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Research Article

Changing physician behavior: interventions to improve prescription writing practices in a secondary level hospital in Delhi

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ABSTRACT

Background: According to a report by World Health Organization (WHO) in 2003, approximately 50% of all patients fail to take their medicine correctly. This is due to errors in prescription, underuse or misuse of medicines and ignorance of prescribers, dispensers, and patients.
Methods: It is a hospital-based interventional-study carried out in a secondary level multispecialty hospital of Delhi. Investigators collected 536 prescriptions from the outpatient department of various departments and studied according to WHO core prescribing indicators for assessing drug prescription writing pattern. Interventions to improve the prescribing pattern included one continued medical education session and one workshop on prescription writing (providing essential drug list [EDL] etc.,), sharing the baseline data with the physicians and administrative approach. Evaluation of the prescribing pattern after 6 weeks of the intervention was done to find out the impact.
Results: On an average 3.43 drug per encounter before intervention increased to 3.46 drugs per encounter. Inclusion of generic drugs and from EDL increased significantly from 54.8% to 73.4% and 76.9% to 88.4% respectively.. Prescribing antibiotics and injectables showed no significant reduction from baseline. The completeness of the prescriptions with respect to the various components improved significantly.
Conclusion: Combining different intervention seems a noble approach to improve the prescription writing practices with respect to completeness and inclusion of generic drugs, drugs from EDL.

Keywords: Antibiotics, Completeness of prescription, Core prescribing indicators, Essential drugs, Generic drugs, Rational drug use

INTRODUCTION

Drugs are an important aspect of health care delivery system; it not only brings the patient's confidence but also credibility to the health facility. It has mainly two components one is its availability and other is its dispensing. Dispensing starts with a prescription which represents a transaction between patient and the physician. Prescription writing is a science and an art. A correct prescription can avoid side effects, wastage, and mismanagement of disease concerned and will add quality to the patient care. In the current scenario, more emphasis is given on drug production and its availability with correct dispensing getting major setback due to poly-pharmacy, physician's prescribing behavior, promotion of branded drugs, irrational drug combinations etc.[1,2] This is commonly seen in all levels of health care.

At present, nearly two billion people lack regular access to essential medicines and in developing countries like India this situation is worse.[3,4] Irrational prescribing of drugs has further aggravated the situation.[5] Even after correct prescription compliance of the patients has been poor.[6] To address these issues, use of essential drugs, prescribed by their generic names, has been emphasized by the Government of India in its Drug Policy and also by World Health Organization (WHO).[7,8] Rational drug use which refers to the prescription of the right drug for the right indication in the right dosage and dosing frequency for the correct duration (WHO, 1985, 2002)[9] is now promoted. In Indian scenario, a proper reporting of medication errors in the hospital is not available, routine auditing of prescriptions has not yet started, and many prescription errors go unnoticed with severe side effects. Many of the problems cited above can be reduced through a correct prescription. An individualized or a group behavior change approach is a

basic requirement among physicians, to improve the quality of prescription writing. Different approaches such as educational approach, managerial approach, and economical approach were tried to change the behavior of a physician with varied results.[10-12] Keeping in view on these issues, this study was carried out with the objectives of describing physician's perception of writing prescriptions and to find out the effect of targeted multipronged interventions on completeness of prescription and their writing practices of prescription using WHO core prescribing indicators.

METHODS

Current study is a hospital-based interventional-study carried out in Maharishi Valmiki Hospital (MVH) situated in the outskirt of North West district of Delhi during February to August 2013. MVH is a 150 bedded-multispecialty hospital with outpatient department (OPD) attendance of approximately 1000 patients per day.

Keeping in view of the study period which was approximately six months and accommodating the time gap of 6 weeks after the intervention, it was decided to take 250 prescriptions each for before and after intervention. Both quantitative and qualitative techniques were used to collect data. As there were 55 physicians providing OPD services, we decided to collect a maximum of five prescriptions from each physician attending the OPD outside their respective rooms on various days in a week. Prescriptions were collected from the patients and the same were photocopied to be analyzed later. Prescription writing practices were assessed as per WHO prescribing indicators[9] which included average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounter with an antibiotic prescribed, percentage of encounter with an injection prescribed, and percentage of drug prescribed from the essential drug list (EDL). Completeness of prescription was evaluated by indicators like presence of chief complaints, brief medical history, examination findings, drugs and direction of their use, follow up and signature with name. Superscription of prescription which includes the date, patient name, age, sex and address, was excluded as the facility had a computer generated registration system in place. A stop watch was used for noting down the average consultation time.

To assess the physician's perception a semi-structured questionnaire was used, and it was pretested in a different hospital (a multispecialty hospital) setting and necessary modifications were made before administering it in the current study. It contained questions pertaining to writing different component of prescription like chief complaints, examination findings, history of the present/past illness, provisional diagnosis, advice, follow ups, etc., and reasons for their current writing practices of prescriptions. All these assessments were done by three investigators separately.

After baseline data collection, one continued medical education (CME), and one workshop on prescription writing

was conducted. The participants included all the 55 doctors who were attending the OPD irrespective of their designations and departments. Among the participants, majority (41) were senior doctors with experience of more than 5 years and 14 resident doctors with experience of 3 years or less. The result of the preliminary study was shared among the participants with emphasis on ethical and legal implications of correct prescribing. The components of an ideal prescription were discussed in the CME. The need for availability of the EDL was expressed by the participants of the workshop. Following this, an order was issued by Medical Superintendent of the hospital regarding writing of generic names of drugs from the provided EDL, which became a part of the intervention. Ideal prescriptions in the form of pamphlets were distributed among the doctors. Prescriptions from those doctors were collected and studied to evaluate the change in their prescribing pattern after 6 weeks of the intervention.

Ethical issues were discussed and written permission was taken from the medical superintendent of the hospital. All the study participants were included in the study after taking a verbal informed consent. Information collected from physicians through questionnaire, and their identification data remained completely anonymous.

The data were entered in Microsoft Excel 2007 and analyzed using SPSS version 18 (PASW statistics for Windows, Chicago: SPSS Inc.). The categorical values were expressed in terms of proportions and quantitative variables as median (Q1Q3) and mean. Chi-square test was used to see the statistical significance between two proportion and Wilcoxon signed rank test was used for nonparametric paired variables. $p<0.05$ was taken as the level of significance. The qualitative data were analyzed manually by adopting free listing of responses, domain identification, and coding of responses.

RESULTS

In total, 536 prescriptions were collected out of which 500 were analyzed in the study after excluding 36 prescriptions due to illegibility. All of the 55 doctors attending the daily OPD were interviewed for their own opinion on prescription writing.

Table 1 shows the comparison between WHO core prescribing indicators before and after intervention. In total, 858 drugs (3.43 drugs per encounter) before intervention and 867 drugs (3.46 drugs per encounter) after intervention were prescribed without having statistical difference. Inclusion of generic drugs in the prescription increased significantly from 54.8% pre-intervention to 73.4% post intervention ($p<0.001$). Similarly, drugs written from the EDL increased significantly from 76.9% to 88.4% after intervention ($p=0.008$). Of the total number of drugs, 19.93% (171/858) comprised of antibiotics which decreased to 18.2% (158/867) post-intervention. Encounter wise, antibiotics were prescribed in 46.8% (117/250 patients) of encounters out of which 21.6% (54/117 patients) were prescribed more than one antibiotic before intervention. Prescribed antibiotic

Table 1: WHO core indicators assessing drug prescribing pattern before and after intervention.

WHO core indicators	Pre-intervention		Post-intervention		p value*
	Prescriptions (N=250) Median (Q1-Q3)	Total drugs (N=858) N (%)	Prescriptions (N=250) Median (Q1-Q3)	Total drugs (N=867) n (%)	
Total number of drugs	3 (2-4)	858 (100)	4 (3-5)	867 (100)	0.603
Generic drugs	2 (1-3)	471 (54.89)	3 (2-3)	636 (73.4)	<0.001
Antibiotics	1 (0-1)	171 (19.93)	1 (0-1)	158 (18.2)	0.399
Injections	0 (0)	14 (01.60)	0 (0)	21 (2.4)	0.437
EDL	3 (2-3.25)	660 (76.92)	3 (3-4)	766 (88.4)	0.008

*Wilcoxon signed rank, EDL: Essential drug list

percentage decreased to 40.4% (101/250 patients) and 19.8% (20/101 patients) were prescribed more than one antibiotic after intervention. With reference to injectable drugs, 5.6% (14 patients) of encounters were prescribed injections with no significant change post-intervention.

Table 2 shows the effect of the intervention on the prescription writing practices. The practice of writing complaints improved from 65.2% to 82.4% (p<0.001). Noting down the history increased significantly (p<0.001) from 24% to 50%. Examination findings were found noted in 50.4% of prescription as compared to 32% prior to the intervention (p<0.001). Improvement (from 19.6% to 32%) in mentioning the provisional diagnosis of the patient was significant (p<0.001). However, the practice of writing advice (from 44.2% to 51.2%) and signature with the name (from 23.2% to 27.6%) improved marginally with no statistically significant difference.

Reasons given by the doctors for writing incomplete prescriptions included: "lack of time," "lack of the standard protocol of treatment," "don't know the diagnosis most of the times." They further suggested that stamps mentioning their names and designations should be made available to overcome time constraint which would further improve the accountability. On being probed about the reason for writing brand names, the physicians mentioned, "brand names are easier to remember", "non-availability of drugs at the hospital pharmacy", "preference of writing combinations available in the market to improve the compliance", "frequent visit with incentives from pharmacological companies", "habitual inclination", "want their patients to be cured i.e., lack of faith on quality of drugs provided by hospital", "it's the duty of the administration". The average consultation time was 1.59 mins/patient.

DISCUSSION

Our study showed a major lack of completeness with respect to prescription writing before the intervention. This may be due to patient burden or lack of time which gave them less time for writing the prescription which were elicited by the physicians and was supported by average consultation time. Reasons like nonavailability of drugs at the hospital pharmacy, preference of writing combinations available in the market to improve the

Table 2: Effect of intervention on completeness of prescription writing pattern.

Components of prescription	Presence of the components as per prescriptions (N=250)		p value
	Pre-intervention n (%)	Post-intervention n (%)	
Complaints	163 (65.2)	206 (82.4)	<0.001
History	60 (24.0)	125 (50)	<0.001
Examination	80 (32.0)	126 (50.4)	<0.001
Provisional diagnosis	49 (19.6)	80 (32)	<0.001
Advice/ follow-up	110 (44.2)	128 (51.2)	0.145
Signature with name	58 (23.2)	69 (27.6)	0.294

compliance and habitual inclination for writing drugs with brand name were some of the new findings in our study. Frequent visit of representatives from pharmacological companies and lack of faith on quality generic drugs as stated by physician was similar to study conducted by Banerjee and Bhadury,[13] Omojasola et al.,[14] Theodorou et al.[15] and Shrank et al.[16]

Our findings showed that average number of drug prescribed per encounter was 3.43 which was higher than the recommended number by WHO of 1.6-1.8.[17] This finding was also higher than that quoted by different studies conducted in India and other parts of the world which ranged from 2.6 to 3.2.[5,18-21] Still lower averages were seen in studies in Nepal,[22] Tanzania,[23] Bangladesh,[24] and Lebanon.[25] This divergence from the recommended value can be attributed to various reasons like unnecessary addition of micronutrient supplements,[5] promotion of aggressive treatment protocols[26] or expectation of the patients.[27] Post-intervention effects worsen this finding to 3.46 per encounter which may be due to economic incentives and constraints such as ineffective supply systems, lack of regulations and information system, encouraging irrational prescribing[28] or this may be due to "Howthorne phenomenon" as physicians being informed were more meticulous in eliciting complete history of the patients and writing more number of

drugs. Inclusion of generic drug in the prescription was low (54.8%) in the baseline data similar to findings of other studies from India.[5,29,30] Our intervention was effective in shifting inclusion of generic drugs and that from the EDL significantly but it was still below the prescribed norm. Studies by Mastura and Teng[31] and Vallès et al.[32] with some methodological and interventional difference from our study showed a similar change after intervention. Percentage of antibiotics and injection prescribed per encounter were similar to study by Biswas et al.[33] but lower than other studies like Hazra et al.,[5] Maini et al.,[21] Rehan et al.[34] in India. However, lower figures of antibiotic prescribing similar to our study were shown by studies in other developing countries such as Nepal[22] and Bangladesh.[24] Our intervention failed to score in these fronts of appropriate use of antibiotics required to prevent resistance and reduction in use of injection necessary to prevent blood borne infections. The possible reasons for ineffectiveness of intervention in improving antimicrobial prescriptions may be due to high incidence of infectious diseases in India, antimicrobial prescription for uncomplicated acute infection mostly of viral origin,[35] parental pressure and having insufficient time to educate patients about ineffectiveness of antibiotics in viral diseases.[36-38] Cultural belief of superiority of injectable drugs over oral forms and physicians voluntary effort to put more attention on individual symptoms may be the reason of ineffectiveness of our intervention for injectables.[39] Our intervention was successful in improving completeness of prescription writing patterns except for advice and signature with the name similar to study by Garjani et al.,[28] Mallet et al.,[40] Burmester et al.[41]

Our study has its strengths in combining more than one intervention like behavioral change approach with the managerial approach, being both active in providing real time feedback to their perception and passive by providing material for good prescribing practices. Limitations of the study lie in the absence of the control group which would make it more relevant to assess the impact and study was conducted in a single setting, i.e., in a secondary level hospital so its results may not be generalized. Finally, our intervention only included physicians but some of the studies showed interventions including both patient and physician had promising results.[42,43]

CONCLUSIONS

It is a well-known fact that physicians prescribing practices are inadequate in terms of completeness and rationality. To improve the quality of prescription, many interventions were tried previously either in the form passive dissemination of information or active strategies like audit/feedback, managerial approach, etc., with varied results. Passive strategies were mostly ineffective but when combined with active strategies it becomes effective. Our study combined both passive strategies like CME, providing physicians with ideal prescription format, EDL and active strategies sharing physicians' perceptions from baseline survey data, and administrative approach from the institution. This multi-pronged approach showed some positive results like improvement in the completeness of prescriptions, inclusion of generic drugs, and essential drugs in the prescription. Hence, it may be debated that as our interventions only focused on physicians these parameters showed improvement. Our study did not show a significant improvement in parameter where patient may play some role like antibiotic and injectables prescription. We strongly recommend that holistic interventions which should involve both physicians and patients/parents for improving quality of prescription. Another concern is the sustainability of such interventions which will cut down the cost of medication and help in establishing faith of patients on the health care system by improving good prescribing and dispensing practices in the long run.

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