Awareness and Understanding of the Antimicrobial Stewardship Among Medical Professionals at Teaching Hospital of Rahim Yar Khan, Southern Punjab

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ABSTRACT

Objective: To determine the first-hand knowledge regarding awareness of antimicrobial stewardship among house officers, postgraduate trainees, and consultants working in teaching hospital of Rahim Yar Khan.

Study Design: cross-sectional single-centre study

Place and Duration of Study: This study was conducted at the at Sheikh Zayed Hospital Rahim Yar Khan from May 2023 to December 2023.

Methods: This cross-sectional single-centre study was conducted in 08 months from May 2023 to December 2023 at Sheikh Zayed Hospital Rahim Yar Khan, a teaching hospital of Southern Punjab, Pakistan. A total of 200 participants were recruited including house officers, postgraduate trainees, and consultants. A self-developed questionnaire comprised of 30 questions was distributed, and all the data was analysed by using SPSS version 23.

Results: Regardless of experience and educational attainment, the findings showed that participants lacked knowledge on antimicrobial stewardship. The results showed that just 14 individuals (7.0%), had a more improved understanding of antimicrobial stewardship. Of the participants, 87 (43.5%) had learned their information online. The house officers, postgraduate trainees, and consultants all had low level of awareness regarding antimicrobial stewardship.

Conclusion: This study showed that there is a poor knowledge of antimicrobial stewardship among medical professionals. However, the participants expressed support for the implementation of antimicrobial stewardship in all healthcare settings, including teaching institutions.

Key Words: Antimicrobial Stewardship, Medical Professional, Awareness

INTRODUCTION

According to the US Centres for Disease Control and Prevention (CDC), antibiotic resistance is becoming more prevalent and a bigger issue. The World Health Organisation (WHO) has identified antibiotic resistance as one of the top ten dangers. It undermines modern healthcare and enhances changes to therapy for different types of infections.[1]

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About 500,000 cases of infection with various strains of newly identified or antibiotic-resistant bacteria have led to a rise in its prevalence.[2,3] Antimicrobial therapy is selected according to the traits of the causing bacteria as well as the symptoms and complaints of the patient. The pathogen and colonising flora gain resistance to the antimicrobial medicine in order to gain its potency. Licenced medical professionals, including doctors and surgeons, are required to deliver their patients the greatest medication options based on their individual needs. Antimicrobial medication prescribers are tasked with two different, frequently incompatible roles. With their help, they tried to give each patient the best care possible, but they also had a responsibility to stop the spread of antibiotic resistance and maintain the usefulness of antibiotics for both current and future patients as well as the public's health.[4] The Infectious Diseases Society of America (IDSA) has acknowledged antimicrobial stewardship (AMS) as a critical intervention in the fight against antimicrobial resistance (AMR). Antimicrobial stewardship (AS), according to IDSA, is the process of optimising antimicrobial preference, the dosage, route, and duration of therapy to

maximise clinical recovery or infection prevention while minimising unintended consequences, such as the emergence of resistance, adverse drug events, and cost.[5,6] As stated in AS principles, medical facilities with a well-established laboratory infrastructure for microbiology might readily switch from traditional empirical therapy to targeted therapy upon identification of culture results. The concept of the "role of education in antimicrobial stewardship" is a way to simplify or de-escalate the use of antibiotics. Targeted therapy saves costs and minimises unintentional exposure to broad-spectrum antibiotics. De-escalation may also entail stopping empirical antibiotic treatment based on poor culture results and clinical guidelines.[5,7,8] Targeted therapy emphasises the prescription of older, narrow-spectrum drugs. This is a common practice in northern European countries with restricted antimicrobial application, such as Scandinavia and the Netherlands, and has been taught in medical schools.

Antibiotic prescribers should be at the forefront of the fight against antimicrobial resistance (AMR) in order to reduce improper antibiotic consumption and foster an antimicrobial stewardship (AMS) culture. In the fight against antimicrobial resistance (AMR), it is crucial to comprehend the level of knowledge, attitudes, and practices of young doctors, particularly house officers, as well as the degree to which universities and postgraduate schools view AMR as a key educational concern. Thus, the purpose of this research is to learn firsthand how well-informed house officers, postgraduate trainees, and consultants are about antimicrobial stewardship programmes (ASP).

METHODS

This cross-sectional study was conducted at Sheikh Zayed Hospital Rahim Yar Khan, Pakistan from May 2023 to December 2023 after approval from the Institutional Review Board. The study comprised of a questionnaire, the responses have been compared against the definition proposed by WHO, APIC, and the Society for Healthcare Epidemiology of America (SHEA).[10] All these three reliable sources included two main components of ASP; careful and need-based prescription of Antibiotics and reduce bacterial resistance. Keeping in mind these components we categorized results in 'Satisfactory' and 'Not Satisfactory' categories. This questionnaire assisted in the evaluation of the overall knowledge, attitude, and practical approach towards antibiotic usage, resistance, and Antibiotic Stewardship Program of all the participants. It comprised of 30 questions. The first two questions were open-ended while the remaining 28 questions were close ended with two options of 'Yes' or 'No'.

Using the snowball sampling method, a total of 200 participants have been invited to be part of this study from Sheikh Zayed Hospital Rahim Yar Khan, including 68 (34%) house officers, 66 (33%) PGRs and 66 (33%) Consultants.

Statistical analysis: Statistically, the questionnaire was examined using SPSS version 23. Percentages have been calculated for the categorical data. The p-values were considered as two-tailed and a p-value of < 0.05 was set as significant.

RESULTS

More than 90 % of the participants mainly house officers were unaware of the actual concept and idea behind antimicrobial stewardship (Table-I). A large number of participants have acquired knowledge regarding antibiotics from the internet; House officers 27 (38.2%), PGRs 31 (47%), and Consultants 29 (43.9%), followed by Pharmacology guidebooks. Few of them also need medical representatives from pharmaceutical companies or pharmacists to update their knowledge as shown in Table-II (p=0.3).

The remaining 28 questions have 'Yes' or 'No' options. The results are presented in table-III in the form of percentages. According to outcomes, more than 90 % of the participants have responded 'Yes' to acquiring knowledge regarding the updated antibiotic spectrum. All of the consultants have responded in favour of the knowledge regarding the spectrum of a different antibiotic, while only a few PGRs and House officers responded against it (p=0.01) with updated knowledge of antibiotics is necessary (p=0.03). More than 90 % of the consultants and PGRs have responded in favour of the updated knowledge of antibiotics in medical careers while surprisingly 26.50 % of house officers have voted against it (p=0.1). More than 93 % of the participants have agreed that ASP improves patients' quality of life (p=0.1), with results signifies ASP reduces bacterial resistance (p=0.001) and ASP decreases hospital stays and costs (p=0.02). Most of the medical staff would like more education on antibiotic resistance (p=0.000) with hand washing plays an important role in prevention of infection (p=0.000). Surprisingly the results of prescribing broad-spectrum antibiotics before definite diagnosis was also significant (p=0.000). The analysis of results also showed that following the national guidelines before prescribing antibiotics was significant (p=0.00). Knowledge of most resistant organisms in hospital is necessary with significant results (p=0.03) and knowing the common bacteria that causes different infection in our body is also important (p=0.000). Knowing the antibiotic susceptibility pattern of different antibiotics have significant result as well (p=0.00). However contrary to common belief, the results of prescribing antibiotics in common cold, sore throat, flu, diarrhea etc was significant with p=0.000.

Table No. 1: Knowledge regarding the Antibiotic Stewardship Program

Doctors Group	Satisfactory	Not Satisfactory	Total	P value
House officers	4(5.9%)	64(94.1%)	68 (100%)	
PGRs	4(6.1%)	62(93.9%)	66 (100%)	
Consultants	6(9.1%)	60(90.9%)	66 (100%)	0.7

Table No. 2: Source of knowledge regarding Antibiotics

Doctor Group	Medical Reps. Or pharmacist	Internet	Pharma Guidebooks	Others	Total	P Value
House officers	13(19.1%)	27(39.7%)	26(38.2%)	2(2.9%)	68	
PGRs	12(18.2%)	31(47.0%)	20(30.3%)	3(4.5%)	66	0.3
Consultants	11(16:7%)	29(43.9%)	18(27.3%)	8(12.1%)	66	

Table No. 3: Responses of participants to questions regarding Antibiotics Prescription

Questions	Consultants		PGRs		House Officers		P value
	Yes	No	Yes	No	Yes	No	
Strong Knowledge of antibiotics is important in a medical Career?	97%	3%	89.4%	10.6%	91.2%	8.8%	0.1
Prescribing broad Spectrum Antibiotics causes Antibiotic Resistance?	78.8%	21.2%	83.3%	16.7%	82.4%	17.6%	0.6
Knowing the spectrum of different antibiotic groups is necessary?	100%	0.00%	92.4%	7.6%	91.2%	8.8%	0.01
Does ASP improve the quality of patient care?	84.8%	15.2%	74.2%	25.8%	73.5%	26.5%	0.1
ASP Reduces Bacterial Resistance?	83.3%	16.7%	71.2%	28.8%	60.3%	39.7%	0.001
ASP decreases hospital stays and costs?	77.3%	22.7%	72.7%	27.3%	60.3%	39.7%	0.02
Updated knowledge of antibiotics is necessary?	98.5%	1.5%	90.9%	9.1%	89.7%	10.3%	0.03
Cost-effectiveness should be considered in prescribing antibiotics?	74.2%	25.8%	75.8%	24.2%	85.3%	14.7%	0.13
I would like more education on antibiotic resistance?	97%	3%	90.9%	9.1%	73.5%	26.5%	0.000
I would like more education on appropriate use of antibiotics?	89.4%	10.6%	87.9%	12.1%	82.4%	17.6%	0.2
Antibiotic Resistance is a major problem all across the world?	78.8%	21.2%	90.9%	9.1%	79.4%	20.6%	0.04
Inappropriate use of antibiotics causes antibiotic bacterial resistance?	97%	3%	93.9%	6.1%	92.6%	7.4%	0.3
Patients' noncompliance is a major cause of Bacterial Resistance?	59.1%	40.9%	72.7%	27.3%	72.1%	27.9%	0.07
Poor infection control by health care causes bacterial resistance?	63.6%	36.4%	68.2%	31.8%	69.1%	30.9%	0.6
Hand washing plays an important role in prevention of infection?	98.5%	1.5%	87.9%	12.1%	79.4%	20.6%	0.000
Use of antibiotic in animals and poultry fields causes antibiotic bacterial resistance?	18.2%	81.8%	31.8%	68.2%	22.1%	77.9%	0.05
Prescribe broad spectrum antibiotics before definite diagnosis?	48.5%	51.5%	21.2%	78.8%	33.8%	66.2%	0.000
Prescribe narrow spectrum antibiotics when there is a definite diagnosis?	72.7%	27.3%	71.2%	28.8%	73.5%	26.5%	0.9
Follow the national Guidelines before prescribing antibiotics?	92.4%	7.6%	78.8%	21.2%	72.1%	27.9%	0.00
Knowledge of most resistant organisms in hospital is necessary?	97%	3%	87.9%	12.1%	88.2%	11.8%	0.03
Knowing the spectrum of activity of selected antibiotic is necessary?	93.9%	6.1%	90.9%	9.1%	89.7%	10.3%	0.5
Knowing the common bacteria that causes different infection in our body is important?	98.5%	1.5%	86.4%	13.6%	70.6%	29.4%	0.000
Knowing the antibiotic susceptibility pattern of different antibiotics?	81.8%	18.2%	77.3%	22.7%	61.8%	38.2%	0.00

Contact hospital pharmacist for antibiotic choice?	43.9%	56.1%	43.9%	56.1%	54.4%	45.6%	0.2
Contact microbiologist to know the common resistant organisms and antibiotic susceptibility in the hospital?	83.3%	16.7%	80.3%	19.7%	82.4%	17.6%	0.8
Contact the clinical pharmacist to see availability of the drug?	81.8%	18.2%	72.7%	27.3%	79.4%	20.6%	0.2
Prescribe antibiotics in common cold, sore throat, flu, diarrhea?	15.2%	84.8%	19.7%	80.3%	38.2%	61.8%	0.000
Interpreting an Antibiogram?	62.1%	37.9%	62.10%	37.9%	41.2%	58.8%	0.2

DISCUSSION

This cross-sectional survey-based study has delivered some very contrasting results regarding antimicrobial stewardship in Rahim Yar Khan, Pakistan. As indicated by the outcomes, there were only a few individuals in all three categories who had satisfactory knowledge about the Antimicrobial Stewardship Program (ASP). The highest recorded option of 'Satisfactory' was of consultants with a frequency of 9.1 % only (p=0.7). The Internet is the most utilized source of updating knowledge among all three categories of professionals regarding antibiotics which has its benefits and losses (p=0.3).

According to Pereira et al (2015), E-learning is now widely used in the field of medical education. It facilitates face-to-face, online, and mixed learning by blending traditional classroom methods with online approaches. The World Wide Web has made knowledge more accessible, web-based learning provides increased access to learning by overcoming distance.[10] The observed efficiency of a blended e-learning curriculum on basic health care prescription practice prompted the creation and deployment of blended modules for primary care in the United Kingdom (UK) and Scotland.[11,12] Furthermore, despite its claimed effectiveness, INTRO, an online curriculum piloted in five European nations, presented crucial cautions regarding the significance of such programs being responsive to the learning requirements and practices of diverse cultures and healthcare systems.[13]

In an article by Pulcini and Gyssens (2013), it has been mentioned that the Antibiotic Stewardship Program has been mainly conducted at the postgraduate level which could manifest the practice among the professionals. It becomes evident that antimicrobial stewardship is more likely to be successful if it begins much earlier.[4] The results of the current study have also similar outcomes in terms of the knowledge of house officers regarding ASP, which is alarming for an underdeveloped country. According to Gyssens (2018), AS education is required for the whole healthcare workforce as well as the general public. To have the most influence, this type of training should begin early in the undergraduate program.[14]

In Pakistan, antimicrobial stewardship program is still an untested methodology for combating antibiotic resistance. This study found that interviewed physicians had little awareness about ASP. As there is no ASP-related subject in the ongoing medical curriculum at both the undergraduate and postgraduate levels.[15,16,17] It is perhaps unsurprising that physicians are currently not aware of the functions of a hospital ASP. In Pakistan, the health system bears a gap in good doctor-pharmacist coordination, may it be a discussion before prescriptions or advice on a difficult case. Most doctors make decisions on their own and consider consulting a pharmacist abominable. We need to develop a good physician-pharmacist relationship in our setups to improve the quality of health care.[18,19] Additionally, an antibiogram is a very useful measure to recognize the prevalence of any microbial infection. Unfortunately, this technique is not very common in Pakistan which eventually aggravates the antibacterial resistance among the general population.[20]

Only a few studies have been conducted regarding awareness and implementation of antimicrobial stewardship program in Pakistan. This study has a major limitation because it is a single-centre study. Although it has been conducted in one of the main public sector medical institutes of Punjab, Pakistan this study cannot represent the views and knowledge level of all the young doctors, trainees, and consultants of Pakistan.

CONCLUSION

This report demonstrates the medical community's glaring lack of efforts in antimicrobial stewardship. It is a regular issue to provide broad-spectrum antibiotics in the absence of a definitive diagnosis. Prior to writing an antibiotic prescription, chemists are not consulted. It is imperative that medical professionals attend appropriate awareness seminars addressing antimicrobial stewardship in due course.

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