

Antibiotic Stewardship: Perception of General Practitioners regarding Emerging Challenges

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ABSTRACT

Introduction: Antibiotics are among the most frequently prescribed classes of drugs all over the world with approximately 50% of it being used without any rationale. This leads to increase antibiotic resistance and further complications. General practitioners are first line of contact and majority of the general population presents them for their health issues. Their perception and attitude regarding antibiotic prescription plays an important role in emerging antibiotic resistance.

Objective: To identify knowledge and perception of General practitioners regarding antibiotic stewardship and associated challenges

Methodology: This is a cross-sectional study conducted through online platform conducted through a pretested self-administered questionnaire. It included questions related to location and workplace information. Knowledge and practices of the participants regarding antibiotic use in their clinical practice and experience of health care workers related to patient exposure and protective equipment. Data was entered and analyzed using SPSS statistical software Version 19.

Results: A total of 270 out of 373 agreed to participate in the study with a response rate of 72%. On exploring relevance of importance of antibiotic resistance in daily work majority 81% agreed that it is highly relevant. Similarly, when asked about reasons for increasing antibiotic irrational use of antibiotics was a major reason identified by 96% of male and 84% of females.

Physicians play a very significant role in education of patients regarding antibiotic resistance when prescribing medicine. To explore GPs practice regarding education to patients around 66% of male and 85% of the females agreed that they educate their patients when prescribing while 35 % male and 15% female physicians did not educate their patients because of lack of time available for patient education during consultation.

Conclusion: Antibiotic resistance is on the rise. General practitioners have limited knowledge regarding rationale use, however their practice is limited due to poor accountability, increase demand from patients and to enhance their patient satisfaction

Keywords: Antibiotics, stewardship, general practitioners.

INTRODUCTION

With the advent of antibiotics, infections which were considered as lethal once, are now easily treatable. Timely initiation of antibiotics for treatment of infections decreases both morbidity and mortality.¹ The unnecessary use of antibiotics in outpatient clinics as well as in hospitals has played a major role in antibiotic resistance.² Reports from the United States of America revealed that most of the antibiotics are prescribed in outpatient clinics.³ In Europe, most of the antibiotics are prescribed by general practitioners i.e. around 80 to 90 percent.⁴ Many reports have shown that the most inappropriate use of antibiotics is for viral respiratory tract infections such as viral associated bronchitis, sinusitis and otitis media.⁵

The use of antibiotics needs to be optimized for effective treatment of infections and combating antibiotic resistance.⁶ According to a report published by CDC in 2019, the number of antibiotic-resistant infections that occur annually in the US is approximately 2.8 million and among these around 35000 people die of resistant infections. If this trend persists, it is estimated by 2050, there will be 10 million antimicrobial resistance deaths worldwide, costing the world up to \$100 trillion.⁷ A data published by CDC showed that approximately 1 in 3 antibiotic prescriptions are inappropriate.⁸ Sulis G et al reported that antibiotics are among the most frequently prescribed classes of drugs and it is estimated that approximately 50% of antibiotic use in both the outpatient and inpatient settings is inappropriate.⁹

Various factors may have an impact on physician prescribing behaviour including increase work load, patient's expectation and demand, lack of patient education on problems related to antimicrobial resistance,¹⁰ and pressure from pharmaceutical industry etc. this overuse pattern may result in prolong hospital stay, increased rate of complications and increased burden on healthcare system.¹¹ World Health Organization (WHO) recommends that the percentage of antibiotics prescribed in outpatient clinics should be less than 30 percent.⁹

World Health Assembly in 2015 recognized antimicrobial resistance as a public health threat worldwide. At the same time the global Action Plan was set to overcome antimicrobial resistance which had set five strategic objectives. One of these objectives was to "Optimize the use of antimicrobial medicines". To achieve this objective antimicrobial stewardship programs were encouraged and used as global tool to provide guidance on judicious antimicrobial use.¹² Antibiotic Stewardship Programs refer to programmes that are meant to teach methods to optimize antimicrobial use.¹³ These programs also help in improving patient outcomes, reducing antimicrobial use, and thus reducing health-care expenditure.¹⁴ The objective of this study was to assess knowledge, attitudes, and practices of general practitioners regarding antimicrobial resistance and to determine the factors that lead to over-prescription of antimicrobials in primary care settings.

MATERIAL & METHODS

This survey was conducted from April 2020 to June 2020. General practitioners were selected by using non-probability convenient sampling techniques. Data was collected through a self-administered online questionnaire designed by using software online Google forms. A pretested self-administered 20 item questionnaire was prepared after extensive literature review from Google Scholar and consisted of three parts. The first section included socio-demographic data, location and workplace information. The second segment inquired about the knowledge and practices of the participants regarding antibiotic use in their clinical practice and the third section investigated the experience of health care workers related to patient exposure and protective equipment. Proposal was approved from ERC committees and participants were assured that their data will be kept confidential and will only be used for research purpose. Sample size was calculated using frequency of physicians who agreed that antibiotics are overuse in general as 50% with margin of error 5% at 95% confidence interval (CI). The computed sample size was 373 to which 5% non-response

rate was added. Data was entered and analyzed using the SPSS statistical software Version 19. Associations between variables were tested with the Pearson Chi-square with significance set at the $p < 0.05$ level and confidence level at 95%.

RESULTS

A total of 373 participants were approached, since it was an online survey, 270 out of 373 agreed to participate in the study with a response rate of 72%. Among the study participants, 63% were male and 37% were females. When inquiring about age group, 50% were between 25-35 years' age group, while 40% were in 35 to 45 years age group and 10% were above 45 years of age group. On asking about qualifications majority of the respondents had family medicine post graduate qualification. Majority of the participants (45%) had 3-year residency in family medicine followed by 19% with diploma in family medicine, 13% had MRCGP and 20% had Fellowship degrees. Among the participants, there was a preponderance of South Asian physicians followed by physicians from European and South American origin.

39% of the respondents were practicing in medical center/poly clinic followed by 33% working in hospital while 18% were doing group practice and only 10% were doing single practice. When exploring about number of years of practice more than half 52% of the general practitioners were practicing for 5 years followed by 27% practicing for >5-10years. Only small number (10%) were practicing for more than 11 years. Similarly, when exploring number of patients, 35% were consulting 25 patients per day followed by 33 % consulting 15-20 patients per day.

On questioning about relevance of importance of antibiotic resistance in daily work majority 81% agreed that it is highly relevant, 15% responded as moderately relevant and only small number 4% marked as not relevant. Graph 1 depicts the perception of physicians prescribing behavior influence on antibiotic resistance development in their region, more than 70% from all regions agreed to this fact and only small number 25% or less did not agree to this fact or were not sure about the influence of prescribing behavior on antibiotic resistance. Graph 2 shows the relevance of antibiotic resistance with physician practice. Majority of the general practitioners from all regions clearly agreed to the relevance of antibiotic resistance to their daily practice, however only a small number from all regions did not agree or were not sure about the relevance.

Table 2 explains the knowledge and practices of general practitioners regarding antibiotic resistance and shows the gender-based response of general practitioners regarding relevance of antibiotic resistance within their practice. When asked about reasons for increasing antibiotic irrational use of antibiotics was a major reason identified by 96% of male and 84% of females. Similarly, 90% of the male and 93% of the female physician agreed that self-medication is one of the common causes of increasing antibiotic resistance. When asked upon unhealthy lifestyle practices all of the male GPs (100%) and (96%) female physician disagree that poor hygienic leads to antibiotic resistance.

On further questioning about poor compliance to medications around (60%) of the male and 64% of the female GPs considered this as one of the reasons of antibiotic resistance while a little over two third of the practitioners disagree to this fact. This disagreement

may point towards their poor concept regarding antibiotic resistance. Similarly, frequent use of second and third generation antibiotic was also considered as a risk factor by 60% of male 65% of the female GPs. This indicates the wrong perception of general practitioners regarding antibiotic resistance. In addition, unregulated pharmacy was considered as a risk factor by more than 75% of both gender physicians.

Physicians play a very significant role in education of patients regarding antibiotic resistance when prescribing medicine. To explore GPs practice regarding education to patients around 66% of male and 85% of the females agreed that they educate their patients when prescribing while 35 % male and 15% female physicians did not educate their patients. On further exploring the reason for not educating despite of majority of all agreeing to the fact that it is relevant to discuss with patients, 49% of the male GPs and 31% of the females GPs did not find enough time for education during consultation. Similarly, 52 % of male and 32% of female physicians found lack of interest as a major reason to not discuss regarding antibiotic and its side effects. Only 200 from both the groups were concerned that discussion may make the patient uncomfortable.

Table 1: Demographic Profile and Information Regarding Practice

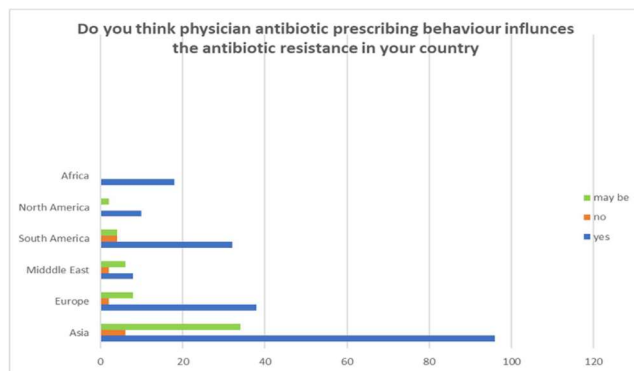
Variables	N	Percentage
Gender		
Male	100	37
Female	170	63
Age Group		
25yrs - 35yrs	134	50
36yrs - 45yrs	108	40
Above 45yrs	28	10
Region of practice		
Asia	152	56
Europe	48	18
South America	40	15
North America	12	4
Africa	18	7
Type of family medicine training		
No training	10	4
DNB / 3yr residency	122	45
Diploma in Family Medicine	48	18
MRCGP INT/ MRCGP UK	36	13
Fellowship in Family Medicine	54	20
Type of practice		
Single Practice	26	10
Group Practice	49	18
Medical Centre/ Day Care Centre / Poly Clinic	105	39
Hospital Practice	90	33
Work experience as a GP/Family Physician		
5 yrs	141	52
5 - 10 yrs	73	27
11 - 15 yrs	29	11
More than 15yrs	27	10
Number of patients seen at work place/practice on daily basis		
10 – 15	89	33
16 – 20	45	17
21 – 25	42	15
More than 25	94	35

Table 2: Practice of general practitioners regarding antibiotic resistance

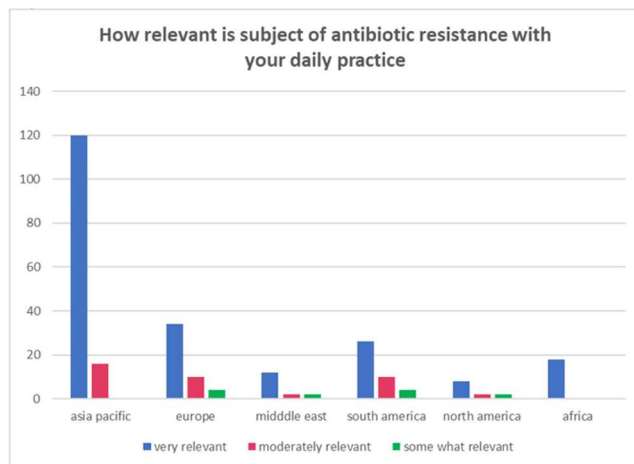
Variables	Male N (%)	Female N (%)	P-value
1 While prescribing Antibiotics, do you discuss the subject of Antibiotic Resistance with your patients suffering from infections?			
Yes	66(66)	144(85)	0.00
No	34(34)	26(15)	
2 If no what are the reasons not to talk about antibiotic resistance (AMR).			
a Lack of time in consultations	48(48)	52(31)	0.00
b Concerned that it may unsettle the patient	20(20)	34(20)	0.00
c Lack of patient interest	52(52)	54(32)	0.001
d Not relevant to discuss with patient	6(6)	6(3)	0.001

Table 3: Reasons of Antibiotic resistance identified by the General Physicians

Variables	Asia	South America	North America	Africa	Europe	P value
Irrational use of antibiotics						
Yes	50.4%	15.2%	4.1%	11.1%	7.4%	0.175
No	6.3%	1.9%	0.4%	0.7%	2.6%	
Self-medications by patients						
Yes	52.6%	16.7%	3.7%	11.1%	7.8%	0.28
No	4.1%	0.4%	0.7	0.7	2.2	
Lifestyle						
Yes	0.0%	0.7%	0.0%	0.0%	1.5%	0.00
No	56.7%	16.3%	4.4%	11.9%	8.5%	
Poor compliance						
Yes	39.6%	5.6%	3.3%	7.4%	6.3%	0.000
No	17.0%	11.5%	1.1%	4.4%	3.7%	
Unregulated pharmacy						
Yes	47.8%	10.0%	3.0%	10.0%	7.8%	0.004
No	8.9%	7.0%	1.5%	1.9%	2.2%	
Frequent use of higher generation antibiotics						
Yes	39.3%	10.0%	3.3%	6.3%	4.1%	0.029
No	17.4%	7.0%	1.1%	5.6%	5.9%	
Unhygienic practices						
Yes	4.4%	1.5%	0.0%	3.7%	0.0%	0.000
No	52.2%	15.6%	4.4%	8.1%	10.0%	



Graph 1:



Graph 2:

DISCUSSION

Antibiotic overuse is a major public health challenge worldwide. Antibiotic prescription is an important area of concern due to emerging threat of resistance worldwide which may lead to increased morbidity and mortality. General practitioners are first line of contact and majority of the general population presents them for their health issues. Their perception and attitude regarding antibiotic prescription plays an important role in emerging antibiotic resistance.

On questioning about relevance of importance of antibiotic resistance in daily work majority 81% agreed that it is highly relevant, with small number marking as not relevant. These results are contrary to a study done by Nicholson A where majority 83% of the general practitioners thought that this issue is a major concern globally rather than national and personal level¹⁵. This may be due to limited data available locally or due to poor understanding regarding this important issue.

In our study, a vast majority (96%) of physicians identified irrational use of antibiotics as a reason for AMR. The reasons for irrational use may be due to availability of antibiotics without prescription, knowledge and prescribing behaviors of physicians and dispensers and deficiency in medical training. The participating physicians in this study identified poor compliance to antibiotics as a cause of antibiotic resistance. Similarly, Holm A et al stated that poor compliance to antibiotics may increase antimicrobial resistance¹⁶.

When exploring perception of physicians prescribing behavior influence on antibiotic resistance development in their region, majority (> than 70%) from all regions agreed to this fact and only small number 25 % or less either did not agree to this fact or were not sure about the influence of prescribing behavior on antibiotic resistance. In a study many physicians reported feeling pressure to prescribe antibiotics due to patient expectations, and this often led them to prescribe even when not clinically indicated, partly to avoid patient dissatisfaction.¹⁷

Frequent use of higher generation antibiotics was recognized as a reason of antibiotic resistance in our study. A review article published in 2020 found much higher resistance rates in medical practices where the prescription of antibiotics was high. This suggested that a probable relationship exists between over-use of antibiotics and antibiotic resistance¹⁸.

When inquired about relationship between antibiotic resistance and practice patterns of general practitioners, majority of the general practitioners from all regions clearly agreed to the fact that there is a relevance of antibiotic resistance to their daily practice. These results are similar to a study done by Sami et al in Iran, where 97.2% of physicians acknowledged AMR as a major concern relevant to their practice and prescribing patterns¹⁹. These findings may be explained by the increased number of continuous medical education sessions and the recent trend of following guidelines for treatment of infections.

Majority of the general practitioners from all regions accepted that antibiotics is major health problem worldwide increasing antibiotic resistance. However, their contribution as health care educators to educate patients regarding side effects is not promising because of lack of time commitment.

All of them agreed to various factors (easy availability patient's choice and higher generation antibiotics) as a major reason for antibiotic resistance however majority are not ready to take a lead as health care professional to improve education to decrease antibiotic resistance.

CONCLUSION

Antibiotic resistance is a major health challenge especially for developing world where health care infrastructure is unstable with limited awareness among general population and poor regulatory mechanisms. Results of this study will help us to identify areas to improve antibiotic prescription behaviors among general physicians and improve antibiotic resistance.

STRENGTHS/LIMITATIONS

Strengths:

- The study included a reasonably large sample of 270 general practitioners with a good response rate of 72%.
- It captured perspectives from practitioners across multiple regions (Asia, Europe, and the Americas), giving it a broader international outlook.
- The findings clearly highlight the important gap between GPs' knowledge and their actual clinical practice regarding antibiotic stewardship.

Limitations:

- Convenience sampling via an online survey may have introduced selection bias and limits the generalizability of the results.
- The sample was heavily skewed toward Asian practitioners (56%), which reduces its representativeness on a global scale.

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