A study on the Knowledge, Attitude & Practice of Antibiotic usage and resistance among Under graduate medical students in a rural medical college – questionnaire based study

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Abstract: *Antibiotic resistance (ABR) is considered to be a type of drug resistance where some or all populations of a bacterial species survive after exposure to antibiotics. [1]Antibiotics are the most frequently prescribed drugs, but they are often misused. This contributes to the spreading of resistant strains of bacteria. One of the causes for the antimicrobial misuse is linked to a wrong prescribing behavior amongst physicians. [2] The main factors are irrational drug use such as over prescription and unnecessary prescription of AB (such as for viral infections), incomplete treatments and self-medication as well as insufficient infection control measures to prevent spread of resistant bacteria both in the community and the hospital. [3] The objectives of the current study To assess knowledge and attitude concerning antibiotic resistance among under graduate medical student &to assess self-reported practices which are related to antibiotic usage.A non interventional prospective questionnaire based study was conducted among MBBS 2 nd year undergraduates and the collected questionnaires analysed.94.3 percent heard of antibiotic resistance and 35.2 percent sometimes prefer to take antibiotics when they have cold.This study concludes that MBBS undergraduates have good knowledge on antibiotic resistance*

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I. Introduction

Antibiotics are a class of drugs used to treat bacterial infection where they destroy bacteria (bactericidal) or prevent bacteria from multiplying (bacteriostatic). Antibiotic resistance (ABR) is considered to be a type of drug resistance where some or all populations of a bacterial species survive after exposure to antibiotics. [1]

Antibiotics are the most frequently prescribed drugs, but they are often misused. This contributes to the spreading of resistant strains of bacteria. One of the causes for the antimicrobial misuse is linked to a wrong prescribing behavior amongst physicians. [2]

Increasing resistance of bacterial pathogens to commonly used antibiotics (AB) has become a world-wide public health concern. Spread of antibiotic resistance (ABR) is causing not only increased morbidity and mortality but also a high economic burden, particularly in low resource settings. Health systems in low income countries which are already struggling with chronic underfunding and weak institutional structures are particularly hit by ABR. [3]

The main factors are irrational drug use such as over prescription and unnecessary prescription of AB (such as for viral infections), incomplete treatments and self-medication as well as insufficient infection control measures to prevent spread of resistant bacteria both in the community and the hospital. [3]

Various studies have described the inability of the prescribing physicians in creating awareness and providing adequate education to the patients regarding antibiotic usage. The lack of adequate training during their undergraduate and postgraduate years may be responsible for their inability to undertake these tasks confidently. [4]

The prescribing behavior of medical doctors plays a key role in the consumption of AB and is a potential tool for control and containment of ABR. Factors thriving prescribing behavior of medical doctors can be analyzed by so-called KAP-surveys, in which knowledge (K), attitudes (A) and practices (P) of prescribers are assessed. [5]

In addition, medical students are an important target group for sustainable AB prescribing intervention programs. [3] A better understanding of what the students know and believe about the issues of antimicrobial use and resistance can assist us in planning an effective educational intervention for them. [5]

In this regards, we decided to conduct a study among 2nd year undergraduate medical students to assess their knowledge and attitude concerning antibiotic resistance, as well as their self-reported practices which are related to antibiotic usage.The objectives of the current study To assess knowledge and attitude concerning antibiotic resistance among under graduate medical student &to assess self-reported practices which are related to antibiotic usage

II. Material And Methods

This prospective non interventional questionnaire based study was carried out on students of Department of Pharmacology at PES Institute Of Medical Sciences and Research,Kuppam,Andhra Pradesh fromOctober 2018 to December 2018. A total 105students (both male and females) of aged ≥ 18, years were for in this study.
Study Design: Prospective non interventional questionnaire based study
Study Location: This was a tertiary care teaching hospital based study done in Department of Pharmacology PES Institute Of Medical Sciences and Research,Kuppam,Andhra Pradesh.

Study Duration: October 2018 to December 2018.
Sample size: 105 students.
Subjects & selection method: The study population was drawn from MBBS Undergraduates attending pharmacology classes(V semester)

Inclusion criteria:
 MBBS Undergraduate Students who are willing to participate in the study after taking informed consent

Exclusion criteria:
1. MBBS Undergaduate Students of I and II semister.

Procedure methodology
After written informed consent was obtained, a well-designed questionnaire was used to collect the data about antimicrobial resistance from students of V semister. The questionnaire included about knowledge,attitude and practice of MBBS Undergraduates of V semister .

Statistical analysis
Descriptive cross sectional study analysis ,Data was be entered in Ms Excel 2007 and data analyzed by Stata 14 software . Category variables will be analyzed by using Mean ,Median and Continuous variables by Mean ,Standard deviation .For inferential analysis tests such as t-test ,X^2 – test (Chi-square test) applied .P value < 0.05will be considered statistically significant.

III. Result

The questionnaires collected from MBBS students(Vsemister) were analysed and the following results were obtained

Table 1:K1 - Antibiotics can kill "good bacteria" present in our body

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	14	13.3	13.3	13.3
TRUE	91	86.7	86.7	100.0
Total	105	100.0	100.0	

Table 2:K2 - Antibiotics can cause secondary infections after killing good bacteria present in our body

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	7	6.7	6.7	6.7
TRUE	98	93.3	93.3	100.0
Total	105	100.0	100.0	

Table 3:K3 - Antibiotics can cause allergic reactions

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	3	2.9	2.9	2.9
TRUE	102	97.1	97.1	100.0
Total	105	100.0	100.0	

Table 4:K4 - Have you ever heard about antibiotic resistance

	Frequency	Percent	Valid Percent	Cumulative Percent
NO	6	5.7	5.7	5.7
YES	99	94.3	94.3	100.0
Total	105	100.0	100.0	

Table 5:K5 - If taken too often, antibiotics are less likely to work in the future

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	5	4.8	4.8	4.8
TRUE	100	95.2	95.2	100.0
Total	105	100.0	100.0	

K6. Possible causes of antibiotic resistance

Table 6:K6.1 Indiscriminate and injudicious use of antibiotics

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	7	6.7	6.7	6.7
TRUE	98	93.3	93.3	100.0
Total	105	100.0	100.0	

Table 7:K6.2 Use of antibiotics for self-limiting infections

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	21	20.0	20.0	20.0
TRUE	84	80.0	80.0	100.0
Total	105	100.0	100.0	

Table 8:K6.3 Use of antibiotics with a broader than necessary spectrum

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	6	5.7	5.7	5.7
TRUE	99	94.3	94.3	100.0
Total	105	100.0	100.0	

Table 9:K6.4 Use of antibiotics for shorter than standard duration

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	39	37.1	37.1	37.1
TRUE	66	62.9	62.9	100.0
Total	105	100.0	100.0	

Table 10:K6.5 Use of antibiotics for longer than standard duration

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	30	28.6	28.6	28.6
TRUE	75	71.4	71.4	100.0
Total	105	100.0	100.0	

Table 11:K6.6 Empirical antibiotic therapy (best guess therapy)

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	36	34.3	34.3	34.3
TRUE	69	65.7	65.7	100.0
Total	105	100.0	100.0	

Table 12:K6.7 Mutational and evolutionary changes in the micro organism

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	6	5.7	5.7	5.7
TRUE	99	94.3	94.3	100.0
Total	105	100.0	100.0	

Table 13:K6.8 Lack of restrictions on antibiotic usage

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	7	6.7	6.7	6.7
TRUE	98	93.3	93.3	100.0
Total	105	100.0	100.0	

Table14:K6.9 Excessive antibiotic use in live stock (Animals reared for food)

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	43	41.0	41.0	41.0
TRUE	62	59.0	59.0	100.0
Total	105	100.0	100.0	

K7. Antibiotic Resistance is

Table 15:K7.1 An important and serious public health issue facing the World.

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	32	30.5	30.5	30.5
somewhat disagree	2	1.9	1.9	32.4
strongly agree	66	62.9	62.9	95.2
strongly disagree	1	1.0	1.0	96.2
Undecided	4	3.8	3.8	100.0
Total	105	100.0	100.0	

Table 16 K7.2 An important and serious public health issue in our Country.

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	41	39.0	39.0	39.0
somewhat disagree	1	1.0	1.0	40.0
strongly agree	57	54.3	54.3	94.3
undecided	6	5.7	5.7	100.0
Total	105	100.0	100.0	

Table17: K7.3 An important and serious public health issue in our Hospital

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	30	28.6	28.6	28.6
somewhat disagree	19	18.1	18.1	46.7
strongly agree	32	30.5	30.5	77.2
strongly disagree	1	1.0	1.0	78.1
Undecided	23	21.9	21.9	100.0
Total	105	100.0	100.0	

Table 18: K8. Antibiotics are effective in treating bacterial but not viral infections

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	19	18.1	18.1	18.1
TRUE	86	81.9	81.9	100.0
Total	105	100.0	100.0	

Table 19: K9. Antibiotics will speed up the recovery

	Frequency	Percent	Valid Percent	Cumulative Percent
FALSE	5	4.8	4.8	4.8
TRUE	100	95.2	95.2	100.0
Total	105	100.0	100.0	

Table20: A1. Decisions regarding the prescription of antibiotics should only be taken by a specialist doctor

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	24	22.9	22.9	22.9
somewhat disagree	9	8.6	8.6	31.4
strongly agree	62	59.0	59.0	90.5
strongly disagree	6	5.7	5.7	96.2
undecided	4	3.8	3.8	100.0
Total	105	100.0	100.0	

Table 21: A2. When I get fever, antibiotics help me to get better more quickly.

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	44	41.9	41.9	41.9
somewhat disagree	11	10.5	10.5	52.4
strongly agree	32	30.5	30.5	82.9
strongly disagree	7	6.7	6.7	89.5
undecided	11	10.5	10.5	100.0
Total	105	100.0	100.0	

Table 22:A3. Whenever I take an antibiotic, I contribute to the development of antibiotic resistance.

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	31	29.5	29.5	29.5
somewhat disagree	21	20.0	20.0	49.5
strongly agree	13	12.4	12.4	61.9
strongly disagree	23	21.9	21.9	83.8
Undecided	17	16.2	16.2	100.0
Total	105	100.0	100.0	

Table 23:A4. Skipping one or two doses does not contribute to the development of antibiotic resistance.

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	32	30.5	30.5	30.5
somewhat disagree	27	25.7	25.7	56.2
strongly agree	14	13.3	13.3	69.5
strongly disagree	23	21.9	21.9	91.4
Undecided	9	8.6	8.6	100.0
Total	105	100.0	100.0	

Table24:A5. Antibiotics are safe drugs , hence they can be commonly used.

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	30	28.6	28.6	28.6
somewhat disagree	37	35.2	35.2	63.8
strongly agree	10	9.5	9.5	73.3
strongly disagree	25	23.8	23.8	97.1
undecided	3	2.9	2.9	100.0
Total	105	100.0	100.0	

Table 25:A6. When I have a cold, I should take antibiotics to prevent getting a more serious illness.

	Frequency	Percent	Valid Percent	Cumulative Percent
somewhat agree	22	21.0	21.0	21.9
somewhat disagree	32	30.5	30.5	52.4
strongly agree	10	9.5	9.5	62.0
strongly disagree	35	33.3	33.3	95.3
undecided	6	5.7	5.7	100.0
Total	105	100.0	100.0	

A7. The Doctor prescribes a course of antibiotic for you. After taking 2–3 doses you start feeling better.
Table 26: A7.1 Do you stop taking the further treatment?

	Frequency	Percent	Valid Percent	Cumulative Percent
Always	5	4.8	4.8	4.8
Never	42	40.0	40.0	44.8
Seldom	11	10.5	10.5	55.2
Sometimes	35	33.3	33.3	88.6
Usually	12	11.4	11.4	100.0
Total	105	100.0	100.0	

. **Table 27: A7.2** Do you save the remaining antibiotics for the next time you get sick?

	Frequency	Percent	Valid Percent	Cumulative Percent
always	6	5.7	5.7	5.7
never	38	36.2	36.2	41.9
seldom	17	16.2	16.2	58.1
sometimes	26	24.8	24.8	82.9
usually	18	17.1	17.1	100.0
Total	105	100.0	100.0	

Table 28:A7.4 Do you discard the remaining, leftover medication?

	Frequency	Percent	Valid Percent	Cumulative Percent
always	3	2.9	2.9	2.9
never	56	53.3	53.3	56.2
seldom	9	8.6	8.6	64.8
sometimes	19	18.1	18.1	82.9
usually	18	17.1	17.1	100.0
Total	105	100.0	100.0	

Table 29:A7.5 Do you give the leftover antibiotics to your friend/roommate if they get sick?

	Frequency	Percent	Valid Percent	Cumulative Percent
always	11	10.5	10.5	10.5
never	14	13.3	13.3	23.8
seldom	9	8.6	8.6	32.4
sometimes	30	28.6	28.6	61.0
usually	41	39.0	39.0	100.0
Total	105	100.0	100.0	

Table 30:A7.6 Do you complete the full course of treatment

	Frequency	Percent	Valid Percent	Cumulative Percent
always	33	31.4	31.4	31.4
never	11	10.5	10.5	41.9
seldom	8	7.6	7.6	49.5
sometimes	23	21.9	21.9	71.4
usually	30	28.6	28.6	100.0
Total	105	100.0	100.0	

Table 31:A8. Do you usually take antibiotics after a simple phone call with your doctor without a proper medical examination?

	Frequency	Percent	Valid Percent	Cumulative Percent
always	4	3.8	3.8	3.8
never	41	39.0	39.0	42.9
seldom	8	7.6	7.6	50.5
sometimes	41	39.0	39.0	89.5
usually	11	10.5	10.5	100.0
Total	105	100.0	100.0	

Table 32A9 Do you check the expiry date of the antibiotic before using it?

	Frequency	Percent	Valid Percent	Cumulative Percent
always	89	84.8	84.8	84.8
Never	1	1.0	1.0	85.7
seldom	1	1.0	1.0	86.7
sometimes	4	3.8	3.8	90.5
usually	10	9.5	9.5	100.0
Total	105	100.0	100.0	

Table 33: A10 Do you prefer to take an antibiotic when you have cough and sore throat?

	Frequency	Percent	Valid Percent	Cumulative Percent
always	15	14.3	14.3	14.3
Never	23	21.9	21.9	36.2
seldom	14	13.3	13.3	49.5
sometimes	37	35.2	35.2	84.8
usually	16	15.2	15.2	100.0
Total	105	100.0	100.0	

Table 34: A11 Have you used antibiotics in the past year?

	Frequency	Percent	Valid Percent	Cumulative Percent
NO	13	12.4	12.4	12.4
YES	92	87.6	87.6	100.0
Total	105	100.0	100.0	

IV. Discussion

Anti biotic resistance is a serious issue all over the world.in a country like india ,it has higher prevalence due to indiscriminate use of antibiotics. The questionnaires given to the students were collected and analysed using SPSS software.aaccording to our study ,93.3 percent of MBBS students stongly agreed that antibiotics can cause secondary infections after killing good bacteria in our body where as it is 79.5 percent in study reported by Guaicoma etal.81.9 percent have reported that antimicrobials are not appropriate for viral infections compared to 83.2 percent reported by guaicoma et al.[2]

86.7 percent agreed that anti biotics can kill good bacteria present in our body compared to 90.2 percent in guaicoma et al .97 percent agreed that antibiotics can cause allergic reactions compared to 96.4 percent in guaicoma et al .94.3 percent know about antibiotic resistance compared to 93.9 percent in Guaicoma et al.93.3 percent agreed that anti microbial misuse leads to antibiotic resistence compared to 98 percent with Guaicoma et al.40 percent never stopped taking drugs even after the symptoms reduced compared to 15 percent with Guaicoma et al.[2]

80 percent agree that use of antibiotics for self limiting infections is a possible cause for antibiotic resistence compared to 56.7 percent withThreimer et al.94.3 percent agree that use of antibiotics with broader spectrum is responsible for antibiotic resistence compared to 69 percent with Threimer et al.71.4 perccent agree that use of antibiotics for lomger than standard duration lead to antibiotic resistence compared to 49.5 percent with Threimer et al . 59 percent agree that excessive use of antibiotics in live stock causes anti biotic resistence compared to 54.6 pecent with Threimer et al.94,3 percent agree that mutation and evolutionary changes in the micro organisms are responsible for antibiotic resistance compared to 79.4 percent with Threimer et al.65,7 percent agree that empirical antibiotic therapy lead to antibiotic resistance compared to 41.2 percent with Threimer et al.[3]

93.3 percent agree that lack of restrictions on antibiotic use lead to antibiotic resistance compared to 78.3 percent in Threimer et al.[3]

40 percent never stopped taking the further antibiotic course compared to 55.6 percent with Threimer et al. 36.2 percent never save thee remaining antibiotics for next time when they get sickcompared to 58.8 percent in Threimer et al. 53.3 percent never discard the remaining left over medication compared to 37 percent with Threimer et al . 39 percent usually give left over antibiotics to their friend if they get sick compared to 86.6 percent with Threimer et al . then 31.4 percent always complete full course of treatment compared to 74.2 percent with Threimer et al .84.8 percent check the expiry date before using antibiotics compared to 86.6 percent with Threimer et al .35.2 percent preferred to take antibiotics when they have cough or sore throat compared to 40.2 percent with Threimer et al.[3]

20.8 percent agree that skipping of one or two antibiotic dose will not contribute to anti biotic resistance compared to 22.7 percent with ithe Anirban et al.10.6 percent agree that antibiotics are saf drugs compared to 43.9 percent with Anirban et al.[5]

The above data indicates that in our study better results were seen.

V. Conclusion

The MBBS undergraduates have better knowledge regarding antibiotic resistance.being health care professionals they have to do rational prescription in future.

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