ANALYSIS OF KNOWLEDGE OF INTERNS REGARDING ESSENTIAL DRUGS CONCEPT AND RATIONAL USE OF DRUGS IN GENERAL PRACTICE AND IMPACT OF ORIENTATION- A QUESTIONNAIRE-BASED STUDY

Siddhi P. Surlakar[1], Padmanabh V. Rataboli[2]

[1]Postgraduate Student, Department of Pharmacology, Goa Medical College, Goa.
[2]Director, Professor, Department of Pharmacology, Goa Medical College, Goa.

ABSTRACT

BACKGROUND

Internship is a period of medical apprenticeship under the supervision of a senior consultant. The intern in addition to learning clinical skills, is expected to demonstrate a good clinical judgement and prescribe rationally. Thus, interns are the junior most doctors in a tertiary care hospital.

Objective- To analyse the knowledge, attitude and practice of rational use of medicines and the impact of orientation in interns in a tertiary care teaching hospital.

MATERIALS AND METHODS

This was a questionnaire-based study which included 100 interns of a tertiary care teaching hospital wherein interns were made to answer practical questions before and after the orientation lecture.

RESULTS

All students individually scored higher in the post-test as compared to pre-test. The mean score of the batch was 22 in the pre-test as compared to 34 in the post-test. Student's T-Test was applied for analysis of data. The result was statistically significant. Seventy six percent respondents were aware about the term Essential Drugs at pre-test and this increased to 88% at post-test. Only 13% interns knew about P-drugs at pre-test. After orientation lecture, 94% wrote the answer correctly.

CONCLUSION

The findings of present study showed that a few interns had knowledge about rational use of drugs, and a great deal of training is required to bridge the gap between theoretical MBBS Course and actual clinical practice.

KEYWORDS

Essential Medicines, P-Drugs, Rational Use of Drugs.

HOW TO CITE THIS ARTICLE: Surlakar SP, Rataboli PV. Analysis of knowledge of interns regarding essential drugs concept and rational use of drugs in general practice and impact of orientation- A questionnaire-based study. Journal of Evolution of Research in Medical Pharmacology 2017; Vol. 3, Issue 1, Jan-June 2017; Page: 0-0; Page:5-9.

BACKGROUND

Pharmacology is one of the most important subjects in medical curriculum and can be considered as the backbone of Clinical Medicine.(1) Prescribing the right therapy is the essential duty of doctors and hence, adequate knowledge about the drug's efficacy, safety, cost, and convenience is of utmost importance.(2) Proper training in Pharmacology can enrich medical students' knowledge and skill about prescribing and their utility in various diseases.(3)

According to World Health Organization (WHO), rational use of medicine requires that 'patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and the lowest cost to them and their community'.(4) Essential medicines, as defined by the WHO are the medicines that "satisfy the priority health care needs of the population".(5) These are the medications to which people should have access at all times in sufficient amounts.

Financial or Other, Competing Interest: None.
Submission 08-06-2017, Peer Review 21-06-2017,
Acceptance 27-06-2017, Published 30-07-2017.
Corresponding Author:
Siddhi P. Surlakar,
H. No. 124, Jagannath Niwas,
Borda, Margao-403601, Goa.
E-mail: siddhi19021990@gmail.com

There are worldwide evidences of poor prescribing due to errors and polypharmacy. Inappropriate or irrational prescribing leads to serious health risks and financial burden to the patient.

To overcome these difficulties, WHO has published a guide to good prescribing which includes the concept of P-drug to boost the cause of rational use of drugs (RUD). The idea was to make physicians familiar with some personal drugs chosen from National List of Essential Medicines based on safety, efficacy, suitability and cost.(6) They are physicians' priority choices for given indications. The P-drug concept also includes the dosage form, dosage schedule and duration of treatment. P-drugs enable you to avoid repeated searches for a good drug in daily practice. Thus, prescribing is a challenging task requiring knowledge of essential medicine, rational usage and P-drugs.

Internship is a period of medical apprenticeship under the supervision of a senior consultant. The intern in addition to learning clinical skills, is expected to demonstrate a good clinical judgement and prescribe rationally. Thus, interns are the junior most doctors in a tertiary care hospital.(7)

Unsuccessful prescribing can take a number of forms: underprescribing, overprescribing, inappropriate prescribing, irrational prescribing and prescribing errors.(8)

Most often interns are only expected to copy the

prescribing behaviour of their senior consultants, or refer to existing standard treatment guidelines, without explanation as to why certain treatments are chosen.[9] Though majority of interns recognise the importance of RUD, most of them have not been able to apply regularly this knowledge in their daily medical practice.[8] In addition, this is the time when they get in touch with medical representatives who try to misguide them and change their prescribing habits using various techniques of marketing and at times by offering free samples and gifts. It is thus logical that we try our best to promote RUD at this period.

Errors are more likely to occur with interns and junior doctors[10,11,12] but are still prevalent in other senior categories of doctors.[10,13,14]

Educational interventions like orientation lectures, seminars, workshops and training sessions are known to improve the awareness about the rational use of medicines among the prescribers. In India, essential medicines and P-drug concept is not routinely included in detail in undergraduate curriculum. Problem-based pharmacotherapy is also generally lacking in the curriculum. Hence, the present study will help us to understand the level of knowledge of interns at the beginning of their internship and to make appropriate changes in the teaching methodology with more stress on practical aspects of pharmacology.[15]

A study[16] has reported that interns lack confidence in prescribing, with the majority of them feeling that undergraduate education in clinical pharmacology and therapeutics had not prepared them adequately for prescribing duties.

The objectives of this study were thus to evaluate the knowledge of Essential Drugs Concept and rational use of medicine in general practice among interns at the beginning of their compulsory rotatory internship, and to analyse the impact of orientation on their knowledge.

MATERIALS AND METHODS

A new batch of 100 interns at Goa Medical College, a tertiary care hospital, was considered for our study. The interns who were willing to voluntarily participate in the study were given the questionnaire (appendix 1) to fill anonymously. Confidentiality of the information tendered was assured to the participants. The study was approved by the Institutional Ethics Committee of Goa Medical College.

The questionnaire assessed the interns' knowledge on regular use of drugs in clinical practice including their right choice, the correct dose, prescribing in relation to meals, duration of therapy, rationality of fixed dose combinations (FDCs) and contraindications in pregnancy.

The completed questionnaires were collected from all the interns after 15 minutes. This was considered as the pre-test.

This was followed by an Orientation Lecture on 'Essential Drugs Concept and Rational Use of Drugs'. After the lecture, the students were given the same questionnaires again and were collected after 15 minutes. This was considered as the post-test.

The pre as well as post-test answers were then analysed and scored. A total score of 50 was assigned to the questionnaires. The pre and post-test questionnaires were compared using unpaired Student's t-test for statistical significance of p value <0.05. The data for individual questions was expressed as percentages. Any change in score in pre and post–test was observed.

RESULTS

A batch of 100 interns at Goa Medical College answered the pre and post-test questionnaires on various aspects of drugs. All students individually scored higher in the post-test as compared to pre-test in all the questions (table 1). The total mean score of the batch was 22 ± 4.78 in the pre-test as compared to 34 ± 4.41 in the post-test. Unpaired Student's t-test was applied for analysis of data. The result was statistically significant ($p<0.001$) and there was a significant improvement in the total score after the educational intervention on 'Essential Drugs Concept and Rational use of Drugs'.

Seventy six percent respondents were aware about the term Essential Drugs at pre-test and this increased to 88% at post-test. Only 13% interns knew about P-drugs at pre-test. After orientation lecture, 94% wrote the answer correctly.

No intern could answer the number of drugs listed in the National List of Essential Medicines. This number increased to 56% post-test.

23% and 78% answered correctly more than 7 out of 10 questions regarding the timing of drugs in relation to food, in the pre-test and post-test respectively. Only 24% interns could answer question on duration of therapy correct before the lecture as compared to 93% after.

Only 22 interns could recognise 3 out of 4 drugs contraindicated in pregnancy in the pre-test as compared to 72 interns in the post-test. Only 10% interns could tell the correct dose of at least 4 out of 5 drugs in the pre-test. This number increased only to 28 in the post-test.

Only 27 interns could select the correct drug of choice in 7 or more conditions out of 10 in the pre-test as compared to 52 in the post-test.

Table 1 shows the questions that were put forth to the interns and their response percentage before and after the Orientation Lecture.

DISCUSSION

One hundred interns participated in this study approved by Institutional Ethics Committee. This was a questionnaire-based study which was conducted at Goa Medical College, a tertiary care teaching hospital. Self-developed, pre-validated questionnaires consisting of 50 items were given to all the interns to fill up after explaining the nature and purpose of the study.

In our study, the knowledge of interns regarding rational use of drugs and essential medicines concept has shown a marked increase after subjecting them to an educational intervention in form of an orientation lecture, which is in line with the study results of the systematic review done by Kamrudeen et al.[17] This study is unique, as we have assessed the knowledge of the interns on rational use of drugs, both before and after the educational intervention and training on rational prescribing.

A medical student first enters medical practice during internship. Internship is the period where students after passing final MBBS examination prescribe drugs and offer patient care under the guidance of senior teachers. It also marks the beginning of the young doctors' experience with

unsupervised prescribing, which is both technically challenging and unnerving.

This is the period when they should develop good habit of prescribing right drugs in right doses. Rational prescription writing is a skill which should be mastered at the earliest. At the start of clinical training most interns find that they don't have a very clear idea of how to prescribe a drug for their patients or what information they need to provide. Secondly, as the drug market in India, is rapidly booming, interns are often confused to select the right drug from the innumerable therapeutic choices available.

Their attitude toward good prescribing and rational drug use is of utmost importance as they constitute the future generation of doctors. This study was planned to evaluate and compare knowledge, attitude and practice of rational use of medicines among interns in a tertiary care teaching hospital. It has taken into consideration existing knowledge and understanding of interns about various issues concerned with RUD and would guide the teachers in training the medical students better in near future. Hence, assessing knowledge of RUD among them in such set-up would be immensely helpful in promoting RUD and improving patient care.

In the present study, unfortunately, a very few interns were aware about most of the issues concerned with RUD addressed in the questionnaire which does not seem to be a positive finding. Being future prescribers, all of them need to have correct knowledge about rational drug prescribing.

In our study, we have observed that the interns were weak in deciding the right choice of drugs, writing the correct dose, selecting the safe option in pregnancy as well as knowing the rationality of prescribing despite completing 5-½ years of medical training.

In a study by Dakhale et al,[18] higher percentages of respondents were aware about essential medicines, but level of understanding related to P-drug concept was much below par.

In our study, no intern could tell the exact number of drugs in NLEM. In the study by Dakhale et al,[18] only 4% of the respondents knew the exact number of drugs in the NLEM and none were able to quantify the fixed dose combination in NLEM. The findings are similar to a previous study conducted by Mahajan et al.[19]

In a study by Dudhe et al, 84% residents opined that knowledge of RUD was greatly essential for medical practice. Half of the participants (52%) believed that, they sometimes felt conflicted by occurrence of huge variations between their theoretical knowledge of RUD and actual clinical practice, while 65% were unaware of the concept of P-drug.[20]

Naik et al[21] rightly feel that due to the wide gap between the second MBBS and internship and the lack of a refresher course, most of the knowledge about rational pharmacotherapy is lost in the transition. In many medical curricula, teaching in the clinical disciplines is focused on symptoms and diagnosis, and little or no time is given for learning the principles of drug treatment.[22] These pitfalls in undergraduate teaching may cause interns to be underprepared in the process of rational prescribing.

The WHO six steps of rational prescribing are an important guide to prepare young doctors in the approach of rational prescribing.

The Six Steps are as follows-

Step 1- Define the patient's problem.
Step 2- Specify the therapeutic objective.
Step 3- Verifying the suitability of P-drug.
Step 4- Write the prescription.
Step 5- Give instructions and warnings to the patient.
Step 6- Monitor/stop the treatment.

Medication errors are more likely to happen when new doctors arrive to work in hospitals. Studies have shown junior doctors to be responsible for a significant number of prescribing errors.[12,23,24] In a study by Volvoikar and Rataboli,[13] a total of 1015 prescriptions were analysed over a one-year period, out of which 415 (40.88%) showed different types of prescription errors by experienced doctors. This clearly underlines the need to educate the most junior doctors in building a good habit of rational prescribing.

Naik et al[21] reported that a large number of interns opined that UG medical curriculum was inadequate to train them to prescribe rationally. Each of them experienced problems while prescribing during internship, and the commonly reported difficulties were drug dosage calculation based on weight and age. With regard to prescribing skills, interns felt less confident in accessing drug-related information, dosage calculation, and writing prescriptions. Most interns (65/73) were unaware of the ''six steps of rational prescribing''.

In our study, performance of interns in the post-test was highly significant thus underlining the importance of an intervention. An earlier study by Saravanan et al[25] also clearly shows that early sensitisation of physicians about rational prescription writing during internship phase by means of educational intervention/training program can reduce the number of prescription errors.

Some of the critical deficiencies in prescribing during internship have been assessed through this study. Interns largely feel unprepared to handle prescribing, and therefore, undergraduate teaching in rational prescribing needs to be fortified. Key grey areas such as drug dosage, selecting right drug in a given situation, and proper use of drugs in pregnancy should be emphasised on during their training. A refresher course in rational prescribing could be implemented with a focus on the above-mentioned areas, at the start of the internship. This would enable interns to be better prepared to handle patients during internship and beyond. Moreover, repeated assessments of interns in clinical pharmacology should be done on a semi-annual/quarterly basis. The internship training could then be suitably modified to tackle specific difficulties encountered by them.

CONCLUSION

Findings of the present study suggested a poor implication of theoretical knowledge of drugs, which is an alarming sign. Post-test significant rise in scores suggests that proper practical discussion on clinical pharmacological applications can go a long way in improving young, fresh doctors' rationality in prescribing. It is noteworthy to stress that regular monitoring should be done to check for the implementation of rational principles in daily clinical practice and not just for the sake of a study. Such studies and orientation courses should be done at all health care facility centres, so that minimum possible drugs can be used to treat

diseases effectively, thus decreasing economic burden and at the same time increasing quality of health care.

The study has brought to the forefront some important issues related to rational prescribing among interns. Findings of this study emphasise the importance of teaching interns about the practical tips in prescribing such as right dosage, right choice of drugs, contraindications in pregnancy and other drug-related information. Strengthening UG training in rational prescribing practice are the other key points from this study. A clinical pharmacology course aimed at practical prescribing skills could be devised for students at the time of their entry into internship. This will enable interns to be better equipped for rational practice during internship and their successful clinical careers beyond.

Question	Pre-test Percentage	Post-test Percentage	Re-marks
1) What do you understand by the term 'Essential Drugs'?	76	88	-
2) How many drugs are listed in the most recent 'National list of essential medicines'?	0	56	-
3) What are P-drugs?	13	94	-
4) When are the following drugs prescribed with relation to food?	23	78	7 or >7 correct answers
5) What is the minimum duration of therapy for the following groups of drugs?	24	93	-
6) Which of the following FDCs are rational? (put a tick mark √)	98	98	-
7) Which of the following are contraindicated in pregnancy? put (X)	22	72	3 or 4 correct answers
8) Say 'true' or 'false' (T or F)	15	84	6 or 7 correct answers
9) What is the dose of the following drugs?	10	28	4 or 5 correct doses written
10) Which drugs will you select for your patient in the following situations?	27	52	7 or >7 correct drugs written

Questionnaire used in the Study

Appendix 1

1. What do you understand by the term 'Essential Drugs'?
2. How many drugs are listed in the most recent 'National list of essential medicines'?
3. What are P- drugs?
4. When are the following drugs prescribed with relation to food?
   a) Glimepiride, b) Amoxicillin, c) Cefpodoxime, d) Azithromycin, e) Voglibose, f) Rabeprazole, g) Paracetamol, h) Iron salts, i) Metformin, j)Thyroxine.
5. What is the minimum duration of therapy for the following groups of drugs?
   a) Antibiotics, b) Antidepressants, c) Antidiabetics.
6. Which of the following FDCs are rational? (Put a tick mark √)
   a) Amoxicillin + clavulanic acid, b) Paracetamol + Diclofenac + Serratiopeptidase, c) Ranitidine + Dicyclomine, d) Cefixime + Azithromycin, e) Ciprofloxacin + Tinidazole.
7. Which of the following are contraindicated in pregnancy? put (X)
   a) Amoxicillin, b) Cefpodoxime, c) Doxycycline, d) Warfarin, e) Insulin, f) Telmisartan, g) Atorvastatin, h) Prednisolone.
8. Say 'true' or 'false' (T or F)
   a. Sulphonamides are safe in children less than one year of age.
   b. Betahistine can be combined with cinnarizine for vertigo.
   c. Calcium channel blocker + Diuretics is good option for hypertension.
   d. Sustained release tablets cannot be halved.
   e. NSAIDS should always be combined with antacids or PPIs.
   f. Albendazole should be given after dinner for helminthiasis.
   g. Enteric-coated aspirin is given 45 min. after meals.
9. What is the dose of the following drugs?
   a) Azithromycin for upper respiratory infection, b) Ondansetron for vomiting, c) Telmisartan for hypertension, d) Metronidazole for amoebiasis, e) Paracetamol for fever.
10. Which drugs will you select for your patient in the following situations?
    a) Patient having difficulty in falling asleep.
    b) Urinary tract infection in a pregnant female.
    c) Gastroenteritis in a 53-year-old male.
    d) Severe inflammation of big toe in a 29-year-old male.
    e) Allergic rhinitis in an 18-year-old boy.
    f) Cellulitis of leg in a 26-year-old female.
    g) BP 160/110 in an asthmatic patient.
    h) Normal range of FBSL but consistently high PPBSL.

i) Familial combined hypercholesterolaemia (LDL 168 mg/dL, TG 210 mg/dL) in a 40-year-old businessman.
j) Postponement of menstruation in a 24-year-old female who expects menses 5 days later.

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