

## Original Research Article

# A comparative study of drug prescribing indicators in various hospitals of West Bengal, India

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### ABSTRACT

**Background:** Rational use of drugs is essential to ensure safety and welfare of patients. Thus, prescription audits are conducted to monitor the practice of writing prescriptions. Various standard parameters have been rationalized by World Health Organization (WHO) in order to regulate drug utilization, globally. Present study aimed to compare the pattern of prescriptions generated in different healthcare centres of West Bengal.

**Methods:** A cross-sectional study was conducted in the inpatient and outpatient departments of RG Kar Medical College, Kolkata, in order to evaluate the prescriptions. Literature was also surveyed with the keywords “prescription audit”, “West Bengal”, to extract data on prescription audits conducted in various other hospitals of West Bengal. The WHO prescribing indicators of all these health facilities were then compared to estimate the rationality of drug prescribed by different physicians.

**Results:** Seven published reports of prescription audits were published from the period of 2013 to 2017, the distribution being- 2 health facilities from Kolkata, 2 from Burdwan, 1 each from Bankura, Murshidabad and North Bengal. WHO standards were not strictly followed by any of the hospitals. Polypharmacy level were higher in all the hospitals. Drugs were mostly prescribed from the essential medicine list (EML).

**Conclusions:** Present study clearly indicated that it is essential to improve these parameters for most of the healthcare centres in order to prevent irrational use of drugs. Prescription audits should also be implemented regularly so that the patients can receive better treatment at minimum cost with suitable rational therapy.

**Keywords:** Audits, Drugs, Injections, WHO prescribing indicators

### INTRODUCTION

Prescription is a written instruction provided by the physician to guide the patient for his/her medical treatment. It contains information regarding prescribers, details about the patient, the disease, relevant advice and guidance for the patient. Prescription writing is an important aspect of the therapy, which needs to be continuously assessed and refined suitably and it reflects the physician's skill in the diagnosis and attitude towards selecting the most appropriate cost-effective treatment. Improvement of the standard of medical treatment will enhance the quality of life of patients. These standards are guided and overviewed by prescription audit. An

‘audit’ is defined as ‘the review and the evaluation of the health care procedures and documentation for the purpose of comparing the quality of care which is provided, with the accepted standards.<sup>1</sup> Audit was first implemented by Florence Nightingale in 1854 to prevent post-surgical mortality.<sup>2</sup> For rational and cost-effective medical care, standardized prescription pattern is of utmost important. The quality of prescribing practices of the physicians is identified by the audit. Poor prescriptions enhance the risk of medical errors and therefore increase patient suffering. A combination of prescription audits and feedback to the prescribers is known to be a successful technique which improves the quality of the prescribing. A clinical audit is designed to measure the compliance

with the standards of the proven clinical practice and to record the required and the documented changes in the clinical practice, which are shown by the re-audits.<sup>3</sup> World Health Organization (WHO) proposed core-prescribing indicators for prescription audit and drug utilization studies.<sup>4</sup> Appropriate use of medicines by healthcare providers can be estimated by these prescribing indicators.

These indicators were standardized based on the treatments practiced in different outpatient departments of few health facilities. The prescribing tendency in a given set up was evaluated independent of the problem or diagnosis. Average number of drugs per encounter was represented as the degree of polypharmacy. The tendency of prescription by generic name was also measured. The antibiotics and injections encountered per prescriptions was evaluated. Physicians should prescribe drugs from essential drugs list as indicated by national drug policy. WHO indicators are used to measure the degree of compliance to which practitioners prescribe from the national essential medicine list.<sup>4</sup> Prescription audit has been conducted in various healthcare centres around the world, including India. Present study tried to estimate the rational use of drugs in different healthcare facilities of West Bengal, India. Literature has reported a number of studies on prescription audit in different districts of West Bengal. Present study also tried to compare the WHO prescribing indicators, as documented in different hospitals of West Bengal along with that obtained from the outpatient and inpatient departments of this tertiary care hospital.

**METHODS**

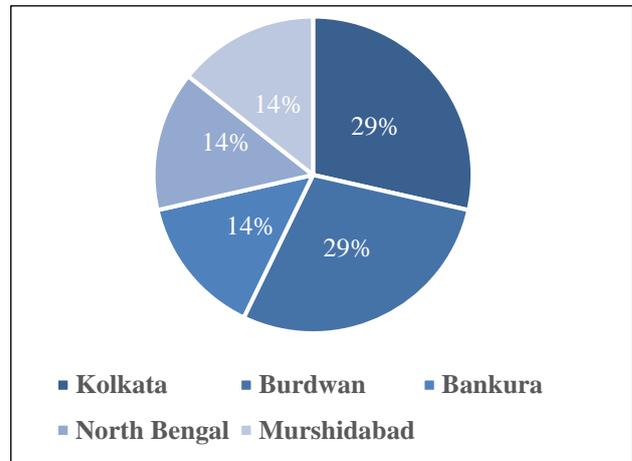
A one-day cross-sectional observational study was conducted with prior permission from administration and Institutional Ethical Committee. Prescriptions from different in patient departments (IPDs) and Out Patient Departments (OPDs) were collected on a single date and these prescriptions were evaluated, following national and international guidelines. The prescribing physicians were unaware that prescriptions were being audited. Collection of prescriptions was done on the respective patients based on different departments. Prescriptions generated on the day just before the audit was considered and collection of prescriptions was random.

Prescription audit reports from other hospitals in West Bengal, were collected by Google search, with keywords “Prescription audit”, “WHO Prescribing Indicators” and “West Bengal”. The WHO prescribing indicators from all these prescriptions of the present study and data available from literature were compared to access the level of rational drug use practiced in West Bengal.

**RESULTS**

Present study evaluated prescription audits conducted in different healthcare centres of various districts of West

Bengal. Seven (7) reports of prescription audits were published, the distribution being-two (2) from Kolkata, two (2) from Burdwan, one (1) each from Bankura, Murshidabad and North Bengal (Figure 1).



**Figure 1: Distribution of different districts of West Bengal reporting prescription audits.**

Comparison of WHO indicators in different hospitals of West Bengal evaluated that the prescriptions containing generic name were highest in North Bengal Medical College, 95.3% followed by 93% at OPD of RG Kar Medical College (Table 1). Medicines with generic names were significantly lower at Bankura Sammilani Medical College (79.2%), IPD, RG Kar Medical College (71%), All India Institute of Hygiene and Public Health, Kolkata (69.3%), Murshidabad Medical College (34.97%), Chittaranjan rural hospital (32.2%), Burdwan Medical College (21%) and NRS Medical College (10.1%).

Percentage of drugs prescribed from EML were higher at North Bengal Medical College, 95.8% followed by 90% at OPD of RG Kar Medical College, 91.1% at Chittaranjan rural hospital, 85.5% at All India Institute of Hygiene and Public Health, Kolkata, 84% IPD, RG Kar Medical College, 65.2% at NRS Medical College, 61% at Burdwan Medical College, 58.5% at Murshidabad Medical College and 23.02% at Bankura Sammilani Medical College (Table 1).

Polypharmacy is a rough indicator of quality prescribing. Level of polypharmacy was found to be 5.29 in IPD of RG Kar Medical College, 4.4 in Burdwan Medical College, 3.2 in Bankura Sammilani Medical College, 3.05 in NRS Medical College, 3.01 in Chittaranjan rural hospital, 2.9 in OPD of RG Kar Medical College, 2.58 in Murshidabad Medical College, 2.5 in North Bengal Medical College and 2.14 in All India Institute of Hygiene and Public Health, Kolkata (Table 1). However, the level of polypharmacy was found to be higher than the WHO standards in all the healthcare centres.

Antibiotics are most important members in therapeutics. Antibiotics per prescription is an established indicator in drug utilization. The percentage of antibiotics per prescription were within WHO standard limits for three centres- Murshidabad Medical College (22.4%), Bankura Sammilani Medical College (23.06%) and IPD of RG Kar Medical College (23.06%). The use of antibiotics were highest at Chittaranjan rural hospital (71.87%).

Table 1 showed that prescription of injections were within WHO standards for OPD of RG Kar Medical College (1.72%), NRS Medical College (2.43%), North Bengal Medical College (2.8%), Bankura Sammilani Medical College (3.83%), Murshidabad Medical College (4.49%) and All India Institute of Hygiene and Public Health, Kolkata (8.6%). Use of injections were highest at the IPD of RG Kar Medical College (47.83%).

**Table 1: Comparison of who prescribing indicators of different healthcare centres of West Bengal.**

Prescribing Indicator Assessed	Percentage of prescriptions containing generic drug	Percentage of drugs prescribed from EML	Average number of drugs per prescription	Percentage of antibiotic prescribed	Percentage of injectable prescribed
WHO Reference Value <sup>4</sup>	100%	100%	1.6-1.8	20.0-26.8%	<10.0%
Study at RG Kar Medical College (IPD), Kolkata	71%	84%	5.29	23.06%	47.83%
Study at RG Kar Medical College (OPD), Kolkata	93%	90%	2.9	28%	1.72%
Study at NRS Medical College, Kolkata <sup>5</sup>	10.10%	65.20%	3.05	33%	2.43%
Study at Bankura Sammilani Medical College, Bankura <sup>6</sup>	79.19%	23.02%	3.2	23.06%	3.83%
Study at Chittaranjan rural hospital, Burdwan <sup>7</sup>	32.22%	91.06%	3.01	71.87%	11.87%
Study at All India Institute of Hygiene and Public Health, Kolkata <sup>8</sup>	69.30%	85.50%	2.14	39.40%	8.60%
Study at Burdwan Medical College, Burdwan <sup>9</sup>	21.00%	60.99%	4.4	28.90%	29.00%
Study at North Bengal Medical College, North Bengal <sup>10</sup>	95.30%	95.80%	2.5	47.80%	2.80%
Study at Murshidabad Medical College, Murshidabad <sup>11</sup>	34.97%	58.47%	2.58	22.40%	4.49%

## DISCUSSION

Prescription is a written recommendations provided by the clinicians to the patients. Therapeutic success thus depends largely on the prescription writing. It is essential to regulate prescription writing in order to maintain rationality in medical practice. Prescription audits are thus conducted to overview the prescriptions written by the physicians. Present study tried to compare the prescription audits reported from different hospitals of Kolkata. WHO prescribed that drugs should be prescribed with generic name. It was observed that 95.3% of the prescriptions were prescribed by generic names in North Bengal Medical College. However, generic name prescription was mostly higher in this state as compared to that reported in the study of Western (6.67%) and Southern (9.7%) India respectively.<sup>12,13</sup> However, studies

in Sri Lanka and Nigeria revealed generic name were used in 78% and 48.39% of the prescriptions, respectively.<sup>14,15</sup> Medicines prescribed from EML were less as compared to that specified by WHO. Similar results were obtained from another national study where 70% drugs were prescribed from EML.<sup>12</sup> A study from Pakistan revealed 98.8% drugs were prescribed from EML.<sup>16</sup>

Average number of drugs per prescription was found to be higher than that recommended by WHO. A study in Ghana revealed the level of polypharmacy, i.e., drugs per prescription, was 4.8, also exceeding the limit of WHO. Comorbid conditions in the present world compels the use of multiple medications. This was the reason for the increase in the level of polypharmacy in most of the studies reported in literature.<sup>17</sup> Irrational use of antibiotics of develops resistance in patients. WHO, therefore,

defined rational use of antibiotics as ‘the cost-effective use of antibiotics which maximizes clinical therapeutic effect while minimizing both drug-related toxicity and the development of antimicrobial resistance (AMR)’.<sup>18</sup>

However, use of antibiotics was also higher in most of the hospitals referred in the present study. Similarly, a study in Sri Lanka documented 47% of the prescriptions contained antibiotics.<sup>14</sup> The use of injections in most of the hospitals obeyed the WHO standards, as was found in Nagpur (1.6%).<sup>13</sup> Study in Ghana however, reported the use of injection was 80%, much higher than the WHO standards.<sup>17</sup> Inappropriate use of antibiotics and injections are influenced by different factors. Various socio-economic factors, inadequate training often leads to irrational use of antibiotics and injections.<sup>19</sup> Studies suggested that fear of losing patients compelled the physicians to use antibiotics and injections. High patient load and insufficient prescribers also leads to irrational prescribing of medicines.<sup>20</sup>

## CONCLUSION

Present study thus revealed the real scenario of prescription data of the healthcare facilities of West Bengal, deviating from the WHO standards, due to different reasons. Thus, it is the responsibility of the healthcare professionals to ensure rational use of drugs through implementation of WHO core indicators. Training and workshops should be arranged in order to create awareness among the physicians to enlighten the importance of rational drug use. Prescription audits also need to be conducted time to time to monitor the quality of prescriptions generated by the physicians.

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