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

Dipanweeta Routray1, Jyotiranjan Sahoo1*, Prateek Singh1, Kulen Das2, Satyavir Singh1

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 polypharmacy, 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. 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 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 (Q1-Q3) 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 (N=250) | Post-intervention (N=867) | p value* |
|---------------------|---------------------------|---------------------------|----------|
| Total number of drugs | 3 (2-4) | 4 (3-5) | 0.603 |
| Generic drugs | 2 (1-3) | 3 (2-3) | <0.001 |
| Antibiotics | 1 (0-1) | 1 (0-1) | 0.399 |
| Injections | 0 (0) | 0 (0) | 0.437 |
| EDL | 3 (2-3.25) | 3 (3-4) | 0.008 |

*Wilcoxon signed rank, EDL: Essential drug list

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 |
|----------------------------|--------------------------------------------------------|---------|
| 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 |

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 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, Omojasola et al., Theodorou et al. and Shrank et al.

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. 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. This divergence from the recommended value can be attributed to various reasons like unnecessary addition of micronutrient supplements, promotion of aggressive treatment protocols or expectation of the patients. 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 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 prescriptions included: “lack of time,” “lack of the 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 incomplete prescriptions 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 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 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, Omojasola et al., Theodorou et al. and Shrank et al.

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. 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. This divergence from the recommended value can be attributed to various reasons like unnecessary addition of micronutrient supplements, promotion of aggressive treatment protocols or expectation of the patients. 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 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 prescriptions included: “lack of time,” “lack of the 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 incomplete prescriptions 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.
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 of 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.

ACKNOWLEDGMENTS

We thank respondents for their cooperation and special thanks to Dr. Kirti Bhushan, Medical Superintendent MVH for his technical support during the course of study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Ethical issues were discussed & written permission was taken from the Medical Superintendent of the hospital

REFERENCES

1. Haldar D, Naskar TK, Sarkar TK, Ray SK, Taraphdar P, Biswas A. Prescribing and dispensing pattern: implication in the right of access to essential medicine. Health. 2011;2(4):143-7.
2. Karande S, Sankhe P, Kulkarni M. Patterns of prescription and drug dispensing. Indian J Pediatr. 2005;72(2):117-21.
3. Paniz VM, Fassa AG, Maia MF, Domingues MR, Bertoldi AD. Measuring access to medicines: a review of quantitative methods used in household surveys. BMC Health Serv Res. 2010;10:146.
4. Access to Essential Medicines. The World Medicines Situation. Geneva: World Health Organization; 2004. Available at http://apps.who.int/medicinedocs/en/d/Js6160e/9.html. Accessed 10 Jan 2014.
5. Hazra A, Tripathi SK, Alam MS. Prescribing and dispensing activities at the health facilities of a non-governmental organization. Natl Med J India. 2000;13(4):177-82.
6. MSH, WHO. Managing Medicine Supply – The Selection, Procurement, Distribution and Use of Pharmaceuticals. 2nd Edition. West Hartford: Management Science for Health, Euro Health Group and WHO Collaboration, Action Programme on Essential Medicines; 1997.
7. National Pharmaceuticals Pricing Policy, 2012 (NPPP-2012). Available at http://www.pharmaceuticals.gov.in/NPPP2012.pdf. Accessed 15 Jan 2014.
8. World Health Organization. Equitable access to essential medicines: a framework for collective action, 2004. Available at http://www.whoibdoc.who.int/hq/2004/WHO_EDM_2004.4.pdf. Accessed 15 Feb 2014.
9. International Network for Rational Use of Drugs and World Health Organization. How to Investigate Drug use in Health Facilities: selected Drug use Indicators. EDM Research Series No. 7 [WHO/DAP/93.1]. Geneva: World Health Organization; 1993.
10. Razon Y, Ashkenazi S, Cohen A, Hering E, Amzel S, Babilsky H, et al. Effect of educational intervention on antibiotic prescription practices for upper respiratory infections in children: a multicentre study. J Antimicrob Chemother. 2005;56(5):937-40.

11. World Health Organization. Interventions and Strategies to Improve the Use of Antimicrobials in Developing Countries: a Review. [WHO/CDS/CSR/DRS/2001.9]. Switzerland: World Health Organization; 2001.

12. Shapiro E. Injudicious antibiotic use: an unforeseen consequence of the emphasis on patient satisfaction? Clin Ther. 2002;24(1):197-204.

13. Banerjee I, Bhadury T. Prescribing pattern of intern in a primary health center in India. J Basic Clin Pharm. 2014;5(2):40-3.

14. Omojasola A, Hernandez M, Sansgiry S, Jones L. Perception of generic prescription drugs and utilization of generic drug discount programs. Ethn Dis. 2012;22(4):479-85.

15. Theodorou M, Tsiantou V, Pavlakis A, Maniadakis N, Fragoulakis V, Pavi E, et al. Factors influencing prescribing behaviour of physicians in Greece and Cyprus: results from a questionnaire based survey. BMC Health Serv Res. 2009;9:150.

16. Shrank WH, Liberman JN, Fischer MA, Girdish C, Brennan TA, Choudhry NK. Physician perceptions about generic drugs. Ann Pharmacother. 2011;45(1):31-8.

17. Isha AO, Laing R, Quick J, Mabadeje AFB, Santoso B, Hogerzell H, et al. Development of reference values for the WHO health facility core prescribing indicators. West Afr J Pharm Pharmacol Drug Res. 2002;18:6-1.

18. Adebayo ET, Hussain NA. Pattern of prescription drug use in Nigerian army hospitals. Ann Afr Med. 2010;9(3):152-8.

19. Bhartiy SS, Shinde M, Nandeshwar S, Tiwari SC. Pattern of prescribing in ambulatory care in Lebanon. Ann Int Med. 2001;72(2):265-71.

20. Alam K, Mishra P, Prabhu M, Shankar PR, Palatan S, Bhandari RB, et al. A study on rational drug prescribing and dispensing in outpatients in a tertiary care teaching hospital of Western Nepal. Kathmandu Univ Med J (KUMJ). 2008;6(1):55-9.

21. Maini R, Verma KK, Biswas NR, Agrawal SS. Drug utilization study in dermatology in a tertiary hospital in Delhi. Indian J Physiol Pharmacol. 2002;46(1):107-10.

22. Afrin ML, Malek AH, Miah T, Hussain M, Sarker T, Ali J, et al. Antibiotic use in a rural area of Bangladesh. East Mediterr Health J. 2009;15(2):408-15.

23. Nsimba SE. Assessing prescribing and patient care indicators for children under five years old with malaria and other disease conditions in public primary health care facilities. Southeast Asian J Trop Med Public Health. 2006;37(1):20-7.

24. Garry R, Reis AJ, Pooch AM, Young TM, Owusu-Ansah S, Nduka IO, et al. Patient satisfaction and adherence to antimalarial treatment. Trop Med Int Health. 2004;9(11):353-9.

25. Hamadeh GN, Dickerson LM, Saab BR, Major SC. Common prescriptions in ambulatory care in Lebanon. Ann Pharmacother. 2001;35(5):636-40.

26. Salazary JA, Poon I, Nair M. Clinical consequences of polypharmacy in elderly: expect the unexpected, think the unthinkable. Expert Opin Drug Saf. 2007;6(6):695-704.

27. Viktil KK, Blix HS, Reikvam A. The Janus face of polypharmacy – Overuse versus underuse of medication. Nor Epidemiol. 2008;18(2):147-52.

28. Garjani A, Salimnejad M, Shamshohamadi M, Baghchevan V, Vahidi RG, Maleki-Dizaji N, et al. Effect of interactive group discussion among physicians to promote rational prescribing. East Mediterr Health J. 2009;15(2):408-15.

29. Rehan HS, Lal P. Drug prescribing pattern of intern at a government healthcare centre in Northern India. Trop Doct. 2002;32(1):4-7.

30. Rishi RK, Sangeeta S, Surendra K, Tailang M. Prescription audit: experience in Garhwal (Uttaranchal), India. Trop Doct. 2003;33(2):76-9.

31. Mastura I, Teng CL. The effect of “group detailing” on drug prescribing in primary care. Med J Malaysia. 2008;63(4):315-8.

32. Valles JA, Barreiro M, Cereza G, Ferro JJ, Martinez MJ, Escribà JM, et al. A prospective multicenter study of the effect of patient education on acceptability of generic prescribing in general practice. Health Policy. 2003;65(3):269-75.

33. Biswas NR, Biswas RS, Pal PS, Jain SK, Malhotra SP, Gupta A, et al. Patterns of prescriptions and drug use in two tertiary hospitals in Delhi. Indian J Physiol Pharmacol. 2000;44(1):109-12.

34. Rehan HS, Singh C, Tripathi CD, Kela AK. Study of drug utilization pattern in dental OPD at tertiary care teaching hospital. Indian J Dent Res. 2001;12(1):51-6.

35. Indirakumari S, Chandy SJ, Jeyaseelan L, Kumar R, Suresh S. Antibacterial prescription patterns for common acute infections in some rural & urban health facilities of India. Indian J Med Res. 2008;128(2):165-71.

36. Nyquist AC, Gonzales R, Steiner JF, Sande MA. Antibiotic prescribing for children with colds, upper respiratory tract infections, and bronchitis. JAMA. 1998;279(11):875-7.

37. Welschen I, Kuyvenhoven M, Hoes A, Verheij T. Antibiotics for acute respiratory tract symptoms: patients’ expectations, GPs’ management and patient satisfaction. Fam Pract. 2004;21(3):234-7.

38. Colgan R, Powers JH. Appropriate antimicrobial prescribing: approaches that limit antibiotic resistance. Am Fam Physician. 2001;64(6):999-1004.

39. McVea KL. Lay injection practices among migrant farmworkers in the age of AIDS: evolution of a biomedical folk practice. Soc Sci Med. 1997;45(1):91-8.

40. Mallet HP, Nijiam A, Scoufiaire SM. Evaluation of prescription practices and of the rational use of medicines in Niger. Sante. 2001;11(3):185-93.

41. Burmester MK, Dionne R, Thiagarajan RR, Laussen PC. Impact of feedback on prescribing in anaesthesia: a prospective study. Intensive Care Med. 2004;30(4):680-5.

42. Vauchery JP, Simon AE, Giudicelli B. Effect of feedback on antibiotic prescribing in patients with chest pain. J Intern Med. 2005;257(5):524-32.

43. De Santis G, Harvey KJ, Howard D, Mashford ML, Young T, Laskay R, et al. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2004;58(12):962-6.

44. Doan NM, O’Neil BJ, Sherrard DJ, Young T, Maddison PJ. Antibiotic prescribing in the emergency department: impact of feedback. BMJ. 2005;330(7491):1061-2.

45. Doan NM, O’Neil BJ, Sherrard DJ, Young T, Maddison PJ. Antibiotic prescribing in the emergency department: impact of feedback. BMJ. 2005;330(7491):1061-2.

46. Curtis JA, O’Neil BJ, Young T, Maddison PJ. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2005;59(9):1051-4.

47. Curtis JA, O’Neil BJ, Young T, Maddison PJ. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2005;59(9):1051-4.

48. Curtis JA, O’Neil BJ, Young T, Maddison PJ. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2005;59(9):1051-4.

49. Curtis JA, O’Neil BJ, Young T, Maddison PJ. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2005;59(9):1051-4.

50. Curtis JA, O’Neil BJ, Young T, Maddison PJ. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2005;59(9):1051-4.

51. Curtis JA, O’Neil BJ, Young T, Maddison PJ. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2005;59(9):1051-4.

52. Curtis JA, O’Neil BJ, Young T, Maddison PJ. The impact of feedback on antibiotic prescribing in the emergency department. Int J Clin Pract. 2005;59(9):1051-4.