

A Study on Awareness of Antibiotic Resistance among Medical Students: A Cross Sectional Study

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ABSTRACT

Background: Antibiotics are the drugs which can cure the infective diseases. They were the greatest contribution of the 20th century to therapeutics. Interestingly, antibiotics are the most commonly used and misused drugs of the 20th and current century. Poor knowledge and lack of training about antibiotic resistance during undergraduate medical students may lead to a change in behavior among future doctors. Research assessing undergraduate medical students' knowledge about antibiotic resistance is rare in the literature. Thus, the objective of this study was to assess the awareness of antibiotic resistance among undergraduate medical students.

Objectives: This Cross-Sectional, questionnaire based study is to assess the awareness of antibiotic resistance among medical students

Methodology: The present research is a cross-sectional, questionnaire based study conducted at Nimra institute of medical sciences, Ibrahim patnam, Krishna dist, Andhra Pradesh, India. After getting approval from the institutional research committee. The students who interested to participate in study were included. All the 334 students from year 1st, 2nd and year 3rd MBBS students participated in the study. A questionnaire consisting total of 15 questions distributed to the students and the data collected. The results were analysed using SPSS version 23. P value <0.05 considered as significant.

Results: 2nd & 3rd year students have more awareness of antimicrobial resistance than 1st year students.

Conclusion: The study concludes that medical students should have in-depth knowledge about

antibiotic resistance and its underlying mechanisms to prevent the misuse of antibiotics

Keywords: Antibiotic resistance, awareness, knowledge, medical students

INTRODUCTION

Antibiotic medications are widely used in the treatment and prevention of bacterial infections. ^(1,2) Various factors contributing to antibiotic resistance. ^(3,4) Antimicrobial resistance (AMR or AR) is the ability of a microbe to resist the effects of medication that once could successfully treat the microbe. ⁽⁵⁻⁷⁾ Resistant microbes are more difficult to treat, requiring alternative medications or higher doses of antimicrobials. These approaches may be more expensive, more toxic or both. Microbes resistant to multiple antimicrobials are called multidrug resistant (MDR). Those considered extensively drug resistant (XDR) or totally drug-resistant (TDR) are sometimes called "superbugs". ⁽⁸⁾ Rising drug resistance is caused mainly by use of antimicrobials in humans and other animals, and spread of resistant strains between the two. ⁽⁹⁾ as well as a lack of new drug development by the pharmaceutical industry due to reduced economic incentives and challenging regulatory requirements. ⁽¹⁰⁻²¹⁾ Antimicrobial resistance is increasing globally because of greater access to antibiotic drugs in developing countries. Estimates are that 700,000 to several million deaths result per year.

(22,23) Each year in the United States, at least 2.8 million people become infected with bacteria that are resistant to antibiotics and at least 35,000 people die as a result. (24) There are public calls for global collective action to address the threat that include proposals for international treaties on antimicrobial resistance. (25) Worldwide antibiotic resistance is not completely identified, but poorer countries with weaker healthcare systems are more affected. (26)

India carries one of the largest burdens of drug-resistant pathogens worldwide, including the highest burden of multidrug-resistant tuberculosis, (27) alarmingly high resistance among Gram-negative and Gram-positive bacteria (28) even to newer antimicrobials such as carbapenems and faropenem since its introduction in 2010. (29) Regional studies report high AMR among pathogens such as salmonella typhi, Shigella, Pseudomonas, and Acinetobacter. (30) Annually, more than 50,000 newborns are estimated to die from sepsis due to pathogens resistant to first-line antibiotics. (31) While exact population burden estimates are not available, neonates and elderly are thought to be worse affected. Two million deaths are projected to occur in India due to AMR by the year 2050. (32) It is no surprise that emergence of enzyme New Delhi metallo- β -lactamase (NDM-1), named after the national capital of India, in 2008 rapidly spread to other countries. (33) The important factor is the lack of knowledge and proper awareness among community and healthcare personnel. (34) Poor knowledge and lack of training about antibiotic resistance during undergraduate medical studies may lead to a change in behavior among future doctors. (35) Thus, the objective of this study was to assess the awareness of antibiotic resistance among undergraduate medical students.

METHODOLOGY

The present research is a comparative cross-sectional, questionnaire-based study conducted at Nimra institute of medical sciences, Ibrahim

Patnam, Krishna dist, Andhra Pradesh, India. Approval from the institutional research committee was taken for the study. Students were explained about the study. The students who interested to participate in study were included. All the 334 students from year 1st, 2nd and year 3rd MBBS students participated in the study. All the 334 students according to the year they are studying divided in to 3 groups. Group 1 - First MBBS students n= 106, Group 2 - second MBBS students n= 120, Group 3 - third MBBS students n= 108, A questionnaire consisting total of 15 questions distributed to the students .we asked the students to answer the questions by marking the options which are given under the question(yes/ no/ don't know) up to 14 question. For the 15th question we given the options of a)Whole society b) doctors c) patients d) quacks (included pharmacists, outside practicing nurses also included with them).

STATISTICAL ANALYSIS

Data were presented as frequencies, mean, standard deviation ,Data analyzed by using one way ANOVA & Multiple comparisons analyzed by using (post hock test).LST (least significant test) The results were analyzed by using SPSS version 23. P value < 0.05 considered as significant.

RESULTS

When we compared with 2nd and 3rd year students there is no significant improvement shown in third year students. This can be improved by continuous teaching about the importance of antibiotic resistance to the students. In our study 95% have the students had the knowledge about the causative organisms for both cold and influenza. For the question which asked that, Do you think taking the same antibiotic repeatedly will reduce the effectiveness of antibiotics to treat infections? 88 % of third year students given right answer and 12% of students given the wrong answer may be by misguided by over prescribing habits. question number 15 which asked about who are responsible for the development of

antibiotic resistance 44% students opinion is that is because of quacks which included not only RMP's but other than allopathic doctors, pharmacists, outside practicing nurses also included with them). 27% of students' opinion is patients are the

responsible for the development of antibiotic resistance. 26% of students opinion is all are responsible which includes patients, doctors, quacks. 3% of students' opinion is doctors are the responsible for the development of antibiotic resistance.

q.no.	question	Correct	% of by 1 st mbbs N=	right by 2 nd mbbs	answer by 3 rd mbbs
Q1	Do you think antibiotics can be prescribed for viral infections?	No	84% (89)	94% (112)	95% (103)
Q2	Do you think taking antibiotics will speed up the recovery of flu or common cold?	no	86% (91)	96% (115)	99% (106)
Q3	Do you think taking the same antibiotic repeatedly will reduce the effectiveness of antibiotics to treat infections?	yes	65%(69)	81%(97)	90%(97)
Q4	Can antibiotic be taken as OTC medication? (Without prescription from doctor)	no	62% (66)	86% (103)	88% (95)
Q5	Do you complete the course of antibiotics when prescribed?	yes	77% (82)	94% (113)	92% (100)

q.no	question	Right answer	% of by 1 st mbbs N= 106	right by 2 nd mbbs n=120	anser by 3 rd mbbs N=108
Q6.	Do you think skipping one or two doses of antibiotics will affect the outcome of treatment?	yes	58% (62)	76%(91)	77% (83)
Q7.	Have you heard about antibiotic resistance?	yes	92% (98)	100% (120)	100% (108)
Q8.	Do you think newer antibiotics are more effective in treating the infection?	yes	68%(72)	84% (101)	82%(89)
Q9.	Do you think Prevention of drug resistance is an expensive task?	yes	38%(40)	49%(59)	54%(58)
Q10.	Do you think Multi drug resistance is a challenge in case of Malaria, T.B &HIV?	yes	46%(49)	92% (110)	91% (98)

q.no	question	Right answer	% of by 1 st mbbs N=106	right by 2 nd mbbs n=120	anser by 3 rd mbbs N=108
Q11.	Do you think Antibiotic resistance can occur as a natural phenomenon also?	yes	54%(59)	91% (108)	94% (98)
Q12.	Do you think duration of illness doesn't get affected when a person suffers from resistant strains of organisms compared to sensitive ones?	no	40% (43)	71% (85)	59% (64)
Q13.	It is always better to stop antibiotics once the symptoms of illness get resolved; otherwise we expose ourselves to unnecessary side effects.	no	26%(28)	69%(83)	67% (72)
Q14.	Anti-microbial resistance doesn't affect much younger people, as it is a problem for elderly people only.	no	66% (70)	77% (93)	77% (83)

Multiple Comparisons (post hoc test)

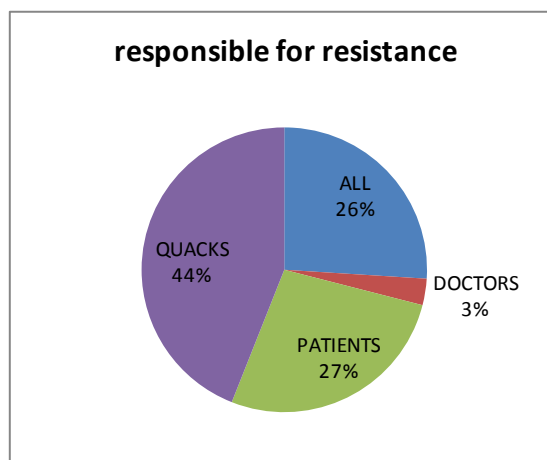
p value , 0.05 considered significant

group 1 - 1st MBBS

group 2 - 2nd MBBS

group 3 - 3rd MBBS

I group	J group	significance
1.00	2.00	0.009
	3.00	0.006
2.00	1.00	0.009
	3.00	0.893
3.00	1.00	0.006
	2.00	0.893



Q15. Whom you think are the reason for development of antibiotic resistance?

DISCUSSION

Antimicrobial resistance (AMR) has emerged as a major threat to public health estimated to cause 10 million deaths annually by 2050. India carries one of the largest burdens of drug-resistant pathogens worldwide. NDM-1 reported in 2008, rapidly spread to other countries was named after India's capital. India is one of the largest consumers of antibiotics worldwide and antibiotic sale is increasing rapidly. AMR develops when microbes develop mechanisms to evade the action of antimicrobials. The factors that contribute to AMR include irrational and overuse of antibiotics. In India, various actions have been taken including setting up of a National Task Force on AMR Containment (2010), "Chennai Declaration" by a consortium of the Indian Medical Societies (2012), Setting of Indian Council of Medical Research national surveillance network of laboratories, "Redline" campaign for educating public and National Action Plan on AMR 2017. There is a need integrating AMR education in medical education. India needs to start the subspecialty of infectious diseases and strengthen laboratory services. Every hospital needs to have an AMR policy including infection control, improvement in hygiene, and sanitation and antibiotic use. An element of research needs to be integrated into the AMR policy and encouragement of the pharmaceutical industry to develop "superbug antibiotics." Unless AMR is addressed effectively the gains made in health are likely to be lost. The present study aimed at assessing the awareness of antibiotic resistance among the medical students. Our findings showed that first year students had a lesser knowledge when compared to the 2nd and 3rd MBBS students. When we compared with 2nd and 3rd year students there is no significant improvement shown in third year students. This can be improved by continuous teaching about the importance of antibiotic resistance to the students. Our study comparable with the study conducted by

Scaiola G et al, found that 94.8% of the students were aware that it is mandatory to finish the full course of antibiotics. Study done in Kerala 77% of participants had knowledge that bacteria do not cause common cold and influenza and hence antibiotics should not be used for the treatment of the same. [7] In our study 95% have the students had the knowledge about the causative organisms for both cold and influenza. For the question which asked that, Do you think taking the same antibiotic repeatedly will reduce the effectiveness of antibiotics to treat infections? 88 % of third year students given right answer and 12% of students given the wrong answer may be by misguided by over prescribing habits. question number 15 which asked about who are responsible for the development of antibiotic resistance 44% students opinion is that is because of quacks which included not only RMP's but other than allopathic doctors, pharmacists, outside practicing nurses also included with them). 27% of students' opinion is patients are the responsible for the development of antibiotic resistance. 26% of students opinion is all are responsible which includes patients, doctors, quacks. 3% of students' opinion is doctors are the responsible for the development of antibiotic resistance.

CONCLUSION

By this study we conclude that awareness of antibiotic resistance among the students. Our findings showed that first year students had a lesser knowledge when compared to the 2nd and 3rd MBBS students. When we compared with 2nd and 3rd year students there is no significant improvement shown in third year students. This can be improved by continuous teaching about the importance of antibiotic resistance to the students in all years of medical graduation and there is a need of educating the patients about antibiotic resistance and every health care providers, government feel responsible in education and prevention of antibiotic resistance.

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