COMPARATIVE EVALUATION OF SERIAL PRESCRIPTION AUDITS ON QUALITY OF PRESCRIPTION BEHAVIOUR IN TERTIARY HEALTH CARE CENTRES OF NORTH INDIA AND NORTHWEST INDIA

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ABSTRACT

BACKGROUND

The universal health coverage in developing countries including India requires access to essential medicines at affordable prices which can only be achieved with rational prescription behaviour of the prescriber.

Aims- The main objective of this study was to study and compare the impact of serial prescription audits with active feedback on the prescription behaviours of the prescribers of two tertiary health care centres.

Setting and Design- This is retrospective data-based cross sectional study conducted in outpatient department of Jhalawar Medical College and Hospital, Rajasthan (North-Western India, designated as Institution-I) and Chintpurni Medical College and Hospital, Punjab (Northern India, designated as Institution-II) for total of two years.

MATERIALS AND METHODS

A comparative study of serial prescription audits in four cycles (three months each) was conducted at Jhalawar Medical College and Hospital, Rajasthan and at Chintpurni Medical College and Hospital, Punjab for two years, one year i.e. two cycles in each hospital. One cycle included the prescriptions which were collected by using a digital camera from the outdoor patient departments every month (n=250 per month), for three months regularly. One cycle was followed by three months of no prescription audit. The serial prescription audits in two tertiary health care centres were compared. The parameters which were observed were- (a) the formats of the prescriptions (b) the WHO drug core indicators and (c) the legibility of the prescriptions as decided upon by the consensus group.

Statistical Analysis-The data was analysed by using the Chi-square test.

RESULTS

A significant improvement was seen in parameters of prescription format and the WHO drug core indicators at the end of the 2nd and 3rd months of all cycles in both tertiary health care centres ($p<0.05$). The clarity of the prescriptions improved in the successive re-audits. However, there was not statistically significant difference in baseline as well as degree of improvement in abovementioned parameters when two tertiary health care centres were compared.

CONCLUSION

Serial prescription audits and an active feedback definitely motivate the prescribers to write a rational prescription. But discontinuing the prescription audits reverses the improvement.

KEYWORDS

Serial Audits, WHO Drug Indicators, Prescription Behaviour.

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BACKGROUND

Prescribing drugs is an important skill which needs to be continuously assessed and refined accordingly. It brings into focus the diagnostic acumen and therapeutic proficiency of the physician with instructions for palliation or restoration of the patient's health.[1,2] Moreover prescriptions are medicolegal documents often used for as well as against the physician.[3]

Highest standards of health care delivery can only be achieved through rational drug use because of medical, psychosocial, and financial implications.[4] A method of measuring these standards is known as medical audit.[5] A rational prescription is a backbone of rational drug use.

An "audit' consists of review as well as evaluation of health care procedures to compare the quality of care with acceptable standards[6] whereas medical audit comprises of monitoring and evaluating the prescribing practices of medical practitioners for the purpose of making medical care rational and cost effective.[7]

Prescribing faults and prescription errors are major problems among medication errors both in general practice and in hospital.[8] In developing regions, irrational and often incorrect use of drugs appears to be widespread.[9] Didactic sessions and a passive dissemination of guidelines are not

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effective means of modifying the prescriber's behaviour. However, quality of prescribing can be improved successfully by combining prescription audits with feedback.[10] Continuous assessment and refinement of drug prescription behaviour are required to provide optimum, cost-effective treatment, and to ensure minimal hospitalisations due to adverse side effects.[11] World Health Organization (WHO) has recommended periodic assessment of the use of core drug prescribing indicators as first line measures for assessment and as guidance for actions required to enhance patient safety through rational drug prescribing behaviour.[4]

Although the feedback after audit should be generalised but it has been seen that individualised feedback is effective in improving the prescription behaviour as per treatment guidelines. Few studies have documented the impact of serial prescription audits and feedback on the quality of the prescription behaviour.[12] In addition to this, the prescription behaviour of the prescribers from two different parts of India was compared in this study along with the focus on duration of this impact.

MATERIALS AND METHODS

This study was conducted as per regulatory guidelines of Schedule-Y and the Indian Council of Medical Research (ICMR). The Institutional Ethics Committee (IEC) approval from each institution was received before the initiation of this study. Serial prescription audits were conducted first at Jhalawar Medical College, Rajasthan (North-Western India and designated as Institution-I) in two cycles and then at Chintpurni Medical College, Punjab (Northern part of India and designated as Institution-II) in two cycles for one year in each (for a total of 2 years) of these two hospitals. The prescriptions were collected with a digital camera from the outdoor patient departments of institution-I first month (n=250 per month). The baseline audit as cross-sectional survey was done on the last date of the month and the prescribers were provided with the feedback. This process is continued for next two more months i.e. 2nd and 3rd re-audits were done on last date of second and third month with active feedback which concluded one cycle (total n=750 for three months i.e. one cycle). This is followed by the period of three months of no prescription audit and the next cycle was repeated in the same way at institution-I after the gap of three months making total duration of two cycles one year. Similar two cycles of the study were conducted with continuous evaluation and a feedback process at institution-II for one year (a total of four cycles were completed in two years). The total baseline value of each parameter for first months of two cycles at Institution-I was compared with that of Institution-II. In same way Institution-I and Institution-II were compared for second and third months of two cycles in each institution. The data was analysed by using the Chi-square test.

Following parameters were used to analyse the data- (a) details of the standard formats of the prescriptions (b) the WHO drug core indicators[13] and (c) legibility of the prescriptions.[12] These parameters were assessed and an evaluation was done on the basis of the extent of conformity to guidelines provided by- WHO policy perspective on medicines,[13] WHO-the rational use of drugs,[14] the WHO guide to good prescribing[15] and the updated WHO list of Essential Medicines.[16]

The details of the parameters used were as under:

1. **For the Prescription Format**
   a. Name, age and address of the patient for identification.
   b. Date of prescription.
   c. Superscription: The symbol, Rx signifies recipe or "take thou".
   d. Inscription: All information regarding medication.
   e. Subscription: Dispensing direction for the pharmacist.
   f. Transcription: Directions to the patient as to how to take the drugs.
   g. Prescriber identity: Signature, name, address and qualification of the prescriber.

2. **The WHO Core Drug Use Indicators[13] were as Under:**
   a. The average number of drugs per encounter.
   b. The percentage of the drugs which were prescribed by generic names.
   c. The percentage of the encounters with an antibiotic which was prescribed.
   d. The percentage of encounters with an injection which was prescribed.
   e. The percentage of drugs which were prescribed from the essential drugs list or formulary.

3. **Legibility of the Prescriptions**[12]
   Legible prescriptions have been defined as "easily readable by someone who is not familiar with the context examined". It also included the correct use of approved abbreviations with clarity which was considered to be a composite of a number of individual features including legibility.

The initial assessment of the legibility and clarity was done by selecting those prescriptions which were difficult to read and likely to cause confusion to health care staff including pharmacist. These prescriptions were assigned a score of '1' or '2' and reassessed by a consensus group, which included a pharmacist and a physician. A second consultant physician was consulted in case of a discrepancy between the scores assigned by the consensus group [Table 1].

RESULTS

During the study period, 1500 prescriptions were collected from institution-I and 1500 prescriptions were collected from institution-II for analysis in two cycles each and each cycle included 3 months and 750 prescriptions (n=250 per month). The total baseline data of two cycles for the first, second and third months (data of 1st, 2nd and 3rd audit of two cycles) from Institution-I were compared with that of Institution-II by using all parameters mentioned in the study.

While comparing the baseline data for the first month from two institutions, it was found that patients' identities were documented in all the prescriptions from both the institutes. The date was not mentioned in only one prescription collected from institution-II. 17.2% prescriptions from institution-I and 16.2% from institution-II were found with inadequate superscriptions. As far as the inscriptions were concerned, they were not clear in 16.3% prescriptions from institution-I as compared to 15.2% from institution-II. The percentage use of generic drugs were

48.56% in institution-I and 49.68% in institution-II i.e. the prescribers preferred brand names. The use of abbreviations like HS, SOS, OD, and BID was found to be common. The subscriptions were found inadequate in 17.5% of the prescriptions at institution-I and 16% from institution-II whereas the transcriptions in 26.5% of the prescriptions at institution-I and 25.2% at institution-II were unsatisfactory i.e. the instructions about refills or caution were not mentioned. The prescriber's identity was without signature and/or the name of the prescriber in 5.5% of the prescriptions from institution-I and 4.3% from institution-II.

While comparing with the total baseline value of each parameter for first months of two cycles at institution-I with that of institution-II and similarly for second and third months of two cycles in each institute, it was found that although the process of audit and active feedback resulted in an overall statistically significant improvement in all the indicators of the prescription format within both institutions, there was no difference of improvement when two institutions were compared. [Table 2].

Similar comparison was also made for WHO core drug indicators with successive re-audits and active feedback. A significant improvement was found in the WHO core drug indicators with every re-audit within each cycle in each institute. Total percentage of each drug core indicator for the first, second and third months of both the cycles in institution-I was compared with that of institution-II. There was reduction in average number of drugs per encounter from the baseline level of 3.27 to 2.3 at institution-I and from 3.35 to 2.5 at institution-II in the third month. The percentage of the drugs which were prescribed by their generic names was increased to 96.72% in institution-I and 97.82% in institution-II from the initial baseline level of 48.56% and 49.68% respectively while percentages of antibiotics and injections which were prescribed had reduced to 30.5% and 10.2% in institution-I; and 29.8% and 10.8% in institution-II respectively. The percentage of the drugs from the essential drug list had increased to 95.3% and 96.32% from its baseline level of 70.48% and 71.52% at institution-I and institution-II respectively. [Table 3].

The percentage of prescriptions with proper legibility and clarity were increased significantly while comparing the baseline audit with subsequent re-audits. [Table 4].

However, there is no significant difference between all the baseline indicators at first audit and degree of improvement after re-audits when two institutions were compared for first, second and third month. Further, there was reversal of the improvement in the prescription behaviour in both institutions to the baseline levels with discontinuation of prescription audits and active feedback after every cycle.

Score	Standard	Meaning
0	Clear	Standard of clarity is such that the prescription can easily be read and interpreted, and acted on with confidence
1	Some difficulty with clarity	Standard of clarity is such that there is difficulty in reading and/or interpreting one or more parts of the prescription and there is a possibility of Misinterpretation.
2	Unclear	Standard of clarity is such that the one or more parts of instructions/meaning cannot be fully discerned and the prescription cannot be acted on with confidence.

Table 1. Scoring Tool for Legibility of Prescriptions

Details of Prescription	First Month		Second Month		Third Month	
	*Inst.- I	**Inst.- II	Inst.- I	Inst.- II	Inst.- I	Inst.- II
Superscription	82.80	83.75	87.98	88.9	94.5	95.8
Inscription	83.68	84.72	87.00	88.00	91.7	92.8
Subscription	82.45	83.97	87.7	88.8	91.2	93.3
Transcription	73.5	74.8	76.8	77.9	84.5	85.3
Prescriber's identity	94.5	95.7	96.2	97.9	98.1	99.8

Table 2. Comparative Percentage Improvement in the Format of Prescription

***Inst.-I: Institution-I, **Inst.-II: Institution-II**

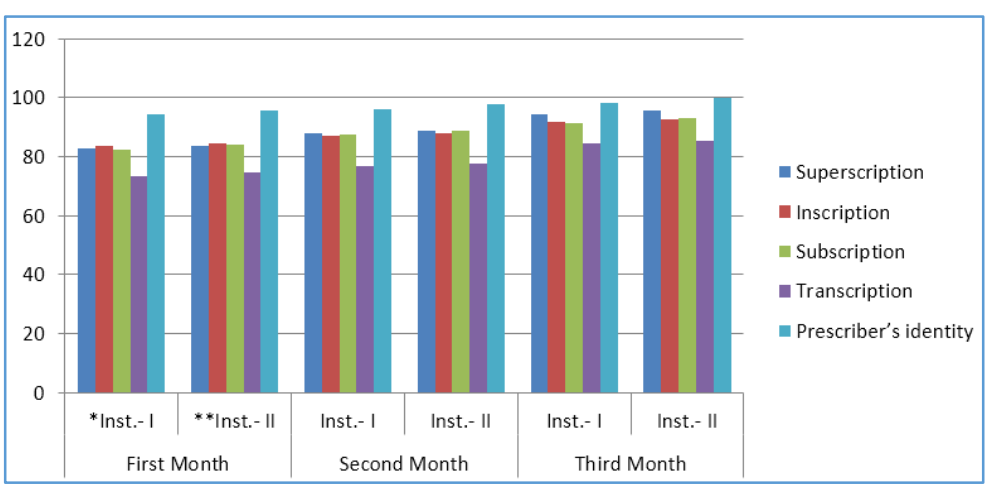

Figure 1. Comparative Percentage Improvement
****Inst.-I: Institution-I, **Inst.-II: Institution-II***

WHO Indicator	First Month		Second Month		Third Month	
	*Inst.- I	**Inst.- II	Inst.- I	Inst.- II	Inst.- I	Inst.- II
Average no. of drugs per encounter	3.27	3.35	2.67	2.78	2.3	2.5
Percentage of drugs prescribed by generic name	48.56	49.68	53.70	54.86	96.72	97.82
Percentage of encounters with antibiotic prescribed	51.5	52.7	44.1	45.2	30.5	29.8
Percentage of encounters with injection prescribed	19.51	18.56	17.11	16.15	10.2	10.8
Percentage of drugs prescribed from essential drug list	70.48	71.52	80.51	79.55	95.30	96.32

Table 3. Comparative Improvement in WHO Drug Core Indicators

***Inst.-I: Institution-I, **Inst.-II: Institution-II**

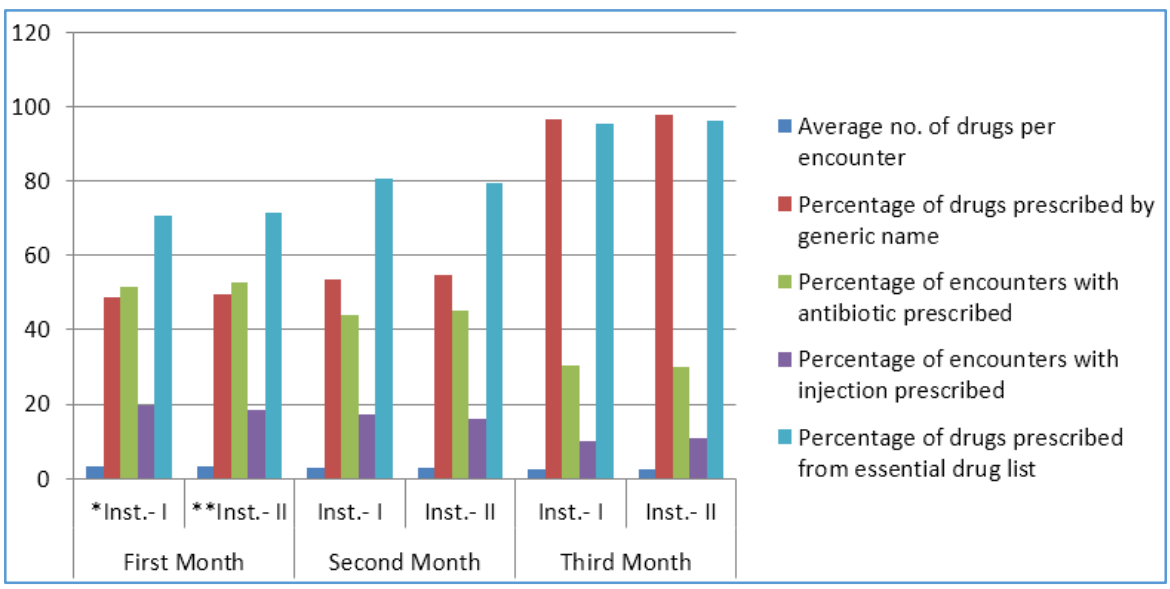

Figure 2. Comparative Percentage Improvement *Inst.-I: Institution-I, **Inst.-II: Institution-II

	First Month		Second Month		Third Month	
	*Inst.- I	**Inst.- II	Inst.- I	Inst.- II	Inst.- I	Inst.- II
Illegible	5.4	5.6	2.2	2.3	1.1	1.2
Abbreviations	2.4	2.6	1.0	1.2	0.1	0.1
Omissions	1.1	1.2	0.5	0.6	0.1	0.1

Table 4. Comparative Percentage Improvement in Legibility of Prescriptions

***Inst.-I: Institution-I, **Inst.-II: Institution-II**

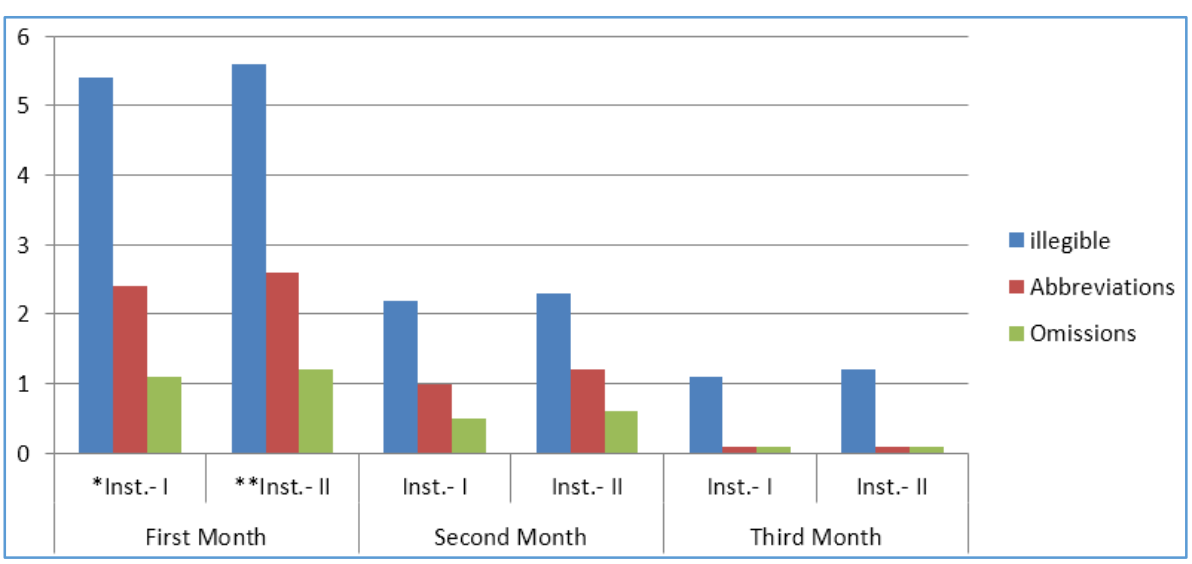

Figure 3. Comparative Percentage Improvement *Inst.-I: Institution-I, **Inst.-II: Institution-II

DISCUSSION

The prescription audits are important in the health services as a first step to improve the quality as an instrument to devise healthcare strategies and accreditation processes but it should be carried out regularly as an educational activity. Further to reduce the risk of medication errors, clinical audit acts as a simple tool for evaluating the actual performance and in planning corrective actions.[17]

As reviewing the published literature, it is found that a majority of the studies were focused on the outcomes regarding improved compliance and adherence to treatment guidelines and only few studies were revealed to assess the impact of repeated cycles of re-audits on clinical outcome and prescription behaviour.

Clinical audits are popular measure for quality improvement in healthcare but these are designed to measure the degree of adherence to the treatment guidelines. Moreover many clinical audits don't reach the stage of re-audit and still fewer pursue the repeated cycles of the re-audits. For a clinical audit to be effective, it should have components including proper methodology and repeated cycles in order to improve various clinical outcomes.[18,19]

The purpose of the study was to compare the prescription behaviour of the prescribers of two tertiary health care centres from different parts of India by using tool of serial prescription audits with active feedback. In addition our focus was to ascertain the duration of the impact on prescription behaviour. The study revealed that there was significant increase in percentage of rational prescriptions with proper prescription format as per prescription guidelines with each subsequent re-audits. Further, legibility as well as clarity of prescriptions went on improving significantly with serial audits. This improvement in prescription behaviour was seen in both the institutions but difference in degree of improvement was not statistically significant when two institutions were compared in terms of above parameters. Similarly, there was significant improvement in the WHO core drug indicators with the successive re-audits in each institution.

We have come across a previous study on prescription audit where improvement in legibility and clarity of the prescription was documented along with improvement in percentage of the encounters with the antibiotics prescribed (one of WHO core drug indicator) with serial audits.[12]

However, there was decline in improvement of prescription behaviour even reversed to the baseline level with discontinuation of prescription audits and active feedback after every cycle. This shows that continuous assessment and feedback play key role to maintain rational prescription behaviour among prescribers. Similar results may be achieved by conducting surprise serial audits along with an active feedback throughout the year.

Further there is no statistically significant difference between baseline prescription indicators and degree of improvement of the indicators in serial audits when two institutions from different parts of India were compared. Surprisingly prescription behaviour of the prescribers from two different institutions followed the same pattern including decline in improvement during the period of no audit.

CONCLUSION

This study highlights the need of continuous assessment of prescription behaviour of the prescribers with serial audits and active feedback by using its proper methodology to identify the problems which are involved in the therapeutic decision making and to improve various clinical outcomes. Serial prescription audits definitely cause improvements in the prescription behaviour but this improvement tends to decline with discontinuation of the prescription audits. One of the solutions of this problem may be conduction of surprise serial prescription audits regularly. In this study, the pattern of prescribing behaviour is found to be similar in tertiary healthcare institutions from two different parts of the country.

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