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A CROSS SECTIONAL SURVEY ASSESSING KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING ANTIBIOTIC RESISTANCE AMONG 2ND, 3RD AND FINAL YEAR MBBS STUDENTS IN A TEACHING HOSPITAL IN NAVI MUMBAI.

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ABSTRACT

In 2011, the theme of World Health Day as 'Combat Antimicrobial Resistance was given No Action Today, No Cure Tomorrow'. The is a serious and global problem of antibiotic abuse and there is a growing need to urgently develop new strategies for the prevention of resistance of bacteria to antibiotics. The aim of this study is to evaluate the current knowledge, attitude, and practices regarding antibiotic use and antibiotic resistance (ABR) among the healthcare profession students at a Medical college. This study is a cross-sectional, questionnaire based survey. The validated questionnaire was distributed among 150 MBBS students from 2nd, 3rd, and final year. students and the results were presented in the form of graphs and tables. 94% of the 2nd year students knew that bacteria was not responsible for the common cold and influenza The knowledge of the final year in most of the questions were 100%. The final year students had a positive attitude towards ABR and antibiotics however the attitude of the 2nd year and 3rd year was found to be more casual. Practices of the final year students were found to be more sensible,100% of the students consult a doctor before starting an antibiotic except for the fact that 94% of the students stop taking the further treatment once they start feeling better after taking antibiotics. 98% of students from 2nd year believe indiscriminate antimicrobial use leads to the emergence of the growing problem of resistance. Our study provides important views regarding the knowledge, attitudes and practices about antibiotic resistance and its use among the future doctors. It revealed that most of the students were aware of antimicrobial resistance and its consequences. The only concern was their casual attitude regarding antibiotic use. This was an ICMR- STS approved project.

Keywords: ***Antibiotic resistance, questionnaire, MBBS students, knowledge, attitudes and practices.***

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INTRODUCTION

In 2011, WHO set the theme of World Health Day as 'Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow'[1]. This shows a serious and global problem of antibiotic abuse and there is a growing consensus to urgently develop new strategies for the prevention of resistance of bacteria to antibiotics. Antibiotics are the most frequently prescribed drugs, but they are often misused [2-3]. This contributes to the spreading of resistant strains of bacteria[4].One of the causes of a wrong prescribing behavior amongst physicians[5-7]. There are many factors which could influence doctors' decisions, leading them to breach the principles of good clinical practice. For example, the fear of possible future complications in their patients, or a desire to fulfill patients' expectations [1,8]. Patients' wrong habits and their lack of knowledge may also represent another leading cause for antimicrobial resistance [1,9-14]. Educational initiatives on the correct use and prescription of antimicrobial drugs, addressed to the Healthcare professionals, should thus be promoted[15]. In particular, it would be desirable to focus on the new generations of healthcare professionals [15-16]. Indeed, they must be fully aware of the increasing problem of antibiotic resistance, since they will be the future antibiotic providers.[1,15,16] With the increasing antimicrobial (AM) resistance, the implementation of antimicrobial education in the undergraduate (UG) curriculum is crucial as mere guidelines are not enough to change the behavior of the future prescribers.[17-18] This study delineates the knowledge, attitude, and practices (KAP) of the UG about AM, which exemplifies the principles of AM stewardship so that the loopholes in the teaching curriculum can be stitched in time. Evaluating KAP of amongst the future antibiotic prescribers about AMs education will facilitate better and more effective education for them. The aims and objectives of the study was to evaluate the current knowledge, attitude, and practices regarding antibiotic use and antibiotic resistance among the healthcare profession students at a Medical college, and to identify the gaps in the knowledge and practice of tackling the abuse of antibiotics.

MATERIALS AND METHOD

Survey and design

This study is a cross-sectional, questionnaire based survey which has been undertaken by the Department of Pharmacology and Therapeutics of a teaching hospital in Navi Mumbai, India which was conducted in 3 months time among a convenient sample of medical healthcare profession students. Participation was voluntary, anonymous and without compensation. The questionnaire was validated by subject experts for its content and relevance.

Sample size

The questionnaire was distributed to a batch of 150 medical students in their 2nd year, 3rd year and final year of MBBS. That is 50 students from 2nd,3rd and final year each.

Study procedure

The Institutional Ethics Committee's permission will be taken prior to the initiation of the study. Each participant was allotted 20 minutes to answer the questionnaire in the form of options that he/she feels appropriate to answer. students were asked to complete a validated questionnaire anonymously and Informed consent was obtained from the participants, to utilize their data for research purposes.

STATISTICAL ANALYSIS

The documented data was subjected for descriptive statistical analysis. All the results were calculated in percentages and frequency. Student's t-test was used for continuous variables.

Observations and result

The response rate was 100 percent among the 150 medical students who were asked to participate in the survey. We have distributed the results year wise in the following tables 1-10 and did a comparative analysis in tables.

Second year students analysis

Table 1
Distribution of data by knowledge variables of second year

	Question	true n(%)	false n(%)	uncertain n(%)
Q1	Indiscriminate antimicrobial use leads to the emergence of the growing problem of resistance	49 (98%)	1 (2%)	---
Q2	Antimicrobial resistance means that if they are taken too often, antimicrobials are less likely to work in the future	43 (86%)	7 (14%)	----
Q3	Bacteria cause common cold and influenza	3 (6%)	47 (94%)	----
Q4	Antibiotic Resistance is an important and serious global public health issue	47 (94%)	3 (6%)	----
Q5	Ineffective treatment can occur due to indiscriminate and injudicious antimicrobial use	46 (92%)	4 (8%)	----

Table no1 depicts that the knowledge of 2nd year students about antibiotic resistance is good.

Table 2
Distribution of data by attitude variables of second year

	Question	agree n(%)	disagree n(%)	uncertain n(%)
Q6	Antibiotics are safe drugs, hence they can be commonly used medication	24 (48%)	25 (50%)	1 (2%)
Q7	Skipping one or two doses does not contribute to the development of antibiotic resistance.	27 (54%)	18 (36%)	5 (8%)
Q8	Adverse effects of antimicrobials are reduced by using more than one antimicrobial at a time	20 (40%)	15 (30%)	15 (30%)
Q9	Injudicious use of antimicrobials shortens the duration of illness	14 (28%)	24 (48%)	12 (24%)
Q10	When you have a cough and sore throat, antimicrobials are the first drug of choice for early treatment and to prevent emergence of resistant strains	33 (66%)	5 (10%)	12 (24%)

In table 2 we are analyzing the attitude of the 2nd year students regarding antibiotic resistance. According to this result the attitude of the 2nd year students regarding antibiotic resistance is moderate.

Table 3
Distribution of data by practices variables of second year

	Question	yes n(%)	no n(%)	Uncertain n(%)
Q11	The Doctor prescribes a course of antibiotics for you. After taking 2–3 doses you start feeling better.			
Q 11A	Do you stop taking the further treatment?	14 (28%)	21 (42%)	15 (30%)
Q 11B	Do you save the remaining antibiotics for the next time you get sick?	9 (18%)	22 (44%)	19 (38%)
Q 11C	Do you discard the remaining, leftover medication?	28 (56%)	6 (12%)	16 (32%)
Q 11D	Do you give the leftover antibiotics to your friend/roommate if they get sick?	13 (26%)	24 (48%)	13 (26%)
Q 11E	Do you complete the full course of treatment?	42 (84%)	2 (4%)	6 (12%)
Q 12	Do you consult a doctor before starting an antibiotic?	36 (72%)	----	14 (28%)
Q 13	Do you check the expiry date of the antibiotic before using it?	29 (58%)	----	21 (42%)
Q 14	Do you prefer to take an antibiotic when you have cough and sore throat?	24 (48%)	24 (48%)	2 (4%)

From these observations it can be concluded that students have a casual approach towards antibiotic use.

Third year students analysis

Table 4
Distribution of data by knowledge variables of third year

	Question	true n(%)	false n(%)	uncertain n(%)
Q1	Indiscriminate antimicrobial use leads to the emergence of the growing problem of resistance	48 (96%)	2 (4%)	---
Q2	Antimicrobial resistance means that if they are taken too often, antimicrobials are less likely to work in the future	40 (80%)	10 (20%)	----
Q3	Bacteria cause common cold and influenza	16 (32%)	34 (68%)	----
Q4	Antibiotic Resistance is an important and serious global public health issue	48 (96%)	2 (4%)	----
Q5	Ineffective treatment can occur due to indiscriminate and injudicious antimicrobial use	41 (82%)	9 (18%)	----

From this we can interpret that the knowledge of 3rd year students about antibiotic resistance is good.

Table 5
Distribution of data by attitude variables of third year

	Question	true n(%)	false n(%)	uncertain n(%)
Q6	Antibiotics are safe drugs, hence they can be commonly used medication	40 (80%)	07 (14%)	3 (6%)
Q7	Skipping one or two doses does not contribute to the development of antibiotic resistance.	27 (54%)	15 (30%)	8 (16%)
Q8	Adverse effects of antimicrobials are reduced by using more than one antimicrobial at a time	37 (74%)	08 (16%)	5 (10%)
Q9	Injudicious use of antimicrobials shortens the duration of illness	16 (32%)	20 (40%)	14 (28%)
Q10	When you have a cough and sore throat, antimicrobials are the first drug of choice for early treatment and to prevent emergence of resistant strains	24 (48%)	14 (26%)	13 (26%)

According to this result the attitude of the 3rd[d] year students regarding antibiotic resistance is moderate.

Table 6
Distribution of data by practices variables of third year

	Question	true n(%)	false n(%)	uncertain n(%)
Q11	The Doctor prescribes a course of antibiotics for you. After taking 2–3 doses you start feeling better.			
Q 11A	Do you stop taking the further treatment?	14 (28%)	24 (48%)	12 (24%)
Q 11B	Do you save the remaining antibiotics for the next time you get sick?	9 (18%)	25 (50%)	16 (32%)
Q 11C	Do you discard the remaining, leftover medication?	10 (20%)	27 (54%)	13 (26%)
Q 11D	Do you give the leftover antibiotics to your friend/roommate if they get sick?	19 (38%)	15 (30%)	16 (32%)
Q 11E	Do you complete the full course of treatment?	40 (70%)	-----	10 (20%)
Q 12	Do you consult a doctor before starting an antibiotic?	32 (64%)	3 (8%)	15 (30%)
Q 13	Do you check the expiry date of the antibiotic before using it?	50 (100%)	----	-----
Q 14	Do you prefer to take an antibiotic when you have cough and sore throat?	14 (28%)	10 (24%)	26 (52%)

Final year students analysis

Table 7
Distribution of data by knowledge variables of final year

	Question	True n(%)	false n(%)	uncertain n(%)
Q1	Indiscriminate antimicrobial use leads to the emergence of the growing problem of resistance	50 (100%)	0	---
Q2	Antimicrobial resistance means that if they are taken too often, antimicrobials are less likely to work in the future	50 (100%)	0	----
Q3	Bacteria cause common cold and influenza	0	50 (100%)	----
Q4	Antibiotic Resistance is an important and serious global public health issue	49 (98%)	1 (2%)	----
Q5	Ineffective treatment can occur due to indiscriminate and injudicious antimicrobial use	50 (82%)	0	----

From this we can interpret that the knowledge of final MBBS year students about antibiotic resistance is excellent.

Table 8
Distribution of data by attitude variables of final year

	Question	true n(%)	false n(%)	uncertain n(%)
Q6	Antibiotics are safe drugs, hence they can be commonly used medication	47 (94%)	3 (6%)	----
Q7	Skipping one or two doses does not contribute to the development of antibiotic resistance.	6 (12%)	44 (88%)	----
Q8	Adverse effects of antimicrobials are reduced by using more than one antimicrobial at a time	4 (8%)	06 (12%)	40 (80%)
Q9	Injudicious use of antimicrobials shortens the duration of illness	12 (24%)	37 (74%)	1 (2%)
Q10	When you have a cough and sore throat, antimicrobials are the first drug of choice for early treatment and to prevent emergence of resistant strains	10 (18%)	37 (74%)	3 (6%)

According to this result the attitude of the final year students regarding antibiotic resistance is good.

Table 9
Distribution of data by practices variables of final year

	Question	yes n(%)	no n(%)	uncertain n(%)
Q11	The Doctor prescribes a course of antibiotics for you. After taking 2–3 doses you start feeling better.			
Q 11A	Do you stop taking the further treatment?	47 (94%)	1 (2%)	2 (4%)
Q 11B	Do you save the remaining antibiotics for the next time you get sick?	4 (8%)	40 (80%)	6 (12%)
Q 11C	Do you discard the remaining, leftover medication?	45 (90%)	3 (6%)	2 (4%)
Q 11D	Do you give the leftover antibiotics to your friend/roommate if they get sick?	7 (14%)	37 (74%)	6 (12%)
Q 11E	Do you complete the full course of treatment?	49 (98%)	1(2%)	0
Q 12	Do you consult a doctor before starting an antibiotic?	50 (100%)	0	0
Q 13	Do you check the expiry date of the antibiotic before using it?	43 (86%)	0	7(14%)
Q 14	Do you prefer to take an antibiotic when you have cough and sore throat?	46 (92%)	1 (2%)	3 (6%)

From these observations it can be concluded that students have a casual approach towards antibiotic use.

Comparative analysis

In Table:10 comparison of the 2nd,3rd and final year MBBS students have been done based on the variables of knowledge, attitude and practices of antibiotic resistance by applying t-test.

Table 10
T – Test for Variables of knowledge, attitude and practices of antibiotic resistance among mbbs second year,third year and final year students

Variables	p - value	result
knowledge comparison		
2nd year-3rd year	0.358	not significant
2nd year-final year*	0.010	significant*
3rd year-final year	0.180	not significant
attitude comparison		
2nd year-3rd year*	0.020	significant*
2nd year-final year*	0.030	significant*
3rd year-final year*	0.001	significant*
practices comparison		
2nd year-3rd year*	0.040	significant*
2nd year-final year*	0.003	significant*
3rd year-final year	0.737	not significant

DISCUSSION

The emergence of bacterial strains resistant to antimicrobial agents presents a growing concern worldwide. Among other factors, the irrational use of antibiotics has contributed to the progressive loss of bacterial sensitivity to antibiotics and spreading of resistant strains of bacteria, with substantial clinical and economic impact. The clinical effectiveness of antibiotics depends partially on their correct use, depending on patients, physicians and retailers. Physicians' decisions may be influenced by several factors such as the fear of losing a patient's trust, the lack of correct information on indications for antibiotic use and pressure from patients and families. Patient factors relating to incorrect antibiotic use include self-medication, sharing medication with other people, not taking a full course of treatment and keeping part of the course for another occasion. Our study assessed the knowledge, attitude and practices of the 2nd, 3rd and final year MBBS students and also compared the KAP of the students with each year. This was an IMCR- STS approved project. We found that the knowledge of 2nd year students regarding antibiotic resistance [table 1] was a little better than the 3rd year [table 4]. 94% of the 2nd year students knew that bacteria was not responsible for common cold and influenza. The improvement in knowledge of the 2nd years was mainly because of the mainstream subjects like Pharmacology and Microbiology in their curriculum in 2nd year. The knowledge of the final year in most of the questions were 100% [table 13]. The final year students [table 7] had a positive attitude towards ABR and antibiotics however the attitude of the 2nd year [table 2] and 3rd year [table 8] was found to be more casual. Practices of the final year students [table 9] were found to be more sensible, 90% of the students discard the remaining, leftover medication and about 14% of the students give the leftover antibiotics to their friend /roommate if they get sick. 98% of the students complete the full course of treatment .100% of the students consult a doctor before starting an antibiotic except for the fact that 94% of the students stop taking the further treatment once they start feeling better after taking antibiotics. Similar study conducted in past includes study conducted by Zhang et al. (2011) in China involved 2088 subjects, consisting of 1236 Medical students and 852 Nonmedical students[16]. However our study yielded better results in terms of response rates and the knowledge of our final year students. It focuses only on students of the medical field and also evaluates the gap in their KAP year wise.

CONCLUSION

Our study provides an important insight regarding the knowledge, attitudes, and practices regarding antibiotic resistance and usage among the future doctors. The study showed that quite a many students were aware of antibiotic resistance, though disturbing was their attitude regarding it. The medical students need to given training sessions to improve their understanding about antibiotic resistance. It will also help to plan for an effective undergraduate curriculum and the need for educational strategies to be developed in order to enable students to reflect on knowledge of antibiotics.

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AUTHORS CONTRIBUTION STATEMENT

Dr Yadav, and Dr Afnan conceptualized and gathered the data with regard to this work. Dr Deolekar P and Dr Syed A, analyzed these data and necessary inputs were by K Istuti, N Sharma, and Suri R towards the designing of the manuscript. All authors discussed the methodology and results and contributed to the final manuscript.

CONFLICT OF INTEREST

Conflict of interest declared none.

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