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KNOWLEDGE, ATTITUDES AND PRACTICE SURVEY ON RATIONAL USE OF ANTIBIOTICS AMONG PRESCRIBERS IN A TERTIARY CARE HOSPITAL IN SOLAPUR

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Abstract: **Objective:** The present study seeks to assess the knowledge and insight of resident physicians in a tertiary care hospital in Solapur regarding the usage of antibiotics, with emphasis on whether they perceive any misuse of these drugs, possible reasons behind such misuse and feasible remedial measures. **Materials and Methods:** A prospective, observational, cross sectional study was done over a 4-month period among the resident physicians from core clinical disciplines. All the participants enrolled in this study had to fill up a structured validated multiple response type questionnaire which was used to assess the knowledge, attitude, practice and perception among physicians towards a rational use of antibiotics. Respondents were free to leave out questions they did not wish to answer. The confidentiality of respondents and their choices were ensured. **Results:** The response rate to the questionnaire was 72.2% (52/72). 52% were first year and 48% were second year post-graduate residents. Though all the participants were aware about rational drug use, only 60% correctly answered the definition. All participants were aware of the existence of Essential Drug List, but only 73% had their own copy and 90.4% agreed to using the drugs included therein routinely. 69.23% participants were aware of the National policy for containment of Antimicrobial resistance. A large number of participants (77%) were of the opinion that antibiotics were generally overused in the country and 44.23% believed it is difficult to select the correct antibiotic. Most of them (88.46%) disagreed that they themselves overprescribe antibiotics and 11.5% were neutral in this matter. All participants agreed that antibiotic resistance is a problem in the country and that oral antibiotics are the most misused but only 51.9% agreed it to be a problem in their daily practice. Most common conditions in which the responders think antibiotics are most misused are cough and cold (84.61%), diarrhoea (77%), urinary symptoms (73.1%) and fever (67.31%). **Conclusions:** The participants of our study agreed that antibiotics were being overused and had agreeable knowledge about the rational use of antibiotics. Most of them had provided counselling on proper use of antibiotics to their patients and considered the overall issues of resistance while prescribing.

Keywords: Clinicians, rational antibiotic use, antibiotic resistance, KAP survey

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INTRODUCTION

Antibiotics are among the most frequently prescribed drugs worldwide.^{1,2} The overuse and/or misuse of antibiotics can lead to significant consequences, like increased costs, bacterial resistance, therapeutic failures, drug toxicities and drug interactions.¹ Emergence of antibiotic-resistant microorganisms due to excessive and indiscriminate use of these drugs is a serious issue which is plaguing healthcare delivery throughout the world, preferentially affecting low and middle income countries.^{3,4,5,6} Overcrowding, poor sanitation and a warm-humid climate in these countries, results in the rapid spread of resistant bacteria.⁷

The prevalence of the use of antimicrobial agents varies from 24 to 67% in India,^{8,9} and about 64% of the total antibiotics which are prescribed are either not indicated or are prescribed in incorrect dosages or are inappropriately prescribed.^{8,10} They account for more than 50% of the drugs which are sold¹⁰, which puts an excessive strain on the limited health care budget.⁸ According to the results of various surveillance studies which were done, the percentage of irrational antibiotics which was reported was 40-60%.¹¹ Antibiotic resistance develops with the inappropriate use, which includes the wrong indication, mode of use, and the poor adherence of the prescribed drugs.⁸ Such infection from resistant microorganisms may be associated with increased mortality and morbidity.^{12,13} Reduction in antimicrobial use is a cornerstone in the containment of antimicrobial resistance and can be addressed through changes in prescribing behaviour. Available literature highlights the necessity of rationalization of antimicrobial therapy in developing countries.^{4,14,15}

The concept of rational drug use is new in the developing countries¹⁶ and it refers to prescription of the right drug to the right patient, in the right dose, at right time intervals and for the right duration.¹⁷ Therefore, knowledge about the driving forces behind antimicrobial prescription is needed, and such information can be obtained by means of so-called KAP-surveys (knowledge, attitudes and practice surveys). The present study seeks to assess the knowledge and insight of clinicians in a tertiary care hospital in Solapur regarding the usage of antibiotics, with emphasis on whether they perceive any misuse of these drugs, possible reasons behind such misuse and feasible remedial measures.

METHODS

A prospective, observational, cross sectional study was done over a 4-month period among the resident physicians in Shri Chhatrapati Shivaji Maharaj Sarvopachar Rugnalaya, Solapur. Resident physicians of first and second years from the departments of general medicine, paediatric medicine, obstetrics and gynaecology, general surgery, orthopaedics, ophthalmology and otorhinolaryngology were included in the study. Those resident physicians who do not

prescribe antibiotics routinely like those from psychiatry, radiology, anaesthesiology and non-clinical disciplines were excluded.

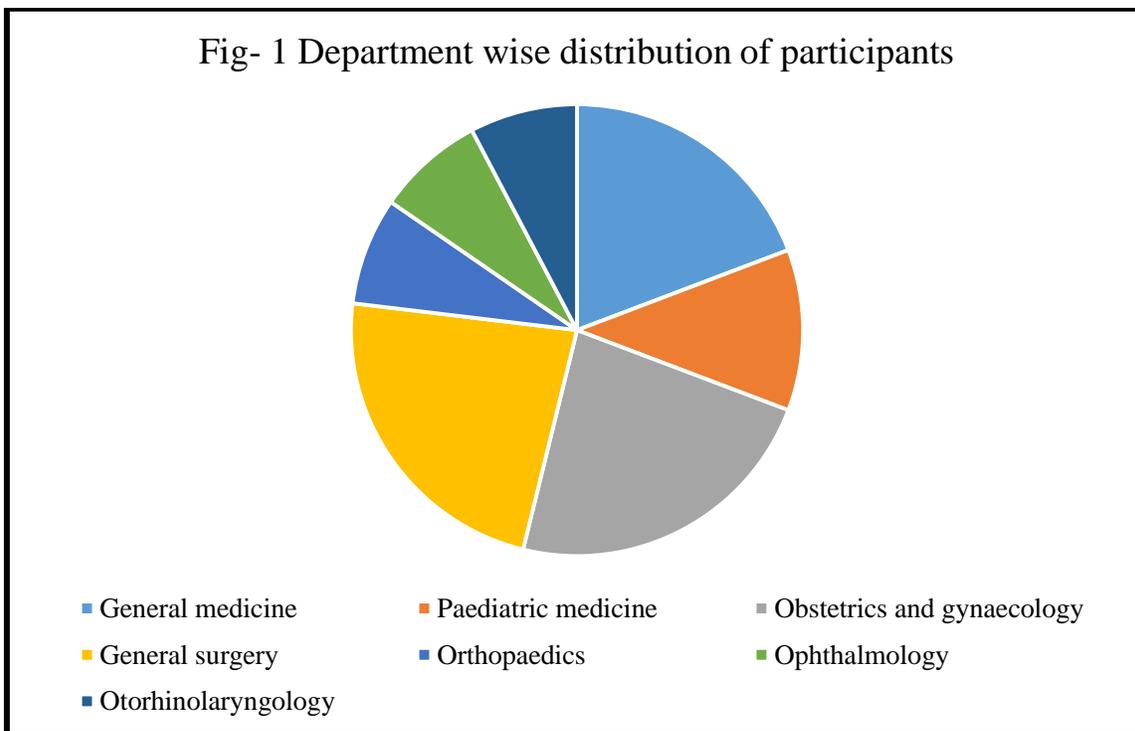
All the participants enrolled in this study had to fill up a structured validated multiple response type questionnaire which was used to assess the knowledge, attitude, practice and perception among resident physicians towards a rational use of antibiotics. The questionnaire content was based on published studies and modified to suit the responding population.^{14, 18, 19} Respondents were free to leave out questions they did not wish to answer.

The questionnaire consisted of 50 questions which were used to assess the knowledge, attitude, perception and practice of the participants. The first 4 questions addressed the professional profile of the participants and frequency of antimicrobial prescription. 19 questions were used to assess knowledge; the first question consisted of the knowledge on the definition of rational drug use, 2 were Yes/No type questions, 6 were statements measured on a 5-point Likert scale and 10 questions were based on the knowledge of antibiotic use in clinical settings. To assess attitude, 12 questions were used; one on the preference of generic or branded antibiotics, 3 Yes/No type questions and 8 statements measured on a 5-point Likert scale. To assess practice and perception, 8 and 4 statements respectively were used and measured on a 5-point Likert scale. 3 additional questions addressed the perceptions regarding the most misused antibiotics and the disease conditions they are associated with. Questions using a 5-point Likert scale included answers ranging from “strongly agree” to “strongly disagree”, from “very useful” to “not useful at all”, from “always” to “never” and from “0 times” to “>10 times”.

RESULTS

A total of 52/72 resident physicians filled in the questionnaire (response rate 72.2%). 52% were first year and 48% were second year post-graduate residents. Respondents were from departments of general medicine (19.23%), paediatric medicine (11.54%), obstetrics and gynaecology (23.07%), general surgery (23.07%), orthopaedics (7.7%), ophthalmology (7.7%), and otorhinolaryngology (7.7%). (Fig - 1).

Fig- 1 Department wise distribution of participants



All the participants were aware about rational drug use, but only 60% correctly answered the definition. All participants were aware of the existence of Essential Drug List, but only 73% had their own copy and 90.4% agreed to using the drugs included therein routinely. 69.23% participants were aware of the National policy for containment of Antimicrobial resistance.

Though frequency of prescribing antimicrobials vary in different physicians, 80.77% told that they review their decision to prescribe antimicrobials from a senior colleague while in the emergency room, outpatient clinic or wards and 44.23% of them had told that senior colleagues often recommend them a different antimicrobial. 15.38% believed the interactions of prescribers in general with pharmaceutical representatives influenced their antibiotic prescriptions, 11.54% agreed that they were themselves influenced sometimes while 84.62% were neutral on this subject. 57.7% felt very confident about themselves regarding the optimal use of antibiotics and 42.3% felt somewhat confident. 67.3% reported that in the last year, they had received teaching on antibiotics as part of the academic activities in respective departments.

While asking them about their sources of information for antimicrobial use, 86.54% agreed that information from senior colleagues and 57.7% agreed that information from colleagues of the same rank to be helpful. 80.8% also find internet sources very useful. (Table 1) 32.7% were not familiar with Sanford Antimicrobial guide and 90.4% felt that there are enough sources of

information about antibiotics. 71.15% preferred to prescribe generic antibiotics while 28.85% preferred both generic and branded ones.

Table 1: What doctors felt about important source of information about antibiotics.

Sources	Number of doctors agreed as useful (out of 52)	Percentage
Information from senior colleagues	45	86.5%
Information from colleagues of same rank	30	57.7%
Internet	42	80.8%
Antimicrobial guides	27	52%
Feels that source of information is adequate	47	90.4%

A large number of participants (77%) were of the opinion that antibiotics were generally overused in the country and 44.23% believed it is difficult to select the correct antibiotic. Most of the doctors (88.46%) disagreed that they themselves overprescribe antibiotics and 11.5% were neutral in this matter. All participants agreed that antibiotic resistance is a problem in the country and that oral antibiotics are the most misused but only 51.9% agreed it to be a problem in their daily practice. 75% of responders agreed that antibiotics are overused in the community in Solapur. 7.7% of doctors told that unnecessary antibiotic use do not cause damage to patients. About 78.85% ensured their patients had completed the entire course of the antibiotic therapy. 94.2% participants agreed that they had provided counselling while prescribing medications to their patients and 69.23% said that they had taken special interest in advising their patients about the proper use of antibiotics. 86.54% considered the overall issues of resistance while they prescribed antibiotics for individual patients.

55.77% agreed and 19.23% strongly agreed that they had a sound knowledge about the new antibiotics and their usage, even though only 42.3% had a formal education on the newer antibiotics last year. 75% agreed that they have a sound knowledge regarding prescription of the antibiotics rationally. 82.7% positively responded that they had a sound knowledge about the laboratory studies which were related to infections and that they were comfortable in interpreting the culture and sensitivity results. All participants agreed that better use of antibiotics, antibiotic guidelines and antibiotic committee could help in decreasing antibiotic resistance and provide better clinical care. Most of them (80.8%) would like the organization of

educational programmes on antibiotics. Most common conditions in which the responders think antibiotics are most misused are cough and cold (84.61%), diarrhoea (77%), urinary symptoms (73.1%) and fever (67.31%). (Table 2)

Table 2: Conditions in which antibiotics are perceived to be most misused

Conditions	Number of responses (out of 52)	Percentage
Cough and cold	44	84.61%
Diarrhoea	40	77%
Urinary symptoms	38	73.1%
Fever	35	67.31%

While answering for different case scenario, response varied. In a simple diarrhoea of a 40 year old afebrile woman and a case of upper respiratory tract infection in a 32 year old, the vast majority of participants agreed that there was no need to start an antibiotic (90.4% and 78.8% respectively). The knowledge about the need to reduce the dose of antibiotic in a patient with severe renal impairment was assessed by presenting two sepsis patients with impaired kidney function in which one received clindamycin and the other received ceftriaxone and gentamicin. 59.62% correctly identified that antibiotic should be reduced in the latter case while 23% considered the need for antibiotic reduction in both. Furthermore, nearly all participants (98%) correctly replied that metronidazole has activity against anaerobes and 40.4% participants correctly answered that methicillin resistant *Staphylococcus aureus* (MRSA) is only susceptible to fifth generation cephalosporins. The majority (86.53%) of participants agreed that amoxicillin is safe during pregnancy. 84.61% correctly answered that ampicillin should not be used to treat *Klebsiella* infection and 61.54% correctly replied that aztreonam can be safely used in a patient with a history of allergy to penicillin. 52% responders knew that amoxicillin is replaced by metronidazole in a penicillin-allergic patient for eradication of *H. Pylori* infection. Only 15.4% of participants were aware that colistin is the last antibiotic that can work on resistant *Klebsiella* but against which resistant isolates are recently found.

DISCUSSION

Our study was done to assess the knowledge, attitude, perception and practice among the practitioners towards a rational use of antibiotics. The results showed that most of the participants had sound knowledge about rational use of antibiotics and an attitude to prescribe

drugs as per the essential drug list. Moreover, in most cases, they had ensured proper use of antibiotics by their patients through counselling. They also perceived that antibiotics were being generally overused in the community and that rational drug prescribing plays an important role in reducing the antibiotic resistance.

The results of our study were similar to those of a study which was conducted by, Remesh et al¹⁴, Chatterjee et al¹⁸ and Ghosh et al²⁰ which had shown that participants perceive that antibiotics were being overused and try to prescribe drugs rationally as per the essential drug list.

Remesh et al¹⁴ conducted a questionnaire-based study on clinicians in a tertiary care hospital in India to assess their knowledge, attitude, and perception regarding rational antibiotic usage. The participants had a perception similar to that of the respondents in the present study that the existence of an essential drug list along with rational prescribing based on culture-sensitivity were of utmost importance to minimise antibiotic overuse. In this study, 49% participants agreed that they had their own copy of the Essential Medicines List whereas in our study, 73% had their own copy.

Similar results were also obtained in the study by Chatterjee et al¹⁸ in which clinicians acknowledged that the misuse of antibiotics is an important problem in their hospitals. Cough and cold (78.5%), fever (65.4%), and diarrhoea (62.3%) were perceived to be the commonest conditions of antibiotic misuse. About half (50.76%) felt that oral preparations were more misused compared to injectable or topical ones.

In the study conducted by Ghosh et al²⁰, all doctors agreed that antimicrobial resistance is a problem in India and also in their daily practice. It was reported that only 35.94% felt very confident about themselves regarding the optimal use of antibiotics and a majority of them reviewed their decision from a senior colleague regarding appropriate choice of antimicrobials while in the emergency room, outpatient department or wards. A slightly higher percentage of participants ie 57.7% in our study claimed that they were very confident and 80.77% agreed that they routinely review their decision from a senior colleague.

The present study also revealed information about the sources of information used by resident doctors for antimicrobial use. Information from the seniors and colleagues were ranked as the most useful source followed by Internet sources. 52% percentage had told about importance of antimicrobial guides as the important sources.

Another study which was done in Pakistan by Amin et al¹⁶ to evaluate the prescribers approach towards a rational drug practice, concluded that an accurate prescribing decision, an

appropriate treatment, and a rational use of drugs are the major needs of the day, to ensure a safe medication practice.

Continued medical educations and seminars, workshops on antimicrobial prescription are required for updating the knowledge of doctors and that would ultimately prevent inappropriate use of antimicrobials and emergence of resistance against them. Participation in such kind of educational activities must be emphasized to restrict inappropriate antimicrobial use.²⁰

One of the main limitations of this kind of KAP surveys is that participants may tend to give socially desirable answers rather than expressing their true opinions. Hence, these answers of the questionnaires may not reflect what the doctors usually practice in real life. In order to minimize this potential bias, anonymous participation was ensured and the case-based questions about antimicrobials prescription were presented at the end of the survey.

CONCLUSION

To conclude, the participants of our study had agreeable knowledge about the rational use of antibiotics and an attitude to prescribe drugs as per the essential drug list, they had ensured a proper use of antibiotics by their patients, and they had a perception that antibiotics were being overused and that antibiotic resistance had an important role in the rational drug prescriptions. Most of them had provided counselling while prescribing medications to their patients and considered the overall issues of resistance while they prescribed antibiotics for individual patients.

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DECLARATIONS

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Conflict of interest: None

Ethical approval: The study was approved by the Institutional Ethics Committee

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