

Original Research Article

Knowledge, attitude and practices of antibiotic usage among students from Mumbai University

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ABSTRACT

Background: Discovery of antibiotics have helped to manage the devastating diseases. Presently, the antibiotic era is threatened by the emergence of high level of antibiotic resistance of important pathogens. Misuse of antibiotics poses a serious risk to infectious disease control. It is necessary to improve public awareness to bring a change in the behavior of consumers. Therefore, present study was undertaken to assess the existing knowledge, attitude and practices related to antibiotic usage among university students.

Methods: A cross-sectional study was carried out among students from Mumbai University, India during May-June 2017. 300 students were approached to participate in the study of which 250 agreed to participate (males: 117; females: 133). Pretested questionnaire was distributed and collected data was analyzed using IBM SPSS version 23.

Results: Substantial number (33% and 40%) participants were unaware about the differences in antibiotic-anti-inflammatory drugs and antibiotic-antipyretics respectively. 28% of the participants thought it is right to stop antibiotics only based on symptoms improvement. Sixty eight percent and seventy nine percent participants believed that antibiotics should always be prescribed to treat flu like symptoms and pneumonia respectively.

Conclusions: Participants demonstrated poor knowledge about antibiotics. Similarly, their attitude and practice toward antibiotic use was associated with misconceptions. An educational intervention can be introduced to make them aware about rational antibiotic practices.

Keywords: Antibiotic, Antibiotic resistance, Rational drug use, University students

INTRODUCTION

Discovery of antibiotics is one of the greatest events in the history of medicine which has profound effect on human life, and society as a whole. It helped to manage the devastating disease like plague or do surgeries

without a desperate gamble with human life. The death due to meningitis, tuberculosis, malaria, leprosy, septicemia once a common incident, is now under control. Presently, the antibiotic era is threatened by the emergence of high level of antibiotic resistance of important pathogens. Several well-known antibiotics commonly used in healthcare have become ineffective as

microbes have developed resistance to them.¹ Antimicrobial resistance has become a serious global challenge. Every continent and country is facing the menace of antibiotic resistant “super bugs,” though the extent and the severity of the problem varies.² A potential post-antibiotic era is threatening present and future medical advances.

The current worldwide increase in resistant bacteria and, simultaneously, the downward trend in the development of new antibiotics have serious implications. Resistant bacteria dramatically reduce the possibilities of treating infectious diseases effectively and multiply the risks of complications and a fatal outcome for patients.³ There could be a return to the pre-antibiotic era, where many people could suffer or die from untreatable bacterial infections.⁴ As misuse of antibiotics poses a serious risk to infectious disease control and public health in general, it is necessary to improve public awareness, enforce strict antibiotic policies and bring a change in the behavior of consumers. Major resistance control strategies therefore recommend education of the public to promote appropriate antibiotic use.⁵

The type and nature, as well as the extent of education to be given to the public, will depend on the kind of population to be addressed at any point in time.⁶ The objective of this study was therefore to determine the Knowledge, attitude and practice of antibiotic use among students from Mumbai University, so as to determine the kind of antibiotic education and awareness strategies applicable to them.

METHODS

Study design and respondents: This descriptive study was performed in May - June 2017, among students from Mumbai University, India. The study protocol was approved by V. V. research Independent Ethics Committee, Mumbai, India. Three hundred students were contacted by study team members in their classrooms and were given a brief introduction about the research project. Those who desired to participate were explained the purpose and objectives of the study. On the basis of the eligibility criterion (those who gave a written informed consent and are registered students of Mumbai university) 250 students were selected for the present study.

Study instrument: The survey questionnaire was prepared in English after reviewing the literature for similar studies. The questionnaire was framed to gather information on demographics and knowledge, attitude and practice towards antibiotic use.

A pilot study was done with a sample of 30 students, to know the average time required for face to face interview for completing the questionnaire and to ensure that it is appropriate and understandable to students. Pilot population was not part of the final study.

Collection of data: Students were interviewed face to face in the student office with prior appointment by a study team member. The purpose of the research was explained to the respondents, anonymity and confidentiality were guaranteed and maintained. The researchers complied with the international ethical guidelines for research. The data was recorded into the predesigned case report form (CRF) by interviewers.

Data entry and analysis: Collected data from individual CRF was entered into Microsoft excel and was verified by the authors other than interviewers. Data were analyzed by using descriptive statistical methods and a bivariate analysis was conducted with all relevant independent variables. P-value ≤ 0.05 was considered as significant. IBM SPSS version 23 was used for statistical analysis.

RESULTS

Table 1 shows antibiotic usage knowledge of respondents as well as bivariate analysis to determine differences between male and female responses. Out of 250 study participants, there were 117 males and 133 females in this study about antibiotics. Substantial number (33% and 40%) participants were unaware about the differences in antibiotic-anti-inflammatory drugs and antibiotic-antipyretics respectively. Only 72% of the participants thought it is not right to stop antibiotics only based on symptoms improvement. Forty seven percent and 74% participants thought flu like symptoms and pneumonia respectively should always be treated with antibiotics. Only 61% participants agreed to take antibiotics according to package instructions.

Similarly, only 68% participants felt it is not right to take less antibiotics than prescribed. Bivariate analysis revealed that, except for 1 out of 13 questions about antibiotic knowledge, there was no significant difference in male and female responses. For the question “should patients return for follow-up visit after taking antibiotics?” significantly ($\chi^2=4.215$; p-value=0.04) more females (120/133; 90%) answered yes as a correct response than male respondents (95/117; 81%).

Table 2 depicts the practice of antibiotic usage as well as bivariate analysis to determine differences between male and female responses. Out of 6 antibiotic usage questions, other than “how would you take antibiotics”, participants had low percentage of correct responses. There were significant differences among male and female respondents for question related to keeping antibiotic syrup in refrigerator and action taken after taking wrong antibiotics.

Table 3 depicts antibiotic usage attitude as well as bivariate analysis to determine differences between male and female responses. For most of the questions usage attitude of the majority of the study participants was incorrect. There was significant difference ($\chi^2 = 5.848$; p-

value=0.01) among male and female respondents for question related to attitude of participant in case of doctor

prescribing antibiotics without explaining the reasons.

Table 1: knowledge of antibiotic usage.

Variable	Correct answer	Male n (%)	Female n (%)	Total n (%)	χ^2 value	p-value	
Gender		117(46.8)	133(53.2)	250	-	-	
Education							
BS		103(88)	119(89)	222(88)	11.376	0.001	
MS		6(5)	14(11)	20(8)			
PhD		8(7)	0	8(3)			
Knowledge of antibiotic usage		Correct answer n (%)					
Have you heard of "ANTIBIOTICS" before?	yes	110(94)	131(98)	241(96)	3.59	0.057	
Do you think antibiotics are the same as anti-inflammatory agents?	no	77(66)	91(68)	168(67)	0.192	0.66	
Did you think antibiotics are the same as antipyretics?	no	71(61)	79(59)	150(60)	0.042	0.83	
Who should provide education about antibiotics?	all	109(93)	127(95)	236(94)	0.637	0.42	
Should patients follow the physician's directions when taking antibiotics?	yes	106(91)	127(95)	233(93)	2.35	0.12	
Is it okay to stop taking an antibiotic regimen if your symptoms are improving?	no	79(68)	100(75)	179(72)	1.79	0.18	
Should patients return for follow-up visit after taking antibiotics?	yes	95(81)	120(90)	215(86)	4.215	0.04	
Should flu-like symptoms always be treated with antibiotics?	no	62(53)	70(52)	132(53)	0.003	0.95	
Should pneumonia always be treated with antibiotics?	no	32(27)	34(26)	66(26)	0.102	0.749	
Would you take antibiotics according to the instructions on the package?	yes	72(62)	80(65)	152(61)	0.050	0.82	
Do some antibiotics cause adverse effects?	yes	93(79)	115(86)	208(83)	2.169	0.14	
Do you think that it's harmful to follow physicians' directions when taking antibiotics?	no	94(80)	116(87)	210(84)	2.19	0.139	
Do you think that taking less antibiotics than prescribed is healthier?	no	80(68)	89(67)	169(68)	0.06	0.8	

Table 2: Practice of antibiotic usage.

Variable	Correct answer	Male n (%)	Female n (%)	Total n (%)	χ^2 value	p-value	
		117	133	250			
Practice of antibiotic usage		Correct answer n (%)					
If you had pneumonia and your doctor did not prescribe antibiotics, what would you do?	Not to be concerned	54(46)	55(41)	109(44)	0.5833	0.4450	
How would you take antibiotics?	With water	106(91)	123(92)	229(92)	0.2868	0.5923	
Do you keep antibiotic syrup in the refrigerator?	yes	36(31)	22(16)	58(23)	7.072	0.007	
If you took the wrong antibiotics, what would you do?	Visit doctor immediately	95(81)	123(92)	218(87)	7.101	0.007	
If you are pregnant, should you take antibiotics?	No	98(81)	100(75)	198(79)	2.777	0.095	
If your family is sick, do you give your family members your antibiotics?	No	81(69)	106(80)	187(75)	3.619	0.057	

DISCUSSION

This study was aimed at assessing present knowledge, attitude, and practice of antibiotic use among university

students in Mumbai to evaluate the type of education and awareness campaigns suitable for them. Students demonstrated a poor knowledge about antibiotics and their use. Nevertheless, their attitude toward and practice of antibiotic use was associated with several

misconceptions. Therefore, a rigorous understanding of where their information is lacking would be helpful in designing educational campaigns that can help limit antimicrobial resistance due to ill practice and misinformation. In terms of knowledge of antibiotic use

obtained from Table 1, a considerable percentage of participants (96%) revealed that they had previously heard of antibiotics, and that patients should adhere to directions provided by their physician prior to using these agents (93%).

Table 3: Antibiotics usage attitude.

Variable	Correct answer	Male n (%) 117	Female n (%) 133	Total n (%) 250	χ^2 value	P-value
Attitude towards antibiotic use		Correct answer n (%)				
Would you follow the physician’s directions about antibiotic use?	yes	113(97)	132(99)	245(98)	2.259	0.132
Would you visit for follow-up after taking antibiotics?	yes	103 (88)	122 (92)	225(90)	0.994	0.33
If you had the flu-like symptoms, would you prefer a prescription containing antibiotics?	No	34(29)	46(35)	80(32)	0.87	0.34
If you had pneumonia, would you prefer a prescription containing antibiotics?	No	27(23)	26(20)	53(21)	0.464	0.49
If your doctor prescribed antibiotics but did not explain the reason, would you be satisfied?	No	94(80)	121(91)	215(86)	5.848	0.01

Additionally, majority of the participants indicated that antibiotics can be associated with adverse effects (83%). However, in 33 and 40 percent of the participants, knowledge about whether antibiotics and antipyretics are the same and whether antibiotics are the medication required for pneumonia treatment, respectively, was lacking. The erroneous conception that antibiotics are equivalent to pain killers or antipyretics has been reported in several earlier studies.⁷ Additionally, participants who ascertained that antibiotics are the go to treatment for pneumonia reflect a poor ability to distinguish between the sources of infection (bacterial or viral) in that disease. This is parallel to a study whereby 28.2% stated that antibiotics can cure viral infections.⁸

To highlight differences in knowledge between sexes, responses were stratified into males and females (Table 1). The knowledge difference between both groups was not significant ($p>0.05$) for 12 of 13 question. In contrast, when asked whether patients should follow up with their doctors after medication, a significantly higher percentage of females (90%) indicated that a follow up should be scheduled, compared to male respondents (81%), which indicates that females in this study show more commitment to physician recommended routines than males.

Though majority of participants demonstrated a fair knowledge about antibiotics, their practice of utilizing these drugs was casual. As evidenced from table 2, majority of responses (77%) indicated that antibiotic syrups should not be stored in a refrigerator, contrary to the correct practice, in which only 23% were able to get right.

In terms of administration of antibiotics, 92% indicated that they ought to be taken with water which reflects a proper behavior on behalf of these participants. Some participants (25%) thought it was ok to share their antibiotic treatment with relatives in case they got sick. This is consistent with a study conducted in a medical school in India whereby 26.4% of the participants shared the same view regarding the administration of antibiotics to friends or relatives.⁸ Antibiotic self-medication has been reported to be a facilitating factor for the spread of antibiotic resistance among a population.⁷ This behavior has raised concern in similar studies conducted in Serbia, Jordan, Nigeria and India.⁶⁻⁹

To highlight differences in knowledge between sexes, responses were stratified into males and females (table 2). The knowledge difference between both groups was not significant ($p>0.05$) for 4 of 6 question. In contrast, when asked whether patients should follow up with their doctors after medication, a larger portion of females stated that antibiotic syrup should be kept in the refrigerator ($p=0.007$), and an immediate visit to the doctor should occur if one were to take the wrong antibiotic ($p=0.027$). This data indicates that female students participating in this study have a better awareness of how to handle antibiotics, are more prone to consulting their physicians about their course of treatment and are less hasty when it comes to antibiotic self- medication.

When examining the attitude of participants toward antibiotics, a striking 68% preferred to be prescribed antibiotics to treat flu like symptoms. Additionally, 79% believed that antibiotics should always be given for the

treatment of pneumonia. No significant differences were obtained between male and female responses from table 3, except for the question: if your doctor prescribed antibiotics but did not explain the reason, would you be satisfied, to which 91% of females answered no compared to 80% of males ($p=0.01$). The prevalence of antibiotic resistance has allowed it to become a public health issue, particularly in developing countries.¹⁰ Not only does it pose a national health care burden, it also leads to more complications on the patient's behalf, such as more frequent visits to the doctor, longer illnesses, and the need to resort to more expensive or stronger drugs.¹⁰ Although this issue is partially rooted in practices by doctors or clinics such as over-prescription or prescribing these drugs for illnesses that are treatable with something else¹¹, the other part falls on the patients who have continuously practiced the misuse of these agents due to misinformation and lack of awareness.¹¹

CONCLUSION

Present study has provided an important glimpse into some of the weaknesses in awareness and education of Mumbai university students in terms of antibiotic knowledge, practice, and attitude. It is therefore essential for the necessary parties to partake in educational campaigns about how these drugs should be handled, disposed, taken, and most importantly to differentiate between viral and bacterial infections. Though males and females demonstrated equivalent knowledge about antibiotic agents, there appeared to be significant differences between the number of females who answered correctly in terms of their behavior and attitude toward handling and administering these drugs, as opposed to male participants. Though proper use of antibiotics is linked to the educational background of participants, it is essential to further investigate the origin of the disparity between males and females and the factors that lead to different attitudes and behavior about these drugs.

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