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Research Paper

Antibiotic use Among Medical and Para Medical Students: Knowledge, Attitude and its Practice in a Tertiary Health Care Centre in Chennai- a Scientific Insight

Medical Science

KEYWORDS : antibiotic use and resistance, KAP, questionnaire based study, medical education.

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ABSTRACT

Aim: The objective of this study was to examine the level of knowledge, attitude and practice about antibiotic use among the medical and para medical students. Research have begun to focus on social aspects of antibiotic management especially the knowledge, attitude and practice (KAP) among general population on antibiotic use. But very few studies have been published on the relationship between KAP and medical education. In this study, we survey the medical students and para medical students' KAP on the use of antibiotics and scrutinize the effect of curriculum and their knowledge on antibiotic use and its resistance. Methodology: In this study, 300 students were included to participate in the questionnaire survey on students' knowledge, attitude and practice toward antibiotic usage. Analysis was done based on Chi square test .Results: 272 (90.66%) respondents were considered valid for statistical analysis. The students included were interns(100), final year medical students(100) and physiotherapy students(100).The level of knowledge of Medical students on the use of antibiotics was significantly higher than that of Non medical students ($p < 0.0001$). Analysis was done among all the three groups and statistically analysed. Conclusion: This study states that medical curriculum significantly improves students' knowledge on antibiotics and brings their attention on antibiotic resistance due to inappropriate use of antibiotics.

INTRODUCTION

Antimicrobial resistance (AMR) is a worldwide problem preferentially affecting low- and middle income countries [1,2]. Two main contributing factors are (i)excessive use of antimicrobials (AMs) adding to an increased selection pressure and (ii) insufficient infection control policies favouring the spread of resistant microorganisms [3]. Patients who receive AMs have an increased risk of acquiring infection from resistant microorganisms [4] and such infections may be associated with increased mortality and morbidity [5,6]. Between 20% and 50% of antibiotic use is either unnecessary or inappropriate [7,8], and decreasing it is a necessary first step to curb antibiotic resistance. Guidelines or similar well-intentioned interventions are often not enough to change behaviour in clinical practice [9].

Knowledge and beliefs are social cognitive factors at an individual level that influences health-related behavior, including the behavior of using antibiotics. Knowledge by itself is not enough to change behavior, but does play an important role in shaping beliefs and attitude regarding a particular behavior [10].These surveys reflect the general public's lack of understanding on proper use of antibiotics. Thereby, it reinforces the necessity that establish certain guidelines for public education on the use of antibiotics. Such guidelines would help rationalize public practice in relation to antibiotics use [11, 12].

We included the medical interns, final year MBBS students and physiotherapy students to assess their knowledge, attitudes and practice concerning antibiotic resistance and prescribing. Our goal was to bring out the effect of present medical curriculum and their influence on the medical and para medical students.

STUDY METHODOLOGY

The study was conducted in a tertiary health care centre in Chennai. The study population included under the study were 100 medical internship students, 100 final year MBBS students and 100 physiotherapy students. The total number of respondents were 272(90.66%) which include 94 interns, 86 final year MBBS and 92 BPT students.It was a questionnaire based study categorised on knowledge, attitude and practice. It was designed mainly to assess the students' understanding of antibiotics, and also to compare the medical and para medical students' KAP towards antibiotic use which would bring the differences among the three groups. The questionnaire was modified from the KAP study conducted in china among the medical students(13).

The final version of the questionnaire had 30 questions subdivided into four categories: knowledge of antibiotics, attitude towards antibiotic use, perception of public education and practice towards antibiotic use.

(i) The part on knowledge of antibiotic use had 11 questions covering the normal flora of microbes, concepts of drug sensitivity and susceptibility; relationship of disease, drug resistance, and side effects of antibiotics; views on effectiveness of antibiotics among others.
(ii) The part on attitude had 5 questions on the seriousness of antibiotic abuse; its influence on the student and his/her family, and the causes of the abuse.
(iii) The part on the perception of perception on public education had 5 questions relating to sources of antibiotics knowledge, information channel, and eagerness to the related knowledge; college course arrangement and proper use of antibiotics campaign. (iv) The part on behaviour had 9 questions ranging from the frequency of antibiotic use in fever, illnesses and various other symptoms; understanding of prescription drugs and doctor's prescriptions; drug withdrawal status among others. When compare the overall results of each partitions all questions are concerned(13).

The response for knowledge based questions were 'yes' or 'no'. The attitude component was assessed in terms of 'agree' or 'disagree'. The practice aspect of antibiotic use were assessed in terms of grading as always or often. A higher score shows the lower dependency on antibiotics which relates to better antibiotics usage behaviour.

The statistical analyses of categorical variables (responses to questions on knowledge, attitude, practice) were done using Chi square test to assess the association between medical education and KAP towards antibiotic use. A $p < 0.05$ was considered statistically significant.

RESULTS:

Response and data availability

Of the 300 questionnaires distributed, 272 (90.66%) were considered valid (with 80% of questions in questionnaire answered) and suitable for analysis. Of these, 94 interns, 86 final year MBBS and 92 BPT students were the respondents.

KNOWLEDGE ON ANTIBIOTICS

The results shows that overall Medical student scored remarkably better than Non medical students on knowledge of antibiotic use (CRRI s vs BPT, $p < 0.000002$ and final year MBBS

vs BPT were p< 0.00047)) while no significant difference was found between CRRI s and final year MBBS (p = 0.10). The same pattern of results was recorded when answers of each of the questions among Medical and para medical students were analyzed using $\chi 2$ test . For example, on the question of 'Have you heard of antibiotics resistance?', the medical students' response were statistically significant ($p < 0.0001$)when compared to physiotherapy(BPT) students. And for the valid question like, 'can antibiotics cure viral infections', all the medico significantly gave correct response as compared to para medical students of only 3 correct responders. For crucial questions like 'Is the efficacy better if the antibiotics are newer and more costly?' all the three groups showed lesser percentage of correct response, as shown in table 1.

Table 1: Knowledge of antibiotics among C.R.R.I's, final years and paramedical students

Questions on knowledge of antibiotics (correct response)	Percentage of C.R.R.I with correct response	Percentage of final years with correct response	Percentage of paramedicals with correct response	C.R.R.I Vs Final year Chi square value (P – VALUE)	C.R.R.I Vs paramedical Chi square value (P – VALUE)	Final year Vs paramedical Chi square value (P – VALUE)
Can antibiotics cure bacterial infections? (yes)	98	92	72	2.63 (0.10)	24.51(0.000002*)	12.23 (0.00047*)
Can antibiotic cure viral infections? (no)	55	24	3	18.83 (0.000015 *)	63.16(0.000000*)	17.13 (0.000036*)
Do you think the use of antibiotics will speed up the recovery of cold, cough? (no)	72	52	31	7.66 (0.0056*)	32.03(0.000000*)	8.24 (0.0041*)
Have you heard of antibiotics resistance? (yes)	93	93	44	0.77 (0.78)	53.39(0.000000*)	53.39 (0.000000*)
Do you think frequent use of antibiotics will decrease efficacy of treatment when using the antibiotic again? (yes)	97	96	55	0.00 (1.00)	46.08(0.000000*)	43.25 (0.000000*)
Is the efficacy better if the antibiotics are newer and more costly? (no)	60	55	57	0.33 (0.37)	0.08 (0.77)	0.02 (0.89)

ATTITUDE TOWARDS ANTIBIOTIC USE

The results showed that on the questions of attitude on antibiotic use, the Medical students scored significantly higher than the para medical students. This can be clearly explained with questions like 'Antibiotic resistance affects you and your family's health ?' correct response were more among medical students than the BPT who were just 21 correct responders. However, all the three groups responded agreed to the prevalence of antibiotic resistance. The results are shown in Table 2.

Table 2: Attitude of antibiotic use among C.R.R.I's, final years and paramedical students

Questions on knowledge of antibiotics (correct response)	Percentage of C.R.R.I with correct response	Percentage of final years with correct response	Percentage of paramedical with correct response	C.R.R.I Vs Final year Chi square value (P – VALUE)	C.R.R.I Vs paramedical Chi square value (P – VALUE)	Final year Vs paramedical Chi square value (P – VALUE)
There is abuse on antibiotics at present. (agree)	93	82	92	4.57 (0.033*)	0.00 (1.00)	3.58 (0.06)
Antibiotics resistance has become a problem (agree)	99	83	52	13.74 (0.0002*)	57.20 (0.00000*)	20.51 (0.000007*)
Abuse of antibiotics has become the main cause leading to bacterial resistance. (agree)	95	90	53	1.15 (0.28)	43.69 (0.00000*)	31.80 (0.00000*)
Antibiotic resistance affects you and your family's health. (agree)	92	91	21	0.00 (1.00)	99.68 (0.00000*)	96.61 (0.000000*)
Necessary to get more education about antibiotics. (agree)	94	97	92	0.47 (0.50)	0.077 (0.78)	1.54 (0.21)
Need to establish course on 'rational use of antibiotics' at university. (agree)	90	72	82	9.39 (0.002)	2.03 (0.15)	2.29 (0.13)
Necessary to carry out large-scale 'antibiotics campaign' promotion. (agree)	96	70	53	22.18 (0.000004*)	46.43 (0.000000*)	5.41 (0.02*)

PRACTICE AND BEHAVIOUR REGARDING ANTIBIOTIC USE:

The analysis of practice of antibiotic usage showed mixed response. For example, for the use of antibiotics when having fever with

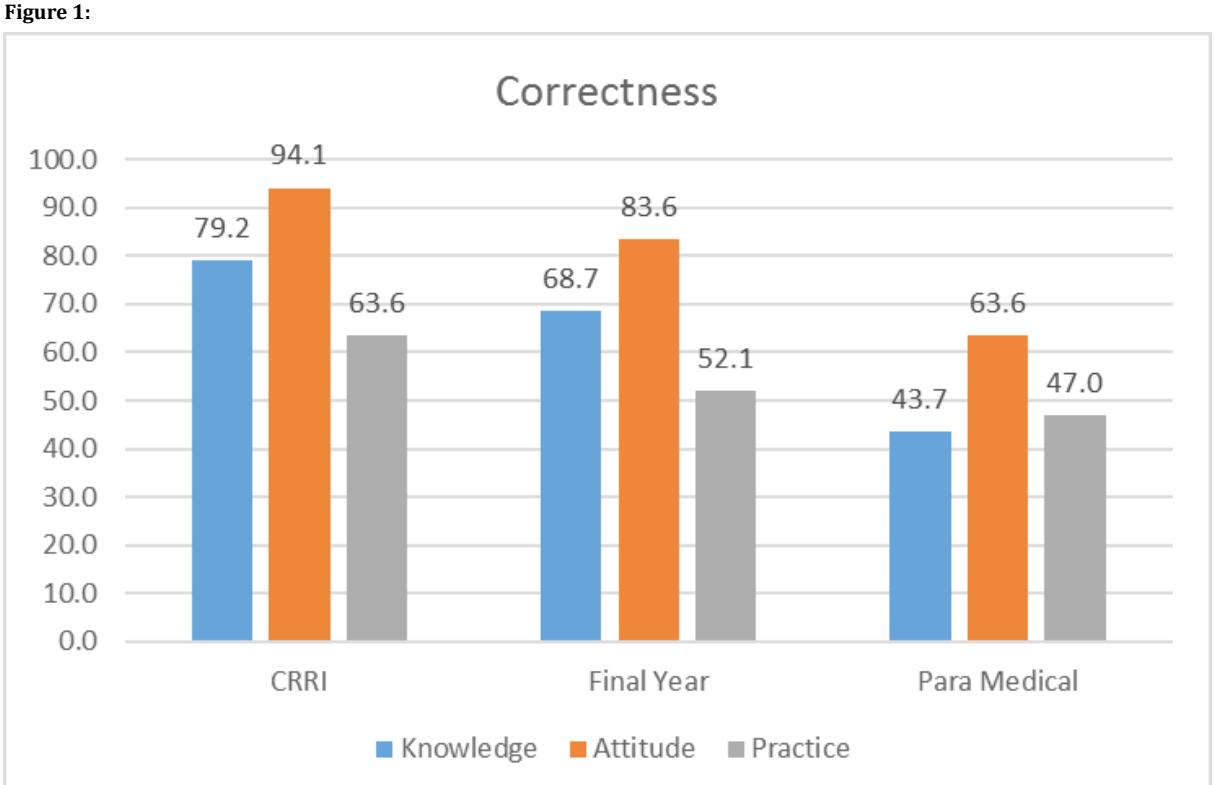
temperature lower than 38.5°, there was a poor response among all the three groups with(p value of 0.21, 0.11 , 0.86) . The similar poor responses were observed for parameters like use of 'antibiotics in common cold'. How ever, for the usage of antibiotics with cough associated with yellow or green sputum, there was a significant difference among medical students and para medical students and among them CRRIs(intern students) were more vigilant. The parameters are represented in table 3:

Table 3 : practice of antibiotics among C.R.R.I's, final years and paramedical students

Questions on using of antibiotics (correct response)	Percentage of C.R.R.I with correct response	Percentage of final years with correct response	Percentage of paramedicals with correct response	C.R.R.I Vs Final year Chi square value (P – VALUE)	C.R.R.I Vs paramedical Chi square value (P – VALUE)	Final year Vs paramedical Chi square value (P – VALUE)
Use antibiotics when having fever (temperature lower than 38.5°)	32	23	21	1.61 (0.21)	2.57 (0.11)	0.03 (0.86)
Common cold (always, often)	25	24	25	0.00 (1.00)	0.03 (0.87)	0.00 (1.00)
Acute bronchitis (always, often)	64	66	54	0.02 (0.88)	1.67 (0.20)	2.52 (0.11)
Coughing up yellow/green sputum (always, often)	83	77	56	0.78 (0.38)	15.95 (0.00007*)	8.98 (0.003*)
Sore throat (always, often)	72	62	55	1.83 (0.18)	5.52 (0.02*)	0.74 (0.39)
Cough with fever (always, often)	51	45	57	0.50 (0.48)	0.50 (0.48)	2.42 (0.12)
Congested nose with headache (always, often)	90	65	51	16.52(0.00005*)	34.72 (0.000000*)	3.47 (0.06)
Coughing up white sputum (always, often)	89	53	50	29.75 (0.000001*)	34.06 (0.000000*)	0.08 (0.78)
Cough lasting 2 weeks or more (always, often)	53	54	49	0.00 (1.00)	0.18 (0.67)	0.32 (0.57)
Asked doctors to prescribe antibiotics when you catch a common cold (yes)	77	52	52	12.58 (0.0004*)	12.58 (0.0004*)	0.02 (0.89)

The figure 1: shows the corrective response for knowledge, Attitude and practice of antibiotic usage among CRRIs, final year MBBS and BPT students.

Figure 1:



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DISCUSSION

This study analysed the Medical students and para medical students from a tertiary health care set up in Chennai to assess their knowledge, attitude and practice towards antibiotic use as a questionnaire based study. Medical students were better than physiotherapy students in terms of knowledge, attitude and practice on antibiotic use.

The result of knowledge component shows that medical students can get more information about antibiotics through literature and clinical practice than other students. The increase of knowledge can be well presented by the relative specialized question Like 'Do you think the use of antibiotics will speed up the recovery of cold, cough?' which is illustrated in the table as CRRIs (72). Final year MBBS (52) and BPT (31). Some similarity can be drawn from the study in Jordan in 2012 by Suaifan et al. and in 2011 by Shehadeh et al. that highlights existing gaps in the knowledge of MS and NS on antibiotics use [14, 15].

The response to attitude on antibiotics were much better among medical students than the para medical students. This is similar to the study done in france, which shows According to a research among 503 interns and senior physicians in France, 98% of physicians considered antibiotic resistance as a national problem(16).

Conclusions

This analysis of 300 Medical and para medical students reveals that the medical curriculum significantly improves students' knowledge on antibiotics and antibiotic-related usage.

The study also shows a lacking of knowledge among para medical syudents because of their meagre exposure to medical education, literature, usage and practice of antibiotics. This can be overcome by changes in the curriculum in the form of integrated teaching among medical and para medical students. This survey also truly shows some of potential causes of antibiotic resistance if its being prescribed for ordinary viral infections. To bring down the proliferation of antibiotic misuse and its subsequent effects, we suggest the establishment for specific work shop on rational prescription of antibiotics that stresses more on the behaviour of medical students towards antibiotics use rather than advance of knowledge alone.

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