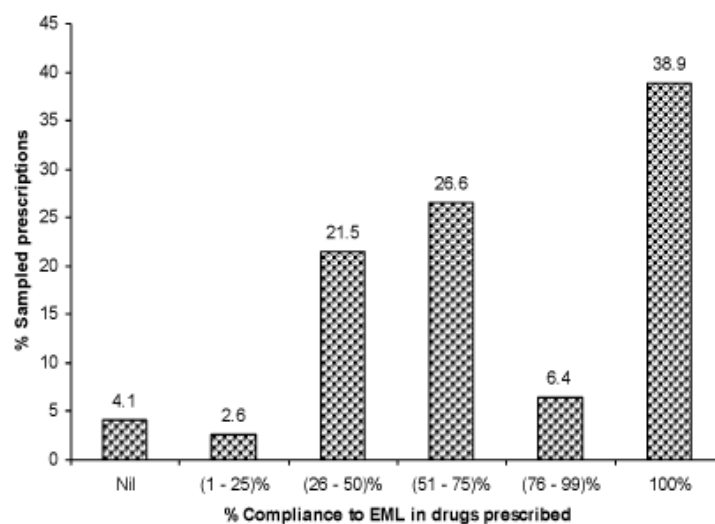*Percentage constitution of generic drugs*

Figure 5
Percentage compliance to EML in prescriptions

A relatively low proportion of the prescriptions, 19.7%, were dispensed as prescribed while 33.5% constituted 26–50% of the drugs dispensed as prescribed. Thirty five prescriptions constituting 9.0% had no drugs dispensed at all.

DISCUSSION

Prescribing practices influence the patient's compliance and thereby therapeutic success or failure. The different prescribing parameters analysed in this study provided an insight into the prescribing behaviour of the clinicians in Mbagathi District Hospital.

Recently, there has been a rigorous effort to ensure Rational Use of Drugs for which WHO has identified specific drug use indicators that include number of drugs, use of generic names in prescribed drugs and adherence to Essential Drug List (5).

With regard to the average number of drugs per prescription, the value found in the present study was 3.85. A study conducted in Jordan gave 2.3 (7)Brazil 2.4 (8) and India 2.7 (9) In similar studies conducted, the highest and lowest values found were 3.8 in Nigeria and 1.3 in Ecuador (10) respectively.

The variation in results may be due to difference in characteristics of health care delivery system, socio-economic profile, and morbidity and mortality characteristics in the population. Since, WHO has recommended that average number of drug per prescription should be 2.0 (11), the results of our study reflects polypharmacy which may lead to adverse drug reactions, decrease adherence to drug regimens and unnecessary drug expenses. It was observed the prescriptions with many medicines up to eight were from the medical department. For chronic clinical conditions like hypertension, and diabetes, the patients can require more drugs than as stated by WHO. In such cases polypharmacy can be acceptable (12).

The percentage of drugs prescribed by generic name was 25.6% in our study which is less than that reported in studies conducted in Cambodia 99.8%, (13) India 73.4%, (14) and Brazil 30.6% (15). In Nepal the results obtained were 63.5% (16). The use of generic names is recommended by WHO and regarded as an important factor for promoting Rational Use of Drugs and contributes to cost reduction and provides more alternatives for drug purchases (8).

In the present study the encounters with antibiotic prescription was 68.1%. The antibiotic prescription reported in Iran was 61.9% (17), England 60.7% and Norway 48% (11).

According to WHO, 15-25% of antibiotics encountered is expected in the countries where an infectious disease is more prevalent. This finding suggests that antibiotic prescribing needs to be regulated. The high percentage of antibiotics prescribed in our study setting may be due to cultural beliefs about antibiotics, patient expectation to receive antibiotics, or prescribers' belief that the therapeutic efficacy of antibiotics is low. In addition, empirical treatment is also a problem, where two or more drugs are prescribed but one specific antibiotic is enough after proper diagnosis.

The prescribers need to be extra cautious before prescribing any antibiotic to avoid unnecessary burden on patient and development of resistance.

The percentage of drugs prescribed from the essential drug list for Mbagathi District Hospital in the study period, was 72.2%, which is still far from the standard 100% derived to serve as ideal.

In our study, the percentage of prescription with an injection encountered was 9.5%. Minimum use of injections is preferred and this reduces the risk of infection through parenteral route and cost incurred in therapy. On this indicator the hospital is doing very well since the aim is to minimise injection use as much as possible. A national baseline study on drug use indicators in Ethiopia in September 2002 found the percentage of encounters with an injection to be 23%. Injections are very expensive compared to other dosage forms and require trained personnel for administration. Moreover, unhygienic use of injections can increase the risk of transmission of potentially serious pathogens, such as hepatitis, HIV / AIDS, and blood-borne diseases.

Essential medicines were available in only 55.2% of the cases .This is quite low and something needs to be done on availability of essential medicines in the hospital. An ongoing crisis of essential medicines is a big killer in Kenya. There are not enough medicines in government hospitals. Medicines are often the largest health-related expense for poor families. This expense is made worse with medicines being out-of-stock in government hospitals, because families must turn to the private sector where prices are significantly higher. This burden becomes even more difficult to manage in times of increased prices for food and other commodities.

In conclusion, the prescribing practices in this study are not satisfactory, as suggested by polypharmacy, over prescription of antibiotics, prescribing by brand names and lack of awareness of essential drugs list. However, injection prescribing was acceptable. The efforts of the prescriber can be successful and patient satisfaction can be achieved only if the patient receives rational treatment for his disease or illness.

Any policy alone will not be effective in ensuring rational prescribing, and therefore the solution is a combination of education and supervision of staff who prescribe the medicines, education of patients, and adequate supply of needed drugs (18) Several strategies have been suggested in WHO policy perspective for Rational Use of Medicines (2)

Sensitisation targeting both medical practitioners and patients should be done to encourage rational drug prescription and use respectively. This will maximize on the provided resources even though limited (19) Setting up a drugs and therapeutic committee in the hospital and giving it the authority to improve the use of medicines is very important. The committee will select on the basis of treatment of choice lists of essential medicines that are used in drug procurement and insurance re imbursement by formulating a hospital formulary and prescribers should be encouraged to prescribe from the same. This will help to curtail unnecessary expenditure on costly drugs. Medical community should prescribe with social perspective in mind and should stay away from practices which will be detrimental to the society at large. Promoting systems of supervision, audit and feedback in the hospital is also encouraged. Special committee at the hospital level or programme dedicated to addressing drug shortages at national or county level should be established.

There is a need to allocate more funds to the health sector especially to cater for medicines. Facility Improvement Funds to be used to supplement treasury allocations in medicine procurement. The hospital, with the help of donor agencies can get additional funds to purchase medicines and medical supplies. It is necessary to acknowledge the July 2004 launch of the National Social Health Insurance Fund whose monies could be used to improve access.

Drawing up and enforcing criteria for ethical drug promotion in the hospital is critical. This will ensure new medication is prescribed only when it is necessary.

Prescribers should review previous prescriptions through electronic medical record or interview with the patient before writing a new prescription. Laboratory identification and sensitivity tests to target specific bacteria with the antibiotics that have been identified as effective should be conducted. Alternatives to antibiotics such as topical debridement and application of topical antiseptics should be sought also.

When applied strategically, health informatics can inform a variety of policy questions that go beyond medicine use including: medicine management and pharmacovigilance hence patient safety, nonadherence to guidelines, untimely medicine use, antibiotic misuse/overuse, medication errors, mismanaged polypharmacy, and suboptimal generic use.

At national or policy level, the ministry of health needs to establish a mandated multidisplinary body to coordinate policies on medicine use and monitor their impact in appropriate and enforced drug regulation. Formulate and use evidence based clinical guidelines in training, supervision and supporting critical decision making about medicines. Promote problem based training in pharmacotherapy in undergraduate curricula. The curriculum of doctors, pharmacists, clinical officers and nurses should include the rational use of drugs to inculcate for correct prescribing habits. Make continuing in service medical education a requirement for licensure in all medical professionals that have not implemented that like the clinical officers who form the bulk of prescribers.

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