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**RATIONAL USE OF MEDICINES: A REVIEW****Dr. Siddhartha Dutta\***

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**ABSTRACT**

In an effective pharmacotherapy, Rational Use of Medicines (RUM) play an indispensable role. RUM can be simplified as the medicines which prescribed should be for the right patient, appropriate to their clinical needs, in right doses, for right duration, right route and at a price which the patient and community can afford. Underuse, overuse, incorrect prescribing, extravagant prescribing and polypharmacy are common forms of irrational drug use in current scenario. Irrational use of medicine can lead to unacceptable health and financial ramifications. World Health Organization recommends establishment of Drugs and Therapeutics Committee and practice good prescribing to improve public health. Standard Treatment Guidelines (STGs) should be formulated by each and every country which can serve as a good guide for prescribing for their own region. Country wise data collected with the help of drug utilization studies, pharmacovigilance, pharmacoepidemiology and pharmaco-economic studies can help in formulating guidelines and plans which would help in proper imposition of RUM to ameliorate the quality of life and public health.

**KEYWORDS:** Rational use of medicines; WHO; Drug utilization studies; Pharmacovigilance, Standard Treatment Guidelines; Drugs and Therapeutics Committee.

**INTRODUCTION**

With the increasing diversity of the diseases and population, there is an increase in the usage of drugs for the treatment, prophylaxis and diagnosis of disease. The physicians are expected to prescribe the drugs rationally to each and every patient. The scenario, on the contrary, is completely different as quoted by World Health Organization (WHO) which states that irrational prescribing is a global issue.<sup>[1]</sup> As per WHO the Rational Use of Medicines (RUM) is "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community".<sup>[1]</sup>

**RESPONSIBLE USE OF MEDICINES**

As per the Technical Report prepared for the Ministers Summit on The benefits of responsible use of medicines: Setting policies for better and cost-effective health care, WHO describes 'responsible use of medicines' as the activities, capabilities and existing resources of health system stakeholders should be aligned in such a way to ensure patients receive the right medicines at right time, use them appropriately and get benefit from them.<sup>[2]</sup>

**The Problem of Inappropriate Use of Medicines**

The overuse, underuse or misuse of medicines can result in severe health issues in patients as well as the decimation of health care resources.<sup>[1]</sup> Inappropriate and ineffective use of drugs is commonly observed more commonly in developing countries.<sup>[3]</sup> The physicians are well aware of the condition as experienced from their day-to-day practice which can be attributed to various factors but the problem is undoubtedly a global one.<sup>4</sup> Few of the examples of inappropriate prescribing which are encountered in everyday practice are: medications prescribed when it was not indicated like antibacterial for viral sore throat. Likewise, antimicrobial in childhood viral diarrhea, drugs with unproven efficacy, e.g. loperamide in infective diarrhea. Appropriate medicine but inappropriate administration or route etc.<sup>[4]</sup>

The reasons for the irrational use of medicines are as follows:<sup>[5]</sup>

1. Easy accessibility of the prescription medicines in the market
2. Increased and easy availability of over the counter drugs
3. Patient pressuring physician to prescribe
4. Inadequate knowledge of the physicians or interns under training
5. Lack of skills or independent information

6. Increased burden and work of health personnel
7. Inappropriate drug promotion and advertisements
8. Counseling by non-healthcare personnel like friends, relatives, and persons to take medicine

### **Irrational Use of Medicines and Their Impact on The Healthcare**

Underprescribing leads to a reduction in the quality of drug therapy and increases morbidity and mortality along with wastage of resources and money. A study conducted by Wauters et al. has reported a strong association between under-prescribing and misuse with hospitalization and death among a cohort of community-dwelling elderly people aged 80–120 years.<sup>[6]</sup> Similarly, over-prescribing of a medication like antimicrobial for more than a prescribed period can give rise to resistance.<sup>[7]</sup> Incorrect prescribing in case of wrong diagnosis, wrong preparation or prescribing when not needed, also contributes to the morbidity.<sup>[8]</sup> Extravagant prescribing is when a more expensive medicine is prescribed in spite of having a less expensive alternate medication of comparable safety and efficacy which can affect the financial status of the patient.<sup>[9]</sup> Multiple prescribing or habit of polypharmacy is yet another aspect where multiple medicines are prescribed even though the therapy or benefit can be achieved with fewer medications.<sup>[10]</sup> The habit of polypharmacy apart from having implications on the financial status do also come with a risk of increased adverse drug reactions (ADRs).<sup>[11]</sup> ADRs at present is a matter of concern as ADRs are now considered as one of the chief causes of hospitalization which in turn proves to be a significant burden on the health and economic status of the patients.<sup>[12,13]</sup> WHO recommends monitoring of ADRs and a well-established pharmacovigilance system.<sup>[14]</sup>

The pharmacovigilance programme of India which is running across the country also stresses on rational and watchful use of medicine to ensure safe and effective use of medicines and avert the negative sequel of pharmacotherapy.<sup>[15,16]</sup>

### **Measures To Tackle The Irrational Use**

Drug utilization studies can be conducted in hospitals to identify problems associated with the use of specific medicines or the treatment of specific diseases. Use of established methods like Aggregate medicine consumption, Anatomical Therapeutic Classification (ATC)/Defined Daily Dose (DDD).<sup>[5]</sup> WHO drug use indicators are used to identify general prescribing and quality of care problems at primary health care facilities which are enlisted below.<sup>[17]</sup>

#### **A) Prescribing Indicators**

Average number of medicines prescribed per patient encounter

- % medicines prescribed by generic name
- % encounters with an antibiotic prescribed
- % encounters with an injection prescribed

% medicines prescribed from essential medicines list or formulary.

#### **B) Patient Care Indicators**

- Average consultation time
- Average dispensing time
- % medicines actually dispensed
- % medicines adequately labeled
- % patients with knowledge of correct doses

#### **C) Facility Indicators**

- Availability of essential medicines list or formulary to practitioners
- Availability of clinical guidelines
- % key medicines available

#### **D) Complementary Drug Use Indicators**

- Average medicine cost per encounter
- % prescriptions in accordance with clinical guidelines

WHO provides documents for Drugs and Therapeutics Committees and Guide to Good Prescribing which could serve as an excellent source of information regarding essential drugs and rational use.<sup>[18]</sup> Standard Treatment Guidelines (STGs) serve a good guide for prescribing and is of great help for the primary health care practitioners.<sup>[19,20]</sup>

The process of rational prescribing as discussed in the "Guide to Good Prescribing - A Practical Manual" by WHO describes the rational prescribing in the following six steps.<sup>[21]</sup>

1. Define the patient's problem
2. Specify the therapeutic objective for the patient
3. Deduce and Verify whether your P-treatment is suitable for the patient based on the criteria of safety, efficacy, tolerability, and cost.
4. Start the treatment with the right dose, right duration, and right route.
5. Provide necessary information to the patient along with required instructions and warnings for the expected ADRs.
6. Monitor the treatment if possible and call for a review.

We should work towards generalizing a culture of RUM by sensitizing the medical professional right from the beginning of their training. There should be regular workshops and training sessions for the interns, postgraduate resident, medical officer and nursing officers to inculcate the concept and essentiality of rational drug therapy.<sup>[22]</sup> The significance of concepts such as Essential Medicines, P-drugs, pharmacovigilance, pharmacoeconomics, antimicrobial stewardship and policies needs adequate attention and should be taught to the healthcare professionals during their course of learning which can make a crucial impact on the practice of RUD. The Drugs and Therapeutics Committee (DTC) should be established in each and

every hospital which can guide and monitor the drug use in the hospital. DTC basically evaluates the clinical use of medicines, develops policies for managing medicine use and administration, and manages the formulary system.<sup>[23]</sup> It conducts prescription audits, monitors ADRs, monitors drug dispensing practices, formulates antimicrobial policies and keeps a check on non-judicious use of antimicrobials. DTC needs the active participation of the clinicians, staffs, laboratory people and administration to function efficiently towards ensuring RUM and intervenes and corrects the prescribed therapy whenever required.<sup>[23]</sup>

WHO insists on rational use of medicines and recommends 12 key interventions to promote rational use of medicines.<sup>[24]</sup>

- A) Establishment of a multidisciplinary national body to coordinate policies on medicine use
- B) Use of international and established clinical guidelines
- C) Development and use of national essential medicines list for each country
- D) Establishment of drug and therapeutics committees in districts and hospitals
- E) The inclusion of problem-based pharmacotherapy training in undergraduate curriculum
- F) Continuing in-service medical education as a licensure requirement
- G) Drug therapy should be supervised, audited and feedback should be taken from the healthcare professionals
- H) Use of independent information on medicines and avoid the promotional literature for referencing
- I) Public education and awareness regarding medicines
- J) Avoidance of perverse financial incentives from the companies
- K) Use of appropriate and enforced regulation
- L) Sufficient government expenditure to ensure availability of medicines and staff

There are seven high-level strategic recommendations designed to create the policy framework for RUM which are enlisted below:<sup>[2,25]</sup>

1. Develop and mandate a list of essential medicine list at the national level to inform reimbursement decisions and ensure access to essential medicines.
2. Invest to ensure national medicines procurement and supply systems are efficient and reliable to support the responsible use of medicines.
3. Promote a shift in focus to early screening and accurate diagnosis to guide/inform medicines prescription and avoid overuse, underuse and misuse of medicines.
4. Facilitate the implementation of evidence-based treatment guidelines; where they exist, remove regulatory or administrative barriers and directly target all key stakeholders: prescribers, dispensers, and patients.
5. Promote initiatives that put patients at the center of treatment in order to maximize adherence to therapy.

6. Monitor medicine use, from purchase to health outcome, to evaluate the real-world efficacy of treatment and guide evidence-based policy-making.
7. Ensure sustained, top-down commitment of national authorities and promote active, bottom-up engagement of prescribers, patients and dispensers to the principles and policies fostering the responsible use of medicines.

## CONCLUSION

With the advancement in the therapeutics there is an increase in number of drugs as well as the cost of healthcare. Rational use of medicines is the need of the hour as a proper implementation can prove to be very helpful in reducing morbidity and mortality and improve associated with the usage of drug and improve quality of life of patients. It would also help in appropriate allocation of resources which would further help in better availability of essential drugs with genuine costs. It can also minimize the risk of ADRs and drug resistance. Drug utilization studies, pharmacovigilance, pharmacoepidemiology and pharmaco-economic studies should be carried out regularly which would provide relevant information that can be used by the government to formulate newer guidelines and policies of healthcare for betterment of public health. Hence, rational use of medicines if practiced properly can be a boon for the time to come.

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## REFERENCES

1. The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences. World Health Organization. Accessed on 12 Feb, 2019. from URL: [https://www.who.int/medicines/areas/rational\\_use/en/](https://www.who.int/medicines/areas/rational_use/en/).
2. The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences. WHO/EMP/MAR/2012.3. Chapter I – The case for better use of medicines. Accessed on 12 Feb 2019 from URL: [https://apps.who.int/iris/bitstream/handle/10665/75828/WHO\\_EMP\\_MAR\\_2012.3\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/75828/WHO_EMP_MAR_2012.3_eng.pdf?sequence=1).
3. Patel V, Vaidya R, Naik D, Borker P. Irrational drug use in India: a prescription survey from Goa. *Jour Postgrad Med*, 2005; 51: 9e12.
4. Chaturvedi VP, Mathur AG, Anand AC. Rational drug use - As common as common sense? *Med J Armed Forces India*. 2012; 68(3): 206-8.
5. Promoting Rational Use of Medicines: Core Components - WHO Policy Perspectives on Medicines, No. 005, September. World Health Organization. Accessed on 14 Feb 2019 from URL: <http://apps.who.int/medicinedocs/en/d/Jh3011e/3.html>, 2002.

6. Wauters M., Elseviers M., Vaes B., Degryse J., Dalleur O., Vander Stichele R., Christiaens T., Azermai M. Too many, too few, or too unsafe? Impact of inappropriate prescribing on mortality, and hospitalization in a cohort of community-dwelling oldest old. *Br. J. Clin. Pharmacol*, 2016; 82: 1382–1392.
7. Llor C., Bjerrum L. Antimicrobial resistance: Risk associated with antibiotic overuse and initiatives to reduce the problem. *Ther. Adv. Drug Saf*, 2014; 5: 229–241.
8. Ofori-Asenso R, Agyeman AA. Irrational Use of Medicines-A Summary of Key Concepts. *Pharmacy (Basel)*, 2016; 4(4): 35.
9. Godman B., Shrank W., Andersen M., Berg C., Bishop I., Burkhardt T., Garuoliene K., Herholz H., Joppi R., Kalaba M., et al. Comparing policies to enhance prescribing efficiency in Europe through increasing generic utilization: Changes seen and global implications. *Expert Rev. Pharmacoecon. Outcomes Res.*, 2010; 10: 707–722.
10. Session Guide Problems of Irrational Drug Use. Accessed on 14 Feb 2019 from URL: [http://archives.who.int/PRDUC2004/RDUCD/Session\\_Guides/problems\\_of\\_irrational\\_drug\\_use.htm](http://archives.who.int/PRDUC2004/RDUCD/Session_Guides/problems_of_irrational_drug_use.htm)
11. Kaur G. Polypharmacy: The past, present and the future. *J Adv Pharm Technol Res.*, 2013; 4(4): 224-5.
12. Patel KJ., et al. "Evaluation of the prevalence and economic burden of adverse drug reactions presenting to the medical emergency department of a tertiary referral centre: A prospective study". *BMC Clinical Pharmacology*, 2007; 7(8).
13. Dutta S, Chawla S and Banerjee S. Pharmacovigilance in India: A Need of the Hour. *Acta Scientific Medical Sciences*, 2018; 2(8): 98-100.
14. The Importance of Pharmacovigilance - Safety Monitoring of Medicinal Products. World Health Organization. Accessed on, 15 Feb 2019. from URL: <http://apps.who.int/medicinedocs/en/d/Js4893e/10.html>.
15. Kalaiselvan V, Thota P, Singh GN. Pharmacovigilance Programme of India: Recent developments and future perspectives. *Indian J Pharmacol*, 2016; 48: 624-628.
16. Dutta S. Pharmacovigilance in India: Evolution and Change in Scenario in India. *International Journal of Science and Research (IJSR)*, 2018; 7(10): 976 - 978. DOI: 10.21275/ART20192070.
17. WHO/INRUD drug use indicators for primary health-care facilities: Qualitative methods to investigate causes of problems of medicine use. WHO Essential Medicines and Health Products Information Portal. Accessed on 15 Feb 2019 from URL: <http://apps.who.int/medicinedocs/en/d/Js4882e/8.4.html>.
18. The Guide to good prescribing. WHO publications. Accessed on 15 Feb, 2019. from URL: <http://apps.who.int/medicinedocs/en/d/Jwhozip23e/5.html>.
19. Standard Treatment Guidelines (Speciality/Super Speciality wise). Clinical Establishments (Registration & Regulation) Act. Accessed on 15 Feb 2019 from URL: <http://clinicalestablishments.gov.in/En/1068-standard-treatment-guidelines.aspx>.
20. Standard Treatment Guidelines for Medical Officers. Government of Chhattisgarh Department of Health & Family Welfare. Accessed on 15 Feb, 2019. from URL: <http://apps.who.int/medicinedocs/documents/s23115en/s23115en.pdf>.
21. The process of rational prescribing. Guide to Good Prescribing - A Practical Manual. WHO. Accessed on 15 Feb, 2019. from URL: <http://apps.who.int/medicinedocs/en/d/Jwhozip23e/3.1.2.html>.
22. Singh T, Natu MV. Effecting attitudinal change towards rational drug use. *Indian Paediatrics*, 1995; 32: 43e46.
23. Drug and Therapeutics Committees - A Practical Guide. World Health Organization. Accessed on 16 Feb, 2019. from URL: <http://apps.who.int/medicinedocs/en/d/Js4882e/>.
24. Rational Use of Medicines: Summary of activities. Essential medicines and health products. World Health Organization. Accessed on 16 Feb. 2019. from URL: [https://www.who.int/medicines/areas/rational\\_use/en/](https://www.who.int/medicines/areas/rational_use/en/).
25. Technical Report prepared for the Ministers Summit on the benefits of responsible use of medicines: Setting policies for better and cost-effective health care. The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences. World Health Organization. Accessed on 16 Feb, 2019. from URL: [https://apps.who.int/iris/bitstream/handle/10665/75828/WHO\\_EMP\\_MAR\\_2012.3\\_eng.pdf;jsessionid=F0F6A208E986F8E4368D92344A571194?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/75828/WHO_EMP_MAR_2012.3_eng.pdf;jsessionid=F0F6A208E986F8E4368D92344A571194?sequence=1).