Original Research Article

Awareness on antibiotic usage among undergraduate medical students in a teaching hospital, Guntur

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ABSTRACT

Background: Antibiotics are the mainstay treatment of most of the infectious diseases. Inappropriate and irrational use of antimicrobial agents has led to increase in the development of antimicrobial resistance. Medical students are a part of health care system and they must be aware of increasing antibiotic resistance as they are the future prescribers. The objectives of the study were to assess the awareness on antibiotic usage and its resistance among medical students and to study the perception on antibiotic medication among medical students.

Methods: This was a cross-sectional, semi-structured questionnaire-based study. Questionnaire consists of 4 parts-socio-demographic details, awareness on antibiotics and its resistance, knowledge on specific treatment of a disease, perception levels. Prior IEC approval was taken. The obtained data was statistically analyzed using Microsoft excel sheet.

Results: Among 230 participants, majority of the students have awareness on general antibiotic usage and 97.8% were having knowledge about antibiotic resistance. The main source of information on antibiotic resistance is identified as classroom teaching (67.8%). 46.9% and 25.2% students correctly identified the drug of choice for treating enteric fever and community acquired pneumonia respectively.

Conclusions: Degrees of awareness on antibiotics and its resistance is found to be good. Antibiotic usage pattern is not on par with knowledge. Knowledge on specific treatment of infectious disease is found to be less. So, antibiotic teaching should be integrated with clinical subjects.

Keywords: Antibiotic usage, Antibiotic resistance, Clinical based learning

INTRODUCTION

Antibiotics are the mainstay treatment of most of the infectious diseases. These are the most frequently prescribed drugs, but they are often misused.[1,2] In 2010, India was the world's largest consumer of antibiotics for human health.[3]

Antibacterial resistance is the ability of bacteria to resist the effects of antibiotics acting against it.[4] Resistance is a global public health threat, rapidly increasing in South-East Asian countries.[5] In India, inappropriate and irrational use of antimicrobial agents has led to increase in development of antimicrobial resistance.[6] New resistance mechanisms are emerging and spreading globally, threatening our ability to treat common infectious diseases, resulting in prolonged illness, disability, and death.[7] A project commissioned by the British government estimates the near-future global toll of antibiotic resistance as 10 million deaths per year.[8]

Medical students are a part of health care system and they must be aware of antibiotic usage and resistance as they are the future prescribers. So, this present study was

conducted to assess the awareness on usage of antibiotics and antibiotic resistance among medical students.

Objectives

The objectives of the study were to assess the awareness on antibiotic usage and its resistance among medical students and to study the perception on antibiotic medication among medical students.

METHODS

This study was a cross-sectional and semi structured questionnaire-based study. Voluntary participants of 3rd and 4th year students of Katuri Medical College and Hospital (KMCH) were taken into the study. Institutional Ethics Committee (IEC) clearance was obtained prior to the beginning of study. Strict anonymity was assured. Details of the study and intention behind the survey were explained clearly before administering the questionnaire. Informed consent was taken and questionnaires were administered.

Questionnaire consists of 4 sections.

Section-1: Socio-demographic characters of the students like age, gender and year of study

Section-2: It includes questions on general awareness on antibiotics and antibiotic resistance.

Section-3: It attributes to the assessment of knowledge on specific treatment of common diseases.

Section-4: It focused on perception levels of the students.

The data obtained was entered in Microsoft Excel Sheet and descriptive analysis of the socio demographic data was done accounting the age, gender, and year of study. For dichotomous variables like gender and year of study, results were expressed in terms of frequencies and percentages and for continuous variables like age, results were expressed as mean and standard deviation.

Results of awareness on antibiotics and antibiotic resistance and specific treatment of common disease were expressed in frequencies and percentages. Outcomes of perception levels were assorted as agree/yes and disagree/no and the percentages were calculated.

The final result obtained was categorized as good (75% and above), moderate (50-74%) and poor (50%).

RESULTS

A total of 230 students participated in the study out of which 58.7% were 4th year and 41.3% were 3rd year. Out of them 72% (n=165) females and 28% (n=65) were males. Mean age of the participants was 20 years with S.D (standard deviation) of 0.98. 80% of the participants used antibiotics in the last year, and 48.7% of the total students used them for 1-2 times in last year (Table 1).

Table 1: Socio-demographic characteristics.

Details	N (%)
Gender	
Female	165 (72)
Male	65 (28)
Age (mean±SD)	20.66±0.98
Year of study	
3rd year	95 (41.3)
4th year	135 (58.7)
Antibiotic use in last year	
Yes	184 (80)
No	46 (20)
No. of times antibiotics were taken in last year	
1-2	112 (48.7)
3-5	46 (20)
>5	26 (11.3)

Table 2: Awareness on antibiotics and its resistance.

Questions	Correct response (%)
Antibiotics can kill good bacteria present in our body	220 (95.6)
Antibiotics can cause secondary infections by killing good bacteria	189 (82.2)
Antibiotics are indicated to reduce any kind of pain and inflammation	182 (79.1)
Antibiotics can cause untoward effects (e.g., allergic reactions)	212 (92.2)
Antibiotic resistance is a phenomenon for which a bacterium loses its sensitivity to an antibiotic	225 (97.8)
Source of information on antibiotic resistance	
Classroom teaching	156 (67.8)
Books	60 (26.1)
Others	9 (4)

Table 3: Awareness on specific treatment.

Infectious disease	Correct response (%)
Enteric fever	108 (46.9)
Community acquired pneumonia	58 (25.2)

Majority of the students were aware of general antibiotic usage. 97.8% students were having knowledge about antibiotic resistance. 67.8%, 26.1% of the total students knew about antibiotic resistance through classroom teaching, books respectively and 4% of the total students knew about it through other sources. 95.6%, 82.2% of the students were aware that antibiotics can kill good bacteria of our body and thus cause secondary infections respectively. 79.1% know the indications of antibiotics, but more than 92% knew that antibiotics can cause untoward effects (Table 2).

Table 4: Perception of medical students on antibiotic usage.

Questions	Response (%)	
	Agree (yes)	Disagree (no)
Misuse of antibiotic can lead to loss of sensitivity of an antibiotic to a specific pathogen	224 (97.4)	6 (2.6)
If symptoms improve before the completion of full course, you can stop taking it.	18 (7.8)	212 (92.2)
Antibiotic resistance is associated with increased morbidity, mortality and prolonged hospitalization of the patient	212 (92.2)	18 (7.8)
Imparting education on "Rational use of antibiotics" is significant for UG medical students	224 (97.4)	6 (2.6)
Antibiotic teaching in pharmacology should be integrated with clinical subjects	227 (98.7)	3 (1.3)
Education on antibiotic resistance to the nurses and pharmacists is required	225 (97.8)	5 (2.2)
Do you usually take antibiotic for cold or sore throat?	74 (32.2)	156 (67.8)
Do you usually take antibiotic for fever	82 (35.6)	148 (64.4)
Do you take antibiotics only when prescribed by the doctor?	178 (77.4)	52 (22.6)
Do you keep leftovers antibiotics at home because they might be useful in the future?	118 (51.3)	112 (48.7)
Do you use leftovers antibiotics without consulting your doctor?	35 (15.2)	83 (36)

46.9% students correctly identified the drug of choice for treating enteric fever whereas 25.2% students identified the drug of choice for treating community acquired pneumonia (Table 3).

98.7% of the students agreed that antibiotic pharmacology teaching should be integrated with clinical subjects. 97.4% students knew the effect of antibiotic misusage on a pathogen. 92.2% students were aware that antibiotics should not be stopped prior to the completion of its full course, even if the symptoms subside. 92.2% students opined that antibiotic resistance is associated with increased morbidity, mortality and prolonged hospitalization. 97.4% students agreed that education on the rational usage of antibiotics is significant for UG medical students and 97.8% students agreed that education on antibiotic resistance is to be extended to nurses and pharmacists as well. 67.8%, 64.4% students did not take antibiotics for cold or sore throat and fever respectively. 77.4% students agreed that they will take antibiotics only when prescribed by the doctor. 51.3% of the students kept leftover antibiotics at home for future use, and 15% of the total students used them without consulting doctor (Table 4).

DISCUSSION

In our study, 184 (80%) students used antibiotics in the last year and 112 (48.7%) students used 1-2 times, 46 (20%) students used 3-4 times and 26 (11.3%) students used >5 times, which was found to be higher when compared to Scaioli et al, study conducted in Italy in which 45.6% used antibiotics in the preceding year and 81.8%, 15.5% and 2.7% used 1-2, 3-5, >5 times respectively.[9]

Untoward effects of antibiotics are well known to 92.2% of the total participants which is similar to Scaioli et al study conducted in Italy in which it was 93.4%.[9] 92.2% of the students in our study know that antibiotic resistance can cause prolonged hospitalization and increases the mortality and morbidity. This was found to be higher than Sharma et al study (82.5%) conducted in Rajasthan, India.[10]

97.4% of all the students participated have better understanding that inappropriate use of antibiotics can harm patients and cause antibiotic resistance, which is similar to Abbo et al study performed in US which showed almost all the students interviewed were aware of antibiotic resistance.[11] 97.8% of the respondents agreed that, education on antibiotic resistance to the nurses and pharmacists is required which is more when compared to the study done by Sharma et al, in which only 50% agreed.[10]

67.8% believed that antibiotics are not used against cold and sore throat which is more compared to 40% in 2013 Eurobarometer report on antibiotic resistance.[12] 92.2% students believed that antibiotic should not be stopped till entire course is finished even if the symptoms subside.

98.7% of students admitted that Antibiotic stewardship teaching in pharmacology should be integrated with clinical subjects. Similar results were found with Vasundara et al, study and Sharma et al, study in which 98% of the students believed the integration of Antimicrobial pharmacology with clinical subjects. 80% used antibiotics in the last year and 77.4% said that they buy antibiotics without a medical prescription, which implies that knowledge on antibiotics is not on par with their consumption which is detrimental to health care.[10,13]

95.6%, 82.2% of the participants agreed that antibiotics can kill good bacteria present in our body and thus causes secondary infections respectively. This is more when compared to Scaioli et al, study in which only 21.4% students admitted that antibiotics can kill good bacteria.[9]

51.3% had kept left over antibiotics at home and 15.2% used them which is less than a global survey performed by Kardas et al, where 50% of the sample interviewed admitted having left over antibiotics.[14]

CONCLUSION

Proportion of antibiotic usage by UG medical students was found to be more but frequency of usage is less when compared to the similar studies conducted in countries like Italy and US. Antibiotic usage pattern is not on par with knowledge which must be overcome by initiating awareness programs on the rational use of antibiotics. Knowledge on specific treatment of infectious diseases is found to be less. So, Antibiotic teaching should be integrated with clinical subjects. Degree of awareness on antibiotics & its resistance is found to be good.

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