



A study on knowledge, attitude and practice of antibiotic usage and resistance among medical students in a tertiary care hospital

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ABSTRACT

Antibiotic resistance is a worldwide public health concern due to improper usage, increases morbidity, prolongs hospital stay duration and risk of mortality. Antibiotics are magic bullets against many microbial and bacterial infections. Doctors are using antibiotics in almost all treatments starting from the common cold to serious open-heart surgery. This study was done to assess the knowledge, attitude and practice on antibiotic usage and its resistance against microbial infections. About 169 medical undergraduates were briefed about the KAP questionnaire (detailed assessment of 4 parameters for knowledge, 5 parameters for attitude and 4 parameters for practice) and distributed to third year and final year medical students. Descriptive statistics was used to analyse the various parameters. About 83.72% of the participants were aware that excessive and inappropriate use of antibiotics causes ineffective therapy. About 53.84% were aware about the adverse effect profile of the antibiotic. 65.22% of the participants felt the emerging issue of antibiotic resistance due to inappropriate drug usage. They were conscious that antibiotics are advantageous for bacterial infection. The students had a good attitude, a majority had moderate knowledge and practice towards antibiotics use. The medical professionals are to be well trained about the rational prescribing pattern of antibiotics, adverse effects of drugs and antibiotic resistance.

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INTRODUCTION

Antibiotic resistance is a worldwide public health concern due to improper usage, increases morbidity, prolongs hospital stay duration and risk of mortality. Antimicrobial resistance is the major health

problems in developing countries like India, leading to a disproportionately higher level of antibiotic resistance. Antibiotics are often known as wonder drugs, but these drugs, due to inappropriate use, may lead to harmful effects (Fischbach and Walsh, 2009; Gyssens, 2001). Doctors are using antibiotics in almost all the treatments starting from the common cold to serious open-heart surgery. The problem in the use of antibiotics is due to its misuse by many physicians which creates a threat of becoming extinct for future generations (Dantas and Sommer, 2014). This misuse can also create economic hazards on the health care system. In 2011, WHO set the theme of World Health Day as Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow (Chan, 2011). Usage of antibiotics is influenced by several factors like self-medication, obtaining antibiotics without a doctor's prescription, no strict rules against irrational use of antibiotics,

Table 1: Knowledge Questionnaire

S.No	Knowledge Questionnaire	Label	Yes	%	No	%
1	Indiscriminate use of antibiotics can lead to	a) Ineffective therapy	141	83.72	28	16.27
		b) Increased side effects	91	53.84	78	46.15
		c) Prolongation of illness	94	55.62	75	44.38
		d) Leads to resistance to the bacteria	141	83.13	28	16.86
		e) Economic burden to the patient	102	60.05	67	39.94
2	If taken too frequently, antibiotics are less probable to work in the future.		141	83.13	28	16.86
3	Bacteria are germs that cause common flu and cold		80	47.04	89	52.95
4	Antibiotic conflict is: a significant and severe public health issue	a) In the world	39	22.78	130	77.22
		b) In our country	110	64.79	59	35.20
		c) In our hospital	123	21.89	46	78.11

drugs being unregulated etc (Tunger *et al.*, 2009).

For the betterment of resources availability in medical sciences, this irrational use of antibiotics has to be restricted (Parimalakrishnan *et al.*, 2012). Already, many replacement formulas are implemented in this regard, like giving guidelines to hospitals on the dose and usage of drugs, restricting the pharmacy to deliver drugs only on proper doctor prescription and stressing a more rational use of antibiotics worldwide (Huang *et al.*, 2013; Ganesh and Sridevi, 2012). The medical students and health professionals play a major role to overcome antibiotic resistance by promoting health education, encouraging patients to adhere to treatment and avoid self-medication (Jorak *et al.*, 2014; Jamshed *et al.*, 2014).

MATERIALS AND METHODS

This was a cross-sectional questionnaire study analysed among 169 medical undergraduates students in the 3rd year and final year MBBS at Saveetha Medical College following approval from the Institu-

tional Ethics committee. A questionnaire was used to analyze the knowledge, attitude and practice of antibiotic usage among 3rd year and final year students. The inclusion criteria included the medical students who were willing to participate in the study, and those not willing to participate or did not return the questionnaire within the stipulated time were excluded. A KAP questionnaire containing 13 questions (knowledge 04, attitude 05, and practice 04) was designed by modifying the earlier ones, which were used by (Vanden Eng *et al.*, 2003) and others.

After briefing about the study, the KAP questionnaire was distributed to 3rd year and final year medical students and were asked to complete the questionnaire. Informed consent was obtained from the participants to utilize their data for research purposes. Quality control was maintained as per the standard protocol and Confidentiality was maintained. Descriptive statistics was used to analyze the above parameters. SPSS version 17.0 was used to analyze the data.

Table 2: Attitude Questionnaire

S.No	Attitude Questionnaire	SA	A	UD	D	SD
1	During cold and cough, I take antibiotics to prevent from a further serious illness	8.27	38.05	10.21	32.15	11.32
2	During fever, antibiotics helps in fast recovery	17.19	39.06	25.57	11.11	7.07
3	While taking an antibiotic contribute to the development of antibiotic resistance	19.35	45.4	20.16	10.8	4.29
4	Not taking one or two doses may not lead to antibiotic resistance	5.26	25.14	30.38	26.16	13.06
5	Antibiotics are safe drugs; hence they can be commonly used	6.35	29.16	21.19	28.09	15.21

Rated Response: Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D), Strongly Disagree (SD)

The above tables shows that the Attitude Questionnaire. There are four questions involved to assess the Attitude.

RESULTS AND DISCUSSION

Out of 211 students, 169 (80.09%) were included in the analysis. Among the 169, 75 (44.37%) participants were males, and 94 (55.35%) participants were females. The Knowledge parameters were analysed using true/false type, and a Likert scale based question (“strongly agree” to “strongly disagree” and “always” to “never”) were used to assess Attitude and practices parameters.

About 83.72% of the participants were aware that excessive and inappropriate use of antibiotics causes ineffective therapy, higher side effects, prominent bacterial resistance, prolonged hospital stay and economic burden to the patient.

A majority of 83.13% (n=141) participants had the knowledge of the increased frequency of antibiotic intake leads to ineffective treatment in future. Only 47.04% (n=80) of the students knew that causative agents for colds and flu was not bacteria, and the remaining 52.95% (n=89) were unaware. The Knowledge attitudes and practices parameters

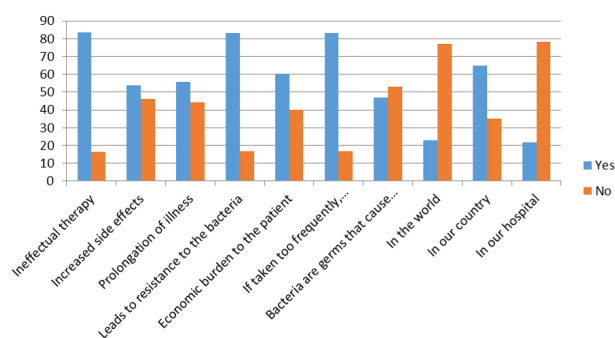


Figure 1: Knowledge Assessment

of the students are tabulated in the below tables (Tables 1, 2 and 3) and the same represented in (Figure 1) respectively. About 53.84% were aware about the adverse effect profile of the antibiotic. 65.22% of the participants felt the emerging issue of antibiotic resistance due to inappropriate drug usage. 70.29% of medical undergraduates had the knowledge of physician consultation prior to start an antibiotic course, and 81.88% felt the cost factor of antibiotics prescribed to be considered, which

Table 3: Practice Questionnaire

S.No	Practice Questionnaire	Label	1	2	3	4	5
1	The doctor prescribes a course of antibiotics for you. After taking 2-3 doses you start feeling better	a) Do you stop taking further treatment?	11.42	19.01	31.26	14.67	23.64
		c) Do you discard the remaining leftover medication?	12.47	12.85	25.18	16.67	32.83
		e) Do you complete the full course of treatment	41.58	26.24	18.35	6.5	7.33
2	Do you consult a physician prior to taking an antibiotic?		35.59	34.68	17.62	6.21	5.9
3	Do you check the expiry date of the antibiotic before starting it?		82.45	6.14	6.79	1.17	3.45
4	Do you prefer to take an antibiotic when you have a cough and sore throat?		9.89	22.78	28.79	19.59	18.95

Rated response: 1- Always, 2- Usually, 3- Sometimes, 4- Seldom, 5- Never.

otherwise leads to an economic burden on patients.

Table 1 represents the parameters collected using a standardized questionnaire from the medical students.

In this study, most of them are aware of the global and national level issue of antimicrobial resistance, but the awareness of a similar issue at the level of their hospital was comparatively less. This was similar to a previous study that also showed that the medical students were less aware of the emerg-

ing prevalence of antibiotic resistance in their institute (Thriemer *et al.*, 2013). The attitude of medical undergraduates with the usage of antibiotics were not serious. 46.03% of the students considered on developing a cold to avoid serious illness antibiotics should be taken and 56.25 % of them believed that they will feel better on taking antibiotics on having a cold/fever. Similar reports were seen in another study (Dhingra *et al.*, 2015).

The attitude of 35.51% of students was that antibiotics are safe drugs and commonly used, and 43.3%

considered as antibiotics were not safe, and 47.04% were not aware of the fact that bacteria were not responsible for causing cold and flu that was slightly more than other similar studies (15.5% and 22.7% respectively). This incorrect perception of students may cause inappropriate antibiotic prescription and usage leading to antimicrobial resistance.

Another studies analysed the practice of self-medication of antibiotics (35%) amongst medical undergraduates (Zafar et al., 2008). This study has shown more than 70% of students had a consultation with a doctor prior to taking antibiotics and had followed the prescription for the full course. Failure to follow and implement the antibiotic prescription policy at institution levels has to lead to the emergence and dissemination of resistant microorganisms. All institutions should conduct programs and adhere to strict guidelines/ policy for antimicrobial usage to overcome emerging resistance (Nathwani and Davey, 1999). All medical students should have integrated sessions between pharmacology and microbiology, helping them in the rational prescription of antibiotics and infection control. The prescribers should have knowledge about the microorganism sensitivity pattern that will reduce the burden of antibiotic resistance. Hand washing techniques to control of resistance should be encouraged, and its practice should be started at an earlier stage of the medical profession. In our study, the students were aware and concerned about the individual patient's benefits and harms, the dangerous consequences of indiscriminate antibiotic use.

CONCLUSIONS

The current study on antibiotic utilization gives beneficial facts about the understanding, attitudes, and practices of 3rd and final year medical students, which may be utilized to design an appropriate educational interventions/small group exercises that will improve the prescription pattern of antimicrobial drugs and reducing the development of drug resistance.

Conflict Of Interest

The authors declare that they have no conflict of interest for this study.

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