ORIGINAL ARTICLE

Prevalence and Pattern of Antibiotic Self-Medication among Selected Medical Fraternity from Haryana

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Abstract:

Background: Sub-optimal prescribing practices have contributed to the emergence and spread of antimicrobial resistance. *Objectives:* This study aims to estimate the prevalence and to assess the pattern of antibiotic self-medication among selected medical fraternity. An additional objective was to compare the usage of antimicrobials in students with no formal pharmacology education and those who have completed pharmacology education. *Material and Methods*: This cross-sectional study included 305 undergraduate students of MBBS, medical interns and the residents. Data were collected using a modified version of a validated questionnaire. Chi square test compared the significance of antibiotic self-medication between the two study groups, pre-clinical (subjects with no formal pharmacology education) and Clinical Group (subjects with formal pharmacology education). *Results*: The prevalence of self-medication among the study population was 89.84% (n=274).The prevalence of self-medication among the Preclinical and Clinical group is as follows 89% and 90% respectively. Fever was the most common indication cited for self-medication (77.37%), followed by cough/cold (74.09%) and headache (73.12%).Amoxicillin/Clavulanic acid was the most common antibiotic consumed. 59 (52.2%) of study subjects in pre-clinical group whereas 153 (79.7%) in clinical group checked for adverse effects of a particular antibiotic before using it. *Conclusion*: This study concludes that the practice of self-medication amongst medical undergraduates, interns and residents is very common – about 90% while that of real cause of concern is the use of anti-biotic (63.93%) This study also points out the indiscriminate use and irresponsible attitude towards antibiotics by the Preclinical group upon which change is urgently required.

Keywords: Self-medication, cross sectional studies, reasons, pattern, antibiotic, pharmacology, medical fraternity.

Introduction:

Antibiotics are one of the most common drugs being prescribed in every day clinical practice by physicians, and are often consumed in the form of self-medication by physicians themselves. Dispensing of antimicrobial drugs without prescription by pharmacies in the private sector in India within an urban setting was unacceptably high (around 67%).[1] The prevalence rate of self - medication among medical students in India is quite high - nearly 87%.[2] Sub-optimal prescribing practices have contributed to the emergence and spread of antimicrobial resistance.[3] It has been emphasized that antimicrobials should be prescribed only when they are necessary in treatment following a clear diagnosis.[4] According to the World Health Organization, education of healthcare workers and medical students on rational antimicrobial prescribing or antimicrobial stewardship is an integral part of all antimicrobial resistance containment activities.[5,6] Efforts should be implemented to address these gaps and to ensure that our future doctors appreciate the importance of antimicrobial stewardship. Medical schools should be partners in the effort to reduce antimicrobial resistance and "steward" our valuable antimicrobials.[7] In India, antibiotic resistance presents a significant public health threat, exacerbating the challenge of treating common infections. Overuse and misuse of antibiotics, coupled with inadequate infection control measures, fuel the emergence of resistant bacteria. This trend not only diminishes the effectiveness of existing antibiotics but also increases healthcare costs and mortality rates. Without swift intervention and robust antimicrobial stewardship efforts, India faces heightened risks of treatment failure, prolonged illnesses, and increased mortality rates, underscoring the urgent need for multifaceted strategies to combat antibiotic resistance. The medical students, especially undergraduates of today need to be trained and educated

properly as they are going to become the major prescribers of antibiotics in the coming years.[8]Therefore this study was conceptualized with the following objectives to estimate the prevalence and to assess the pattern of antibiotic self-medication in undergraduate medical students and residents. An additional objective was to compare the usage of antimicrobials in students with no formal pharmacology education and those who have completed pharmacology education.

Material and Methods:

This study cross-sectional study was conducted ata tertiary care teaching hospital of Haryana state on the undergraduate students of MBBS, medical interns and the residents over a period of six months in year 2019. The study population comprised of students from all batches of MBBS i.e. 1st Professional, 2nd Professional, 3rd Professional and 4th Professional, medical interns as well as the resident doctors currently practicing in the hospital. A total of 305 volunteers from the hospital were included in the study.It is pertinent to mention that as universe of study population was taken up for this study. Study subjects were divided into two groups, Pre-clinical (subjects with no formal pharmacology education) and clinical Group (subjects with formal pharmacology education). Study subjects who did not wish to share their health status and who did not provide their consent to participate in the study were excluded.A pre-designed, semi-structured questionnaire was used to collect the relevant information. Questionnaires were presented in the English language. The students were addressed regarding the purpose and process of data collection, prior to the administration of the questionnaire. They were informed that their participation is completely voluntary. Questionnaires were only distributed among the participants after taking informed consent. In order to maintain confidentiality, lecturers, professors and members of the faculty were not involved in outlining, obtaining consent or collection of the questionnaires. A pretested semi structured questionnaire having two sections was used in the study. First section included information regarding socio-demographic profile of the participant viz name, age, sex and year of education. Second section included questions regarding practice of self-medication, knowledge and use of antibiotics, knowledge of antibiotic resistance and attitude and awareness towards various aspects of self-medication and antibiotic resistance. The questionnaire is a validated modification of the questionnaire used in World Health Organization (WHO) study 'Antibiotic Resistance: Multi Country Public Awareness Survey.[9]Few components have also been incorporated from the questionnaire designed by Eng JV et al and others.[10,11] Ethical approval was obtained before conducting this study. Written informed consent was taken from the study subjects. Data was entered in excel sheet and was imported to SPSS software (Statistical Package for Social Sciences) for statistical analysis. Simple descriptive statistics were used to generate frequencies, percentages and proportions. Chi square test was used to compare the significance of antibiotic self-medication between the two study groups, Pre-clinical (subjects with no formal pharmacology education) and Clinical Group (subjects with formal pharmacology education).

Results:

Of total 305 study participants,55% of all the participants in the study were females. Pre-clinical category comprises of 37% of the students with a mean age of 19.86 (SD $\pm$ 0.91) while the clinical category comprises of 63 % (192/305) of the students with a mean age of 22.75 (SD $\pm$ 2.63). (Table 1)

Table 1: Distribution of participants as per year of study and gender of study subjects

Group	Year of study	Females	Males	Total (%)
Pre-clinical group	MBBS 1st Year	26	28	54 (17.7%)
	MBBS 2nd Year	32	27	59 (19.3%)
Clinical group	MBBS 3rd Year	35	20	55 (18%)
	MBBS 4th Year	31	24	55 (18%)
	MBBS Interns	31	19	50 (16.4%)
	Residents	13	19	32 (10.5%)
Total		168 (55%)	137(45%)	305 (100%)

The prevalence of self-medication among the study population is 89.84% (n=274). The prevalence of self-medication among the Preclinical and Clinical group is as follows 89% and 90% respectively. Fever was the most common indication cited for self-medication (77.37%), followed by cough/cold (74.09%) and headache (73.12%). About 40% of the respondents had consumed an antibiotic in the last 6 months. Amoxicillin/Clavulanic acid was the most common antibiotic consumed. One hundred-one (89.4%) study subjects in pre-clinical group and 183 (95.3%) in clinical group were of the view that many

infections are becoming increasingly resistant to treatment by antibiotics. (Table 2)

Table 2: Comparison of the level of HbA1c in selected groups.

Statements for assessing knowledge about antibiotic usage	Pre-clinical (n=113)		Clinical (n=192)		p value
	True (%)	False (%)	True (%)	False (%)	
Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well	94 (83.2%)	19 (16.8%)	141 (73.4%)	51 (26.6%)	>0.05
Many infections are becoming increasingly resistant to treatment by antibiotics	101 (89.4%)	12 (10.6%)	183 (95.3%)	9 (4.7%)	<0.05
If bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause	83 (73.5%)	30 (26.5%)	152 (79.2%)	40 (20.8%)	>0.05
Antibiotic resistance is an issue in other countries but not here	13 (11.5%)	100 (88.5%)	13 (6.8%)	179 (93.2%)	>0.05
Antibiotic resistance is only a problem for people who take antibiotics regularly	60 (53.2%)	53 (46.9%)	60 (31.3%)	132 (68.8%)	<0.001

Table 3: Attitude towards antibiotic usage among study subjects

Statements for assessing attitude about antibiotic usage	Pre-clinical (n=113)		Clinical (n=192)		p value
	Agree (%)	Disagree (%)	Agree (%)	Disagree (%)	
Antibiotics are safe drugs therefore they can be used commonly	65 (57.5%)	48 (42.5%)	86 (44.8%)	106 (55.2%)	<0.05
Missing one or two doses does not contribute to development of antibiotic resistance	44 (38.9%)	69 (61.1%)	59 (30.7%)	133 (69.3%)	>0.05
Unnecessary antibiotics makes them ineffective	94 (83.2%)	19 (16.8%)	168 (87.5%)	24 (12.5%)	>0.05
Whenever I take an antibiotic, I contribute to development of its resistance	63 (55.8%)	50 (44.2%)	72 (37.5%)	120 (62.5%)	<0.05

Fifty-nine (52.2%) study subjects in pre-clinical group and 153 (79.7%) in clinical group checked for adverse effects of a particular antibiotic before using the drug. (Table 4)

Table 4: Practice while using antibiotics does the participant check the following

Statements for assessing practice about antibiotic usage	Pre-clinical (n=113)		Clinical (n=192)		p value
	Yes (%)	No (%)	Yes (%)	No (%)	
Dose and frequency of drug	106 (93.8%)	7 (6.2%)	181 (94.3%)	11 (5.7%)	>0.05

Adverse effects	59 (52.2%)	54 (47.8%)	153 (79.7%)	39 (20.3%)	<0.001
Expiry date	111 (98.2%)	2 (1.8%)	189 (98.4%)	3 (1.6%)	>0.05

Discussion:

The present study was conducted to assess the practice of self-medication, especially with anti-biotics among undergraduate medical students and residents. It also involved comparison of knowledge, attitude and practices of the students who have not attained formal pharmacology education (Preclinical group) with those who have attained pharmacology education (Clinical Group). In the present study, the prevalence of self-medication among medical undergraduates and residents was found out to be 89.84%. In similar studies conducted in other parts of India, the prevalence was found out to be 67% in Jammu and 54% in Gulbarga.[12,13]In other parts of the world, self-medication among medical undergraduates was reported to be 55.3% in Karachi and 25.4% in Ethiopia.[14,15] Most common indication for self-medication in the present study was fever (77.37%) which was similar to observations made in Ethiopia and Mangalore.[15,16] However, cold and cough was found out to be the most common indication in a medical college at Gulbarga.[17] In the present study, the most commonly consumed class of drugs in the form of self-medication was antipyretic and analgesics (83.28%), followed by Antibiotics (63.93%). Antipyretics were also the most commonly self-medicated drug among medical students in a study conducted in Mangalore and Ethiopia.[16,15] However, antibiotics were reported to be the most commonly self-medicated drug in Gulbarga.[17] Another similar study conducted in Bahrain reported that the most commonly cited class of drugs for self-medication was analgesics, with usage of antimicrobials only restricted to 6% among medical students. This is in stark contrast to the results of our study where prevalence of self-medication with antibiotics stands at 63.93%. According to the researchers, this might be due to stringent regulations imposed by the Government of Bahrain on prescription and over the counter sale of antibiotics.[16] This contrast between the two studies suggests lack of regulatory policies and the non-execution of existing policies on OTC drugs in our country. The most common antimicrobial drug to be used as self-medication was found out to be Amoxicillin/ Clavulanic acid (56.07%) which is similar to a study conducted among medical undergraduates in Sri Lanka and a medical college in North India.[17,18] Sore throat (54.1%) was the most common indication for self-medication with anti-biotics in the present study in contrast to a medical college in South India where upper respiratory tract infections were the most common indication for antimicrobial self-medication.[19] The common reasons for self-medication in a study done by MensurShafie et al. were perceptions of the mildness of illness, previous knowledge about the medication, and emergency situations warranting self-medication.[20]Familiarity with the treatment or medication was the most commonly cited reason in the study done by Sridhar S et al.[21] The chief reason for self-medication reported in the present study was that it is "time-saving," which is similar to the result of Keshari S et al.[22] Visits to healthcare personnel are often time-consuming and add to the financial burden of a family, making self-medication a more viable option. There are certain limitations of this study as well. The cross-sectional nature of the present study precludes inferences about causality. The present study used a certain recall period, which might have led to a recall bias. Efforts were made to minimize this bias by using a well-designed, simple, and easy-to-understand questionnaire.

Conclusion:

This study concluded that the practice of self-medication amongst medical undergraduates, interns and residents is very common (90%) and thereal cause of concern is the overuse of anti-biotic (63.93%) This study also points out the indiscriminate use and irresponsible attitude towards antibiotics by the preclinical group.Changes are required in the framework and execution of the proper OTC drugs policy and preventing the open sale of antibiotic without prescription.

Sources of supports: Nil
Conflicts of Interest: Nil

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