

Assessment of knowledge, attitude and practice of antimicrobial usage and resistance among the medical undergraduates

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Abstract

Introduction: The menace of antimicrobial abuse and resistance has enveloped the entire world. As the medical students are the future prescribers so their knowledge and attitude in relation to public usage of antimicrobials and rational prescription of antimicrobials will make them important fighters against antimicrobial resistance. Hence the present study was designed and undertaken with an objective to determine the knowledge, attitude and practice of medical undergraduates on usage of antimicrobials and antimicrobial resistance.

Materials and Methods: A cross-sectional questionnaire based observational study was conducted among the undergraduates from 4th to 9th semester of MBBS. A total of 350 students were enrolled in the study and they were required to fill up the questionnaire which contained questions regarding knowledge, attitude and practice of antimicrobial usage and antimicrobial resistance.

Results: Majority of the students (96.57%) were aware of the fact that antimicrobial resistance is a serious global public health issue. Only 9.41% felt the need of antimicrobials to treat common cold, while as (95.71%) students realised the importance of antimicrobial policy in the hospital to achieve rational antimicrobial usage. Only half of the students always consulted a doctor before starting an antimicrobial agent.

Conclusion: The knowledge of the students regarding antimicrobials was adequate, though the attitude was little lax towards it. They seemed to be a bit perplexed about the use of antimicrobials on themselves. Appropriate educational interventions and strategies can be introduced to tackle this weak aspect of our students.

Keywords: Antimicrobial use, Antimicrobial resistance, Medical undergraduates, Knowledge, Attitude, Practice.

Introduction

Antimicrobial agents are the greatest contribution of the 20th century to therapeutics. Across the globe, they are one of the most commonly used as well as misused drugs.¹ The rampant use of antimicrobial agents has resulted in bacterial resistance, treatment failures and hence additional cost to therapy.² The menace of antimicrobial resistance has enveloped the entire world, that World Health Organisation (WHO) in 2011 set the theme of World Health Day as "Combat Antimicrobial Resistance: No Action Today, No cure Tomorrow".³ Every country is facing the challenge of antimicrobial resistant "super bugs". The world is heading towards a post-antibiotic era.⁴

The problem of antimicrobial resistance is multifold in developing countries due to inappropriate and irrational use of antimicrobial agents. As there is a strong correlation between the levels of antimicrobial use and antimicrobial resistance, shown in various studies, where population who use lower amount of antimicrobial agents develop less resistance towards microorganisms. Various approaches have been developed to meet the challenges of antimicrobial resistance; the first step towards curtailing the progress of antimicrobial resistance is to develop awareness on its significance and seriousness. One of the approaches is to undertake various institutional and educational campaigns among the general population and health care personnel regarding antimicrobial resistance, its consequences, complications and the steps required to limit its development and spread.^{5,6,7} In India, to curb this menace of antimicrobial resistance, a national antibiotic policy has been developed, national surveillance database for antibiotic

use has been established and National Centre for Disease Control (NCDC) is designated as the focal point for antimicrobial resistance in the country.

However, something more specific requires to be done at individual level which would affect health related behaviour.⁸ Increasing the awareness of individuals connected with antimicrobial use can ensure the rational use of antimicrobial agents. The knowledge of healthcare professionals regarding antimicrobial resistance and their role to create awareness amongst patients in relation to antimicrobial usage plays a critical role in combating antimicrobial resistance.⁹ Since, the medical students are the future prescribers so their knowledge, attitude and behaviour in relation to usage of antimicrobial agents and rational prescription of antimicrobial agents makes them important fighters against antimicrobial resistance. But there is sufficient evidence which indicates that the newly licensed doctors are inadequately trained to prescribe medications safely.¹⁰ Insufficient education of graduate and postgraduate students in rational prescription has been identified as one of the contributory factor.¹¹ By providing comprehensive knowledge on antimicrobial resistance to medical undergraduate students is one way of tackling this problem. Hence it is important to bridge the gap in knowledge of medical students regarding antimicrobial use in order to improve their prescribing practice. Although knowledge plays a key role in providing an insight into the problem faced, but at the same time it is the attitude and beliefs that also play a pivotal role in directing the desired behavioural change. The ultimate aim is to bring out attitude and behavioural changes at the elementary level. Hence by

strengthening the foundation of healthcare system (medical undergraduates) one would be able to tackle the issue of antimicrobial resistance.

Hence the present study was undertaken with an objective to determine the knowledge, attitude and practice of medical undergraduates on usage of antimicrobial agents and antimicrobial resistance.

Materials and Methods

A cross sectional questionnaire based observational study was conducted in Acharya Shri Chander College of Medical Sciences (ASCOMS) and Hospital, Jammu, over a period of three months, January to March 2019. Institutional Ethical Committee approval was taken before the commencement of the study. 350 medical undergraduates studying in 4th to 9th semester participated in the study. Nearly all the students voluntarily participated in the survey after being briefed in detail about the goals and methods of the study. Students who were not willing to participate in the study or were absent on the day of the study were excluded. The survey was anonymous and all obtained data was kept confidential. The questionnaire was developed after a literature review of comparable studies,^{2,12,13} and was validated by conducting a pilot study on a sample of 20 medical undergraduates, who were finally excluded from the study. The questionnaire was given to different batch students on different days and they were instructed to fill the questionnaire within the stipulated time of 30 minutes.

The questionnaire was divided into five sections. The first section of the questionnaire included demographic information of the students (age, gender, 4th/5th/6th/7th/8th/9th semester). The second section of the questionnaire contained eight questions and assessed the students' knowledge about antimicrobial usage and antimicrobial resistance. The students' knowledge was assessed by using a set of true, false or uncertain questions and result was tabulated in percentage.

The third section of the questionnaire contained twelve questions and assessed the attitude of the students regarding antimicrobial use and resistance. They were analysed by using a 5 point Likert scale, whose responses ranged from 'strongly agree' to 'strongly disagree' and result was tabulated in percentage.

The fourth section of the questionnaire contained five questions related to their self reported practices regarding use of antimicrobial agents. They too were assessed by using a Likert scale which ranged from 'always' to 'never' and the result was again tabulated in percentage.

In order to simplify the analysis, 5 point response options of the Likert scale, was reduced to three, such as true/false/uncertain, agree/disagree/not sure. The possible answers 'strongly agree' and 'agree' were considered as 'positive' answer, while the possible answers 'disagree' and 'strongly disagree' were considered as a negative answer and remaining were uncertain. The possible answers 'always' and 'usually' were considered as a 'certain', while the possible answers 'never' were considered as a 'no'

answer and possible answers 'sometime' were considered as 'uncertain'.

In the fifth section of the questionnaire, the participants were asked an open ended question to give solutions to curb the growing problem of antimicrobial resistance.

Results

350 medical undergraduates (studying in 4th to 9th semester) participated in the study, out of which 214 (61.4%) were male students and 136 (38.85%) were female students. They were all in the age group between 19 to 24 years. (Table 1) Knowledge: A set of eight questions assessed the knowledge of students regarding the use of antimicrobial agents and resistance. (Table 2)

338(96.57%) students believed that antimicrobial resistance is a serious global health issue, whereas 6(1.7%) did not consider it as a serious issue and same number of students were uncertain about it. 288(82.28%) students believed that antimicrobial agents were not required in patients with common cold, while 32(9.14%) students considered antimicrobial agents were required, whereas 30(8.57%) students were unclear about it. 324(92.57%) students were aware of the fact that antimicrobial agents did not cure viral infections, whereas 18(5.14%) considered it otherwise and remaining 8(2.28%) remained indecisive. 243(69.42%) students did not agree with the statement, that efficacy of antimicrobial agents is better in case of newer and costlier antimicrobial agents, whereas 39(11.14%) students agreed with this statement and 68(19.42%) remained doubtful about it. 229(65.42%) students were of the view that antimicrobial agents speed up the recovery, while 61(17.42%) students did not agree with it and 60(17.14%) remained unsure. 342(97.71%) students agreed to the fact that indiscriminate use of antimicrobial agents led to antimicrobial resistance, whereas only 2(0.57%) disagreed and 6(1.71%) remained inconclusive. 299(85.42%) were of the opinion that frequent use of antimicrobial agents would lead to their failure to be effective in the future, whereas 43(12.28%) disapproved of this and 8(2.28%) remained neutral. 331(94.57%) students were affirmative with the statement that ineffective treatment could occur due to indiscriminate and injudicious use of antimicrobial agents, whereas 10(2.85%) students did not agree with it and remaining 9(2.57%) students remained indecisive.

Attitude

A set of twelve questions assessed the attitude of the students regarding use of antimicrobial agents and its resistance. (Table 3)

In our study only 64(18.28%) students agreed that antimicrobial agents are safe and can be used commonly, while 232(66.28%) disagreed and 54(15.42%) remained inconclusive. Only 81(23.14%) students agreed that skipping one or two doses does not contribute to the development of antimicrobial resistance whereas 208(59.42%) disagreed and 61(17.42%) were indecisive. 82(23.42%) participants were affirmative that adverse

effects of antimicrobial agents are reduced by using more than one antimicrobial agent at a time, whereas 189(54%) disapproved and 79(22.57%) were unsure. Only 24(6.85%) participants believed that injudicious use of antimicrobial agents shortens the duration of illness, whereas 300(85.71%) disapproved and 26(7.42%) remained unclear. 126(36%) participants agreed that antimicrobial agents are the first drug of choice for early treatment of cough and sore throat in order to prevent the emergence of resistant strains, whereas 194(55.42%) disagreed and 30(8.57%) remained doubtful. 277(79.14%) participants agreed that it is important to obtain culture and sensitivity report of antimicrobials agents, whereas 34(9.71%) disagreed and 39(11.14%) remained uncertain about it. 332(94.85%) students agreed that a course on 'Rational use of Antimicrobial Agents' should be included in the curriculum, whereas 15(4.28%) disagreed and only 3(0.85%) were unsure. Most of the students 335(95.71%) agreed that an antimicrobial policy would be helpful to achieve rational antimicrobial usage, whereas only 4(1.42%) disagreed and 11(3.14%) remained inconclusive. 190(54.28%) were affirmative that antimicrobial use affects the family health, while 86(24.57%) differed in their opinion and 74(21.14%) remained indecisive. Large number of students, 300 (85.71%) unanimously agreed that antimicrobial abuse is rampant in the society, whereas 18(5.14%) disapproved and 32(9.41%) were unsure. Majority of the students, 305(87.14%) were worried about the side effects of antimicrobial agents, while 22(6.28%) were not worried and 23(6.57%) doubtful. Many of the students, 333(95.14%) stated they would consult a doctor for the treatment of side effects of antimicrobials agents, while only 5(1.42%) disagreed to do so and the remaining 12(3.42%) were confused about it.

Practice

A set of five questions assessed their self reported practices regarding the use of antimicrobial agents. (Table 4)

A number of questions were asked to the participants regarding the use of antimicrobial agents, which were prescribed to them by a physician. In the first question it was enquired whether the students stopped taking the prescribed antimicrobial agents when they felt good after taking 2 to 3 doses. 27(7.71%) always stopped, whereas 126(36%) sometimes stopped & 197(56.28%) never interrupted the medication midway. When asked whether they saved these antimicrobial agents for future use, 62(17.71%) always saved, whereas 141 (40.28%) sometimes saved and 147(42%) never kept leftover medication for the future. Similarly, when asked whether they discarded the leftover medicines, only 45(12.85%) always discarded, whereas 114(32.57%) sometimes discarded and 191(54.57%) never discarded the leftover medicines. 44(12.57%) students always handed over the leftover medicines to their sick friend/family member, whereas 172 (49.14%) students sometimes gave their friend/

family member leftover medicines but 134(38.28%) never indulged in this practice. A large number of students 245 (70%) always completed the full course of treatment, whereas 96(27.42%) sometimes completed and handful of students 9 (2.57%) never completed the full course of treatment. 177(50.57%) of participants always consulted a doctor before starting with an antimicrobial agent, whereas 160 (45.71%) sometimes consulted and 13(3.71%) never consulted a doctor before starting with an antimicrobial agent. Maximum number of students 339 (96.85%) always checked the expiry date before using the antimicrobial agent, whereas only 7(2%) sometimes checked and only a handful 4(1.14%) never checked the expiry date. Only 45(12.85%) students always preferred to take an antimicrobial agent when they had a cough and sore throat, whereas 229(65.42%) sometimes took medication for it and 76(21.71%) never took antimicrobial agents for cough and sore throat. Very few students 22(6.28%) said that they would always ask the doctor to prescribe antimicrobial agents to them when they get common cold, while 111(31.71%) would sometimes do so and majority of the students 217(62%) would never request the doctor to prescribe the same to them for common cold.

In the fifth and last section of the questionnaire the students were asked an open ended question to give solutions to curb the growing menace of antimicrobial resistance. (Fig. 1)

131(37.42%) students were of the opinion that judicious, careful and rational use of medicines is the best way to tackle the problem of antimicrobial resistance. Avoidance of self medication and consultation with the doctor was observed by 62(17.71%) students as a good step to restrain antimicrobial resistance. Completion of full course of antimicrobial agents seemed to be right step towards combating resistance was reported by 51(14.57%) students. 37(10.57%) participants believed that by creating awareness among patients by organising public health campaigns one can decrease antimicrobial resistance. Prescribing antimicrobial agents by using culture sensitivity reports was vouched by 32(9.14%) students as a step to restrict antimicrobial resistance. Symptomatic management in self limiting conditions was favoured by 13(3.71%) students as a beneficial step in reduction of antimicrobial resistance. Multidrug therapy was considered as a tool to offset antimicrobial resistance by 9(2.57%) students. Discovery of new drugs was contemplated by 8(2.28%) students to tackle antimicrobial resistance. 5(1.42%) students expressed independent views to restrict antimicrobial resistance which ranged from evidence based treatment to complete ban on over the counter availability of antimicrobial agents as well as availability of antimicrobial agents on subsidised rates. Only 2 students did not approve of any of the suggestion on steps to be taken against the development of antimicrobial resistance.

Table 1: Age distribution of students

S. No	Age (Years)	Number of Respondents	Percentage
1	19	33	9.42%
2	20	69	19.71%
3	21	91	26%
4	22	72	20.57%
5	23	71	20.28%
6	24	14	4%

Table 2: Knowledge of respondent's regarding antimicrobial use & resistance

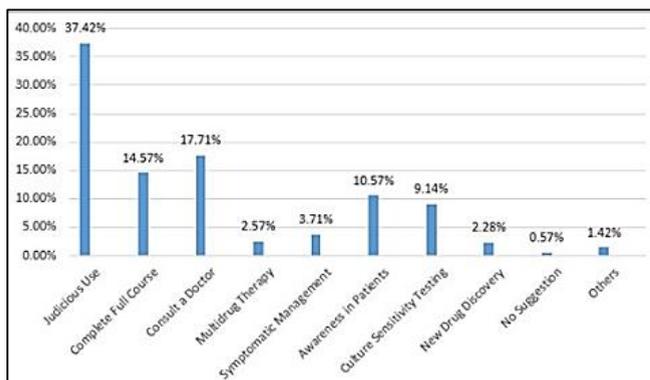
S No.	Statement	True n (%)	False n (%)	Uncertain n(%)
1	Antimicrobial Resistance is an important and serious global public health issue	338(96.57%)	6(1.71%)	6(1.71%)
2	Patients with common cold need Antimicrobials	32(9.14%)	288 (82.28%)	30(8.57%)
3	Antibiotics cure viral infections	18(5.14%)	324 (92.57%)	8(2.28%)
4	The efficacy is better if the Antimicrobials are newer and more costly	39(11.14%)	243 (69.42%)	68(19.42%)
5	Use of Antimicrobials speeds up the recovery	229(65.42%)	61 (17.42%)	60(17.14%)
6	Indiscriminate Antimicrobial use leads to the emergence of the growing problem of Resistance	342(97.71%)	2 (0.57%)	6(1.71%)
7	Antimicrobial Resistance means that if they are taken too often, Antimicrobials are less likely to work in the future	299(85.42%)	43(12.28%)	8(2.28%)
8	Ineffective Treatment can occur due to indiscriminate &injudicious Antimicrobial use	331(94.57%)	10(2.85%)	9(2.57%)

Table 3: Attitude of respondents regarding antimicrobial use & resistance

S. No.	Statement	Agree n (%)	Disagree n (%)	Not Sure n (%)
1	Antimicrobials are safe drugs, hence they can be commonly used medication	64(18.28%)	232(66.28%)	54(15.42%)
2	Skipping one or two doses does not contribute to the development of Antimicrobial resistance	81(23.14%)	208(59.42%)	61(17.42%)
3	Adverse effects of Antimicrobials are reduced by using more than one Antimicrobial at a time	82(23.42%)	189(54%)	79(22.57%)
4	Injudicious use of Antimicrobials shortens the duration of illness	24(6.85%)	300(85.71%)	26(7.42%)
5	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	126(36%)	194(55.42%)	30(8.57%)
6	It is important to obtain culture and sensitivity report for Antimicrobial prescription	277(79.14%)	34(9.71%)	39(11.14%)
7	There is a need to establish Course on "Rational Use of Antimicrobials" in the Curriculum	332(94.85%)	15(4.28%)	3(0.85%)
8	An Antimicrobial Policy in a hospital is helpful to achieve Rational Antimicrobial usage	335(95.71%)	4(1.14%)	11(3.14%)
9	The Antimicrobial use affects the family health	190(54.28%)	86(24.57%)	74(21.14%)
10	Antimicrobial abuse is rampant in the society	300 (85.71%)	18(5.14%)	32(9.14%)
11	Worried about side effects of Antimicrobials	305 (87.14%)	22(6.28%)	23(6.57%)
12	Consult the Doctor for the treatment of side effects of Antimicrobials	333 (95.14%)	5(1.42%)	12(3.42%)

Table 4: Practice of respondents regarding antimicrobial use

Q. No	Question	Always n (%)	Sometimes n (%)	Never n (%)
1	The doctor prescribes a course of Antimicrobial for you. After taking 2 to 3 doses, you start feeling better			
a)	Do you stop taking further treatment	27 (7.71%)	126 (36%)	197 (56.28%)
b)	Do you save the remaining Antimicrobials for the next time you get sick?	62 (17.71%)	141 (40.28%)	147 (42%)
c)	Do you discard the remaining leftover medication?	45 (12.85%)	114 (32.57%)	191 (54.57%)
d)	Do you give the leftover Antimicrobial to your friend /family member if they get sick?	44 (12.57%)	172 (49.14%)	134 (38.28%)
e)	Do you complete the full course of treatment?	245 (70%)	96 (27.42%)	9 (2.57%)
2	Do you consult a doctor before starting an Antimicrobial?	177 (50.57%)	160 (45.71%)	13 (3.71%)
3	Do you check the expiry date of the Antimicrobial before using it?	339 (96.85%)	7 (2%)	4 (1.14%)
4	Do you prefer to take an Antimicrobial when you have cough and sore throat?	45 (12.85%)	229 (65.42%)	76 (21.71%)
5	Will you ask the doctor to prescribe Antimicrobials for you when you catch common cold?	22 (6.28%)	111 (31.71%)	217 (62%)

**Fig. 1:** Suggestion from respondents to overcome antimicrobial resistance problem

Discussion

The present study gives an insight into knowledge, attitude and practice of antimicrobial agents use and its resistance among medical undergraduates of our Institution. A total of 350 students from 4th to 9th semester, participated in this cross sectional study.

Majority of the students (96.57%) in our study were aware of the fact that antimicrobial resistance is a serious global public health issue and is mainly caused by its indiscriminate use (97.71%) which is in alignment with

various studies conducted on medical undergraduates¹²⁻¹⁴ and on interns.² But other studies showed that lesser number of participants believed that indiscriminate use of antimicrobials led to antimicrobial resistance.^{5,7}

Significant number of our students (82.28%) were aware of the fact that antimicrobial agents were not required in common cold. Similar results were documented in other studies^{13,15} as well. Whereas, only 48.2% and 63% participants respectively believed that antimicrobial agents were not required in common cold in other studies.^{16,2}

Large number of our students (92.57%) were aware that antibiotics did not cure viral infections. Comparable results were observed in other studies.^{10,13,17} While smaller number of participants, in the range of 69.3% to 75%, were aware of this fact as concluded in other studies.^{2,5,16}

However, there were certain areas where the knowledge of our students was average, as only 69.42% students were aware of the fact that newer and costlier antimicrobial agents do not necessarily have better efficacy. These findings are in concurrence with other studies done on undergraduates.^{7,13} In contrast, the knowledge of interns and postgraduates was much better in this aspect in various studies.^{2,7}

Despite, fairly good level of knowledge about antimicrobial use and resistance, seen in our students, their little careless attitude towards antimicrobial usage was evident. Only 59.42% students answered correctly that

skipping 1 or 2 doses of antimicrobial agents contributed to development of antimicrobial resistance. Comparable results were seen in various studies.^{5,7} However, very less number of students, in the range of 41% to 47% were able give a correct answer in some studies.^{8,15,18}

In our study, there were some students (23.42%) who were of the wrong opinion that adverse drug reactions of antimicrobial agents are reduced by using more than one antimicrobial agent. Analogous results were seen in 29% and 19.9% students respectively in two other studies.^{16,2} But a more casual attitude of the students was observed in some studies where nearly half the number of students held a similar wrong opinion about antimicrobials agents.^{12,15}

In the present study, 36% of students had a misconception that antimicrobial agents were the first drug of choice for early treatment of cough and sore throat. Similar misconception was seen in 23.2% students in another study.¹⁰ More than half the number of students held a similar perception about antimicrobial agents in various other studies.^{12,14}

The attitude of our students was positive towards developing antimicrobial policy in the hospital, where 95.71% students strongly vouched for it and 94.85% students were in support for the establishment of "Rational use of Antimicrobial Agents" course in the curriculum. These results are in congruence with the study,² where 97.5% and 94.9% students unanimously agreed upon these two important points.

Positive attitude of our students was evident from the fact that majority of them (79.14%) realised the importance of culture and sensitivity tests. Similar attitude was seen in 82.5% students, in another study.² While less than half the number students realised the importance of culture and sensitivity tests in a different study.¹⁵

Majority of the students (85.7%) agreed to the fact that antimicrobial abuse was rampant in the society. Similar result was seen in another study.¹³

Despite, a little casual attitude of the students, the self reported practice with regard to use of antimicrobials agents was found to be satisfactory in certain aspects and a little disturbing in other aspects. While majority of the students (70%) always completed the full course of antimicrobials agents prescribed to them by a doctor which is in accordance with other studies.^{8,13,18} On the other hand, more than 90% of participants completed the full course of antimicrobial agents in certain studies.^{12,14} Contrary to this, only 32% medical undergraduates always completed antimicrobial course in a study conducted in Lahore.¹⁹

Maximum number of students (96.85%) always checked the expiry date of antimicrobial agents before using it. This result is in alignment with various studies, where more than 90% participants checked the expiry date of antimicrobials agents.^{12,13,15,16} On the contrary, one study reported that only 58% second year medical undergraduates always checked the expiry date of antimicrobial agents.¹⁴

A daunting aspect of our study is that only half of the students always consulted a doctor before starting an antimicrobial agent. Similar practice has been reported in

other studies too.^{10,14} Meanwhile some studies reported that more than 90% students consulted a doctor before taking antimicrobial agents.^{12,15,18}

Another disturbing aspect seen in the present study, regarding the left over antimicrobial agents, was that 54.57% students never discarded the left over medicines. Analogous results have also been reported in various studies.^{10,16} In contrast, some studies have shown that only one third of the participants kept the left over medicines.^{5,15}

One more alarming aspect observed in our study, regarding left over antimicrobial agents, was that 12.57% of students always handed them over to friend/family member for their further use. Our result is in sync with other studies.^{14,19} Contradictory to our study, other studies have reported this practice in nearly one third of the participants.^{8,12,13}

Students in the present study put forth various solutions to combat antimicrobial resistance. Large number of students 37.42% favoured judicious, careful and rational use of medicines as the main tool to tackle antimicrobial resistance which is in alignment with other studies.^{12,13}

Importance of consultation with a doctor and emphasis on completion of antimicrobial course was put forth by 17.71% and 14.47% students respectively, as methods to curb antimicrobial resistance in the present study. Comparable results are seen in another study.¹² While less number of students (4.5% and 6.5%) respectively realised the importance of this in a study conducted in Kerala.¹³

Awareness campaigns for patients was too seen as a modus operandi to restrain antimicrobial resistance by 10.57% students in our study. While lesser number of students (5.81% and 4.50%) respectively regarded it as a useful tool to restrict antimicrobial resistance in other studies.^{12,13} Whereas, relevance of culture sensitivity tests was considered by 9.14% students as an important method to constrain antimicrobial resistance in the present study, while much lesser number of students (3.48% and 0.9%) respectively showed alike thinking in other studies.^{12,13}

In our study, despite having a fair knowledge about antimicrobial use and resistance, students showed a little casual attitude towards it. Although they were aware of rampant abuse of antimicrobial agents and showed positive attitude towards implementation of antimicrobial policy and rational use of antimicrobial agents in curriculum, but their attitude towards their personal choices regarding the use of antimicrobial agents was baffling. As a good number of students still regarded antimicrobial agents as first drug of choice for early treatment of cough and sore throat and were not aware of the fact that skipping of one or two doses led to development of antimicrobial resistance. While the self reported practices in relation to use of antimicrobials agents was good in certain aspects like nearly all the students checked the expiry date of the antimicrobial agents before use and good number of them completed the full course of treatment of antimicrobial agents. But it was disturbing in other aspects like only half the number of students consulted a doctor before taking antimicrobial agents and good number of them gave their left over antimicrobial agents to

friend/family member. Our students were forthcoming in giving suggestions to constrain antimicrobial resistance, like they emphasised on rational use of medicines, completion of full course of antimicrobial agents and importance of culture sensitivity tests, which implicated that they had good knowledge about antimicrobial agents.

Conclusion

Our study underlines the fact that the knowledge of the students of our Institution regarding antimicrobial agents is good and satisfactory. But it is daunting to find a casual attitude of students towards it especially in their personal choices regarding the use of antimicrobial agents. Although they seem to have unanimous view regarding the implementation of rational use of antimicrobial agents and antimicrobial policy in the hospitals. Our students seem to be a bit perplexed about their practice of antimicrobial agents, as many of them completed their full course of treatment of antimicrobial agents but a good number gave their left over antimicrobial agents to their friend/family member.

Hence, there is an urgent need for improvement regarding the attitude and practice of our students towards antimicrobial agents. Since the medical undergraduates are the future healthcare providers, hence it is prudent to work on this aspect, by adopting appropriate educational interventions and strategies to tackle this weak aspect of our students, that would go a long way in shaping the mindset of these future prescribers and ultimately leading to rational use of antimicrobial agents in letter and spirit, which is the main weapon to combat antimicrobial resistance.

As our study includes only students of our Institution and antimicrobial resistance has spread its tentacles across the globe, multicentric studies are the need of hour to evaluate the knowledge, attitude and practice of antimicrobial use and antimicrobial resistance involving wider section of medical undergraduates across various medical colleges in the country. This will provide an insight into the minds of the future prescribers and help in fighting antimicrobial abuse and antimicrobial resistance in the long run.

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None.

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