Section: Pharmacology

Original Research Article

KNOWLEDGE, ATTITUDE AND PRACTICE OF HEALTHCARE PHYSICIANS ON ANTIMICROBIAL STEWARDSHIP PROGRAM IN A TERTIARY CARE TEACHING HOSPITAL IN TELANGANA

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ABSTRACT

Background: Antimicrobial resistance (AMR) has emerged as a global health problem, which is paralleled by irrational use of antimicrobials. Antimicrobial stewardship program (AMSP) was proposed by ICMR to curb this problem. **Aim and Objectives**: The present study was done to assess the knowledge of the physicians regarding AMSP, and to know about their attitude and prescribing practices towards antimicrobial usage. **Materials and Methods:** The present study was done for a period of 2 months (October 2023 to November 2023) using a validated and peer reviewed questionnaire. This questionnaire had sets of questions to assess knowledge, attitude and practice (KAP) domains of the physicians about AMSP. The responses were graded using 5-point Likert scale. Descriptive analysis was done, and results were expressed in percentages. **Results** There were 42 physicians belonging to various disciplines, who responded to the questionnaire study. Many physicians (71.4%) were aware of AMSP and about division of antimicrobials into access, watch and reserve groups (AWARE classification). 76.2% were adherent to the standard treatment guidelines developed by ICMR regarding the usage of antimicrobials. As many as 81% of physicians felt a need for continuous education programs to improve the knowledge of prescribers on appropriate antimicrobial usage. 90.5% agreed that the need for clinical pharmacist/pharmacologist to do regular audits to improve antimicrobial usage. **Summary and Conclusion:** There is an increasing need for practicing physicians to improve their adherence to guidelines of AMSP, which helps to prevent antimicrobial resistance.

INTRODUCTION

Antimicrobial resistance has become a global threat, due to poor prescription practices of antimicrobials by health care physicians. This is largely due to lack of proper awareness regarding rational usage of antimicrobials. Self-medication practices of antimicrobials and over the counter availability of antimicrobials also largely contribute to this existing problem of antimicrobial resistance (AMR).[1] Poor disposal practices of antimicrobials by patients and Hospital can cause harm to human, animal and environmental health. With only a few antimicrobials in the pipeline of drug development, a very cautious and restricted of antimicrobials is mandatory.

In India, the present scenario of antimicrobial resistance is quite alarming as there are reports of increased percentage of resistant to Fluoroquinolones and Carbapenems. Recent culture reports have shown that microbials have developed resistance to last resort antibiotics such as colistin.[1] Antimicrobial stewardship program (AMSP) is a systematic approach to promote rational usage of antimicrobials in various health care settings.[2] It has been successfully implemented and has shown to be successive to decrease this menace of AMR in number of counties like Australia, Chile and Africa to name a few.

AMSP core strategies are in the form of pre and post prescription approaches. The front-end approach mandates pre-authorization approval before use of Watch and Reserve group of antimicrobials (among Access, Watch and Reserve group of antimicrobials-AWARE classification of existing antimicrobials) by an Infectious disease physician/ clinical microbiologist. The back-end approach is to do

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prospective audits and submit periodic reviews and give necessary feedback, which helps the clinicians to modify or discontinue specific antimicrobials.[3]
AMSP team consists of mainly Infectious Disease physicians, Clinical Pharmacists and Infection Control Nurses.[3] Scientific Evidence based treatment options can be selected based on the Hospital Antibiogram prepared by microbiologists, inclusion of fewer safe and proven efficacious antimicrobials in the Hospital Formulary. These should be given in appropriate dosage and for correct duration of time. It also stresses allocation of financial and other resources by the Government or Hospital Management and use of Information technology for successful implementation of the program.
It has been shown that only 40 percent of health care institutions have prepared proper SOP documents on AMSP and as low as 30 percent have implemented these strategies to curb antimicrobial resistance.[4] This clearly points lacunae in implementation of the program in India, which contains large population and ranks highest in terms of antimicrobial resistance followed by China and the Russian Federation.[5] This problem of AMR is recently taken as priority program by the Health Regulatory such as Ministry of Health and Family Welfare (MoHFW) and ICMR. They suggested to all the teaching hospitals in India to constitute a Hospital Pre- Authorization Committee and plan implantation of Audits on antibiotic usage.
Antimicrobial surveillance research focuses on the development of novel strategies of antimicrobial stewardship, to measure the impact of such programs and do point prevalence studies designed for health care settings in India.[6] So, the present study regarding knowledge, attitude and practices of AMSP among health care physicians was taken up.

Aim and Objectives

The present study was taken up to assess knowledge of health care physicians regarding Antimicrobial Stewardship Program (AMSP), their attitude towards the program guidelines and the extent to which they inculcate these guidelines into their regular clinical practice.

MATERIALS AND METHODS

Study Design and Setting

A qualitative cross-sectional study was conducted at the Government Medical College (GMC), Suryapet, Telangana, over a two-month period from September to October 2023.
The study employed a pre-validated, peer-reviewed, structured questionnaire as the data collection tool. The questionnaire comprised sections designed to assess three domains: (1) knowledge about AMSP, (2) attitudes towards the implementation of AMSP, and (3) practices related to antimicrobial prescribing and adherence to AMSP guidelines.

Procedure

Prior to commencement of the study, Ethical approval was obtained from the Institutional Ethics Committee of GMC, Suryapet (IEC/GMCS/2023 dated 07-09-2023). Informed consent was secured from all participating physicians after providing them with detailed information about the purpose and scope of the study.
Demographic information, including age, gender, department, and years of clinical experience, was collected from each participant prior to administration of the questionnaire. Responses to KAP items were recorded using a 5-point Likert scale, ranging from strongly disagree to strongly agree.

Statistical Analysis

Descriptive analysis was done to assess demographic data of participating physicians and responses to questions in knowledge, attitude and practice domain was expressed in percentages.

RESULTS

Table 1: Table shows responses of physicians to the questions reflecting practice of AMSP

S.no	Questions asked on practice of AMSP	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Do you think, there is a role of clinical pharmacist in doing regular antimicrobial audits?	0	9.4%	15.6%	37.5%	37.5%
2.	Do you think, there is a need for formulary restriction/ pre-authorization for use of high end antimicrobials	0	3.2%	16.1%	61.3%	19.4%
3.	Do you, as a physician encounter some patients with infectious diseases who have developed resistance to many antimicrobials	0	0	9.7%	67.7%	22.6%
4.	Do you frequently use reserve group of antimicrobials?	25.8%	38.7%	12.9%	22.6%	0

A total of 32 physicians in Government Medical College, Suryapet responded to the questionnaire (13 were postgraduates, 19 were faculty from various Departments). The questionnaire was divided into 3 sets of questions, reflecting knowledge, attitude and

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practice domains. The guidelines of AMSP were known to 81.3% of the physicians.

Knowledge domain: The questionnaire had 10 questions, to assess the knowledge of the participating physicians about AMSP guidelines. The antimicrobials are divided into Access, Watch and Reserve groups (AWARE classification) and 68.8% of physicians were aware of this classification. 78.1% of physicians in the study agreed that antimicrobials prescribed for surgical prophylaxis vary according to the nature and duration of the study. Some fixed dose combinations of antimicrobials available in pharmacies are irrational and this was known to 93.8% of the participating physicians. Rapid Diagnostic tests serve to prevent emergence of antimicrobial resistance was known to 90% physicians in the study. 87.5% of physicians were aware that poor infection control practices contribute to the problem of antimicrobial resistance. All the participating physicians agreed, that dose modification is required in renal and/or hepatic disease and safe disposal of antimicrobials is required to curb antimicrobial resistance.

Attitude domain: Likert scale which had graded responses from strongly agree to strongly disagree was used to assess the attitude of the participating physicians towards AMSP guidelines (Figure 1-4).

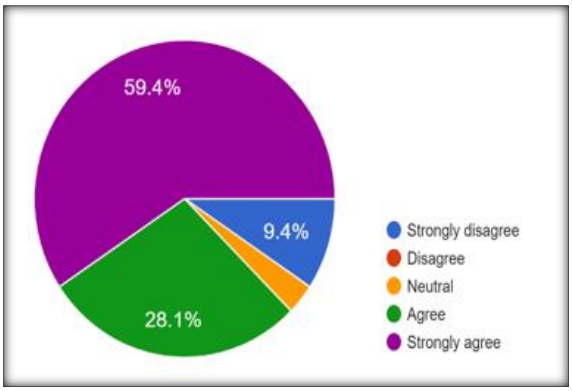

Figure 1: Figure shows responses to the question: Do you agree that there is need of CPD for improving prescribers' knowledge on appropriate antimicrobial usage?

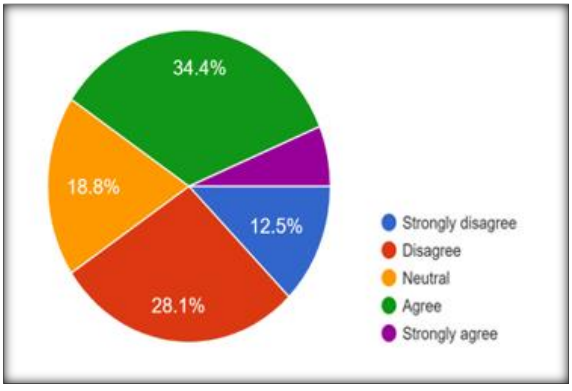

Figure 2: Figure shows responses to the question: Do you as a physician, sometimes use antimicrobials for non- infectious diseases?

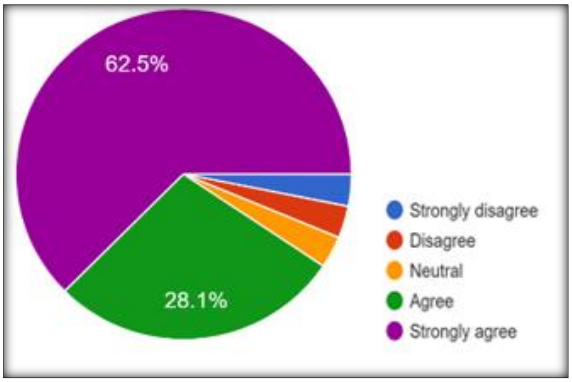

Figure 3: Figure shows responses to the question: Do you think, there is a role of clinical pharmacist in doing regular antimicrobial audits?

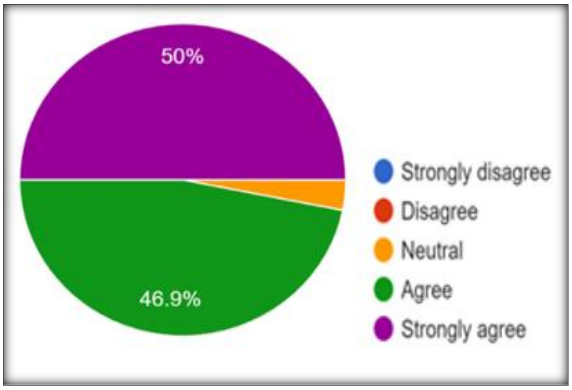

Figure 4: Figure shows responses to the question Do you think, there is a need for formulary restriction/ preauthorization for use of high end antimicrobials

Practice domain: Questions asked in practice domain reflected antimicrobial prescribing practices of the participating physicians and were recorded on 5-point Likert scale and analysis was done (results expressed in percentages, as shown in table 1).

DISCUSSION

The escalating threat of antimicrobial resistance (AMR) in India remains a critical public health concern, primarily driven by irrational prescribing, over-the-counter accessibility of antimicrobials, and suboptimal infection control practices. Given that clinicians are pivotal to appropriate antimicrobial prescribing and form the backbone of effective Antimicrobial Stewardship Program (AMSP) implementation, assessing their knowledge, attitude, and practices (KAP) becomes essential.

In the present study, a substantial proportion (81.3%) of participating physicians demonstrated awareness of AMSP guidelines. Most respondents strongly agreed on the importance of Continuous Professional Development (CPD) programs to enhance the quality of antimicrobial prescribing. These findings closely align with those reported by Akshara et al,[1] where over 90% of healthcare workers had knowledge of AMSP, and 87.5% expressed the necessity for ongoing CPD initiatives.

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Furthermore, 68.8% of physicians acknowledged the classification of antimicrobials into Access, Watch, and Reserve groups, recognizing the importance of formulary restriction or pre-authorization for the use of Reserve antimicrobials. This observation resonates with the findings by Verma SC et al,[2] where 88% of physicians advocated for pre-authorization protocols for Reserve antimicrobials, indicating consistent awareness about restrictive antibiotic usage policies.

Similarly, in a study by Nishat et al,[9] interns and postgraduate medical trainees showed a generally good level of awareness concerning AMR and AMSP, though practical application varied, underlining the need for reinforcing stewardship behaviors in early medical education. This is further corroborated by Badar et al,[10] who identified a positive attitude towards stewardship among physicians in tertiary hospitals but noted significant gaps in practical implementation, suggesting that knowledge does not always translate into appropriate clinical practice.

Khadse et al,[11] emphasized the tangible impact of AMSP on reducing AMR, reinforcing that structured interventions and strict adherence to stewardship protocols can yield measurable outcomes. Their study highlighted how AMSPs not only foster rational antimicrobial use but also enhance institutional policies and clinical outcomes.

Moreover, the foundational study by Thakolkaran et al,[12] identified that while most physicians possessed adequate knowledge about antibiotic prescribing, there was variability in attitude and adherence to rational prescription practices. This underscores the pressing need to bridge the knowledge-practice divide, particularly through regular training, audit-feedback mechanisms, and institutional support.

Mousami et al,[7] also pointed out the disjunction between awareness and application of AMSP principles, affirming the necessity to integrate AMSP teachings into the undergraduate curriculum,[8] thereby shaping responsible prescribing behavior early in medical education.

This study highlights the need of physicians to improve knowledge of rational usage of antimicrobials and bring them into practice to curb antimicrobial resistance. The strength of the study is that the participation of in the study was voluntary and confidentiality of participating physicians was maintained, so that reliable answers without any peer pressure were obtained. The study was limited to health care physicians, as knowledge of improving prescribing practices for writing appropriate prescriptions mainly lies in their hands. But most of the study participants were postgraduates, which is the major limitation.

CONCLUSION

The study highlights the gray areas which need to be improved in tackling the growing threat of antimicrobial resistance. There is also more need for continuous educational programs to the physicians for successful implementation of the antimicrobial stewardship program, which helps to combat the evil of antimicrobial resistance and preserve the existing antimicrobials.

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