

Original Research Article

Knowledge, attitude and practice study about antibiotics usage among medical undergraduates of a tertiary care teaching hospital of Haryana, India: an observational cross-sectional study

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ABSTRACT

Background: Antibiotic resistance (ABR) has now become a global health problem. It has significantly increased the mortality and morbidity related to infectious diseases as well as the economic burden due to these infections. There is global consensus on development of new strategies for prevention of antibiotic abuse and hence decreasing the prevalence of ABR. Medical students should be given more education during their undergraduate training regarding antibiotic resistance and appropriate prescribing. Therefore, this study was planned to assess Knowledge, attitude and practice (KAP) about antibiotics usage among medical undergraduates.

Methods: An observational cross-sectional study was done among 2nd year undergraduate medical students of NC Medical College and Hospital, Israna, Panipat. Data was collected through specifically developed structured questionnaire from 130 students. The data was entered in MS excel 2010 and statistical analysis was done using MS excel 2010 and IBM Statistical package for social sciences (SPSS) version 20.0.0.

Results: 93.07% (n=121) of the students were aware that antibiotic resistance has become an important and serious global public health issue. The attitude of the students about antibiotic use and resistance was found to be casual and negligent. 21.53% (n=28) of study participants believed that they should take antibiotics when they have cold to prevent from getting a serious illness. 38.46% (n=50) of students considered taking antibiotics whenever they had fever.

Conclusions: This study provides useful information about the knowledge, attitudes and the practices of 2nd year undergraduate medical students about antibiotic resistance and usage.

Keywords: Antibiotics, Antibiotic resistance, Undergraduates

INTRODUCTION

Antibiotics are probably one of the most successful forms of chemotherapy in the history of medicine. Their use has significantly reduced the mortality and morbidity associated with infectious disease. The beginning of the modern “antibiotic era” started with the discoveries of Paul Ehrlich and Alexander Fleming.¹ Penicillin discovered by Fleming was called as “wonder drug” because of lives it saved after its discovery.² In early 1945, Fleming predicted that the high public demand of antibiotics would determine

an “era of abuse”, which eventually became a reality.^{3,4} The overuse of antibiotics clearly drives the evolution of resistance. Epidemiological studies have demonstrated a direct relationship between antibiotic consumption and the emergence and dissemination of resistant bacteria strains.⁵⁻¹¹

Antibiotic resistance (ABR) has now become a global health problem. It has significantly increased the mortality and morbidity related to infectious diseases as well as the economic burden due to these types of infections.¹² There

is global consensus on development of new strategies for prevention of antibiotic abuse and hence decreasing the prevalence of ABR. One of the most important strategies is to educate general population as well as health care personnel about antibiotic abuse. WHO states that all healthcare workers and medical students should be educated on rational antimicrobial prescribing or “Antimicrobial stewardship” and this is an integral part of ABR containment activities.^{13,14}

Medical students should be given more education during their undergraduate training regarding antibiotic resistance and appropriate prescribing. This is a crucial time period during which the importance of these issues should be emphasized, because once the doctors become qualified, it is difficult to change their deeply entrenched views and behaviour.¹⁵ Before strengthening any training program for any group, it is advised to be aware about knowledge, attitude and practices of that group. As medical students are taught about antibiotic usage and resistance during 2nd year of their curriculum, this study was planned with the objective to assess the knowledge, attitudes and the practices of 2nd year medical students about antibiotic usage.

METHODS

The present study was questionnaire based cross-sectional study conducted among 2nd year undergraduate medical students from tertiary care teaching hospital (Israna, Panipat, Haryana) after taking clearance from institutional ethics committee. All students were informed about the objectives of the study. A total of 130 students agreed to voluntarily participate and those who were not willing to participate in the study were excluded. The study was conducted during a period of two weeks from 5 to 20 May, 2021.

Data were collected through specifically developed structured questionnaire, which was developed based on the literature review of comparable studies.¹⁶⁻¹⁸ The questionnaire was validated by subject experts for its

content and relevance. Before the commencement of main study, a small-scale pilot study was conducted among small number of students using the structured questionnaire. Based on the pilot study outcome, the questionnaire was further modified and improved.

The Institutional Ethics Committee permission was taken prior to initiation of the study. Each participant was allotted 20 minutes to answer the questionnaire. They were asked to complete the questionnaire anonymously. Informed consent was also obtained from the participants, to utilise their data for research purposes. The questionnaire was divided in three parts, assessing the participants’ knowledge, attitude and practice respectively. The participants’ knowledge was assessed by using a set of ‘yes’ and ‘no’ questions. Attitude was analyzed by using a 5-point Likert scale, whose responses ranged from ‘strongly agree’ to ‘strongly disagree’. The participants’ practice of antibiotic use was assessed by using a Likert scale which ranged from ‘always’ to ‘never’.

For simplifying the analysis, we reduced the five point response options of the Likert scale into three scale agree/disagree/uncertain and yes/no/uncertain for Attitude and Practice assessment respectively. The possible answers “strongly agree” and “agree” were considered as a “agree” answer, while the possible answers “disagree” and “strongly disagree” were considered as a “disagree” answer and remaining were uncertain. The possible answers “always” and “usually” were considered as a “yes” answer, while the possible answers “seldom” and “never” were considered as a “no” answer and possible answers “sometimes” were labeled as same. The results were tabulated as percentages.

RESULTS

The response rate was 100 percent among the 130 medical students who volunteered to participate in the study. The results are tabulated as percentages in Table 1, Table 2 and Table 3.

Table 1: Questionnaire to assess knowledge.

Q. no.	Question	True N (%)	False N (%)	Uncertain N (%)
1.	Antibiotics can be used to cure infections caused by bacteria	130 (100)	0 (0)	-
2.	Antibiotics can be used to cure infections caused by viruses	5 (3.84)	120 (92.30)	5 (3.84)
3.	Bacteria can cause common cold and influenza	10 (7.69)	112 (86.15)	8 (6.15)
4.	Use of antibiotics will speed up the recovery of common cold and cough	21 (16.15)	100 (76.92)	9 (6.92)
5.	Indiscriminate antibiotics use can lead to the emergence of the antibiotic resistance	122 (93.84)	2 (1.53)	6 (4.61)
6.	Antibiotic Resistance has become an important and serious global public health issue	121 (93.07)	3 (2.30)	6 (4.61)

Table 2: Questionnaire to assess attitude.

Q. no.	Question	Agree N (%)	Disagree N (%)	Uncertain N (%)
1.	When you have a cold, you should take antibiotics to prevent getting a more serious illness	28 (21.53)	90 (69.23)	12 (9.23)
2.	When you get fever, antibiotics help you to get better more quickly	50 (38.46)	60 (46.15)	20 (15.38)
3.	When you have a cough and sore throat, antibiotics are the first drug of choice for early treatment and to prevent emergence of resistant strains	46 (35.38)	62 (47.69)	22 (16.92)
4.	Skipping one or two doses does not contribute to the development of antibiotic resistance	39 (30.00)	73 (56.15)	18 (13.84)
5.	Antibiotics are safe drugs; hence they can be commonly used.	43 (33.07)	80 (61.53)	7 (5.38)
6.	Antibiotic Resistance leads to additional burden of medical cost to the patient	77 (59.23)	45 (34.61)	8 (6.15)

Table 3: Questionnaire to assess practice.

Q. no.	Question	Yes N (%)	No N (%)	Sometimes N (%)
1.	The doctor prescribes a course of antibiotic for you. After taking 2–3 doses you start feeling better			
(a)	Do you complete the full course of treatment?	90 (69.23)	22 (16.92)	18 (13.84)
(b)	Do you save the remaining antibiotics for the next time you get sick?	20 (15.38)	88 (67.69)	22 (16.92)
(c)	Do you discard the remaining, leftover medication?	42 (32.30)	53 (40.76)	35 (26.92)
(d)	Do you give the leftover antibiotics to your friend/roommate if they get sick?	25 (19.23)	83 (63.84)	22 (16.92)
2.	Do you consult a doctor before starting an antibiotic?	110 (84.61)	12 (9.23)	8 (6.15)
3.	Do you check the expiry date of the antibiotic before using it?	121 (93.07)	5 (3.84)	4 (3.07)
4.	Do you prefer to take an antibiotic when you have cold and sore throat?	26 (20.00)	74 (56.92)	30 (23.07)

Out of study participants, 93.07% (n=121) of the students were aware that antibiotic resistance has become an important and serious global public health issue and about same no. of participants (93.84%, n=122) agreed that indiscriminate antimicrobial use can lead to the emergence of the antibiotic resistance. All of the students were aware that antibiotics can be used to cure infections caused by bacteria but 7.69% of students were not aware that common cold and influenza were not caused by the bacteria.

However, the attitude of the students about antibiotic use and resistance was found to be casual and negligent. 21.53% (n=28) of study participants believed that they should take antibiotics when they have cold to prevent from getting a serious illness. 38.46% (n=50) of students considered taking antibiotics whenever they had fever. 30.00% (n=39) of participants thought that skipping one or two doses of antibiotics did not contribute to development of antibiotics resistance. 43 participants (33.07%) thought that antibiotics were safe drugs and hence could be used commonly used.

Majority of students (84.61%) however consulted a doctor before taking antibiotics and majority of them completed full course of antibiotics. Most of the study participants (93.07%) always checked the expiry date of antibiotics before taking them.

DISCUSSION

This study provides useful information about the knowledge, attitudes and the practices of 2nd year undergraduate medical students about antibiotic resistance and usage.

The emergence of antibiotics resistance is a growing problem worldwide.¹⁹ Irrational use of antibiotics leads to progressive loss of bacterial sensitivity to antibiotics resulting in antibiotics resistance causing various clinical and economic impacts.²⁰

WHO has also highlighted the irrational use of antibiotics as public health problem. WHO even set the theme of

World Health Day as 'Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow'.^{21,22} India has also recognized the problem of Antibiotics Resistance (ABR) and Government of India launched "National Programme on Containment of Antimicrobial Resistance" under the 12th five year plan (2012-2017). The main objectives of this programme are to establish a laboratory based AMR surveillance system of 30 network labs in the country and to generate quality data on antimicrobial resistance for pathogens of public health importance, to strengthen infection control guidelines and practices and promote rationale use of antibiotics and to generate awareness among healthcare providers and in the community about rationale use of antibiotics.²³

Majority of students in our study had fair knowledge about use of antibiotics, irrational use of antibiotics leading to resistance and ABR becoming an important and serious global public health issue. Similar response was noted in previous studies.²⁴⁻²⁶

The current study demonstrated that students' attitude was casual and non-serious compared to their level of knowledge. 21.53% of study participants thought that antibiotics should be used to prevent getting a serious illness in common cold and 35.38% of them said to use antibiotics as first drug of choice in case of cold and sore throat. 30.00% of students thought that skipping one or two doses did not contribute to the development of antibiotic resistance. Similar results were seen in previous studies.^{24,27-28}

The self reported practices of study participants with regards to antibiotics use were found to be satisfactory, in contrast to the casual attitude. Majority of study participants consulted a doctor before starting an antibiotic and majority of them completed the full course of treatment. Similar results were seen in previous studies.²⁴⁻²⁸ Self medication practice among medical students was found to be more prevalent in some similar previous studies.²⁹⁻³¹ Another similar study stated that more than 60 % of the participants thought that antibiotics should be prescribed for viral illnesses assuming bacterial etiology.³² Such wrong beliefs cause high rates of antibiotics consumption, leading to antibiotics resistance.³³ But in our study, majority of the participants were aware that diseases like sore throat and common cold are not of bacterial etiology and hence they did not recommend antibiotics.

The main causes of the emergence of antibiotics resistance are the failure to implement policies and programs in preventing infections and also failure to follow the antibiotics usage guidelines strictly.³⁴ Hence teaching about antibiotics usage as well as the principles of the protocol development for antibiotics use in health care facilities should form an integral part of the undergraduate teaching curriculum.³⁵

The main limitation of this study was that it was based on a convenience sample which involved only one batch of

second year undergraduate medical students from one single teaching hospital.

CONCLUSION

This study provides useful information about the knowledge, attitudes and the practices of 2nd year undergraduate medical students about antibiotic resistance and usage. There is the need for appropriately teaching the medical students regarding antibiotic usage and resistance and more emphasis should be given in academics regarding the subject which can create a moral responsibility toward the judicious use of antibiotics among medical students.

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