

A survey on the knowledge, attitude, and practices about antibiotic usage and resistance among homeopathic general practitioners

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Received: 30 September 2018

Accepted: 12 October 2018

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ABSTRACT

Background: Antimicrobial resistance (AMR) is an urgent and serious global health problem, demanding considerable attention from health care providers (HCPs) all over the world. The threat is progressing rapidly and intensifying with time. Therefore study was conducted to assess the knowledge, attitude and practices of Homeopathic HCPs about antibiotic usage and resistance (ABR).

Methods: Cross-sectional, observational study. The data was collected from 75 Homeopathic HCPs practicing in Maharashtra with prior informed consent. Questionnaire based study whose responses were assessed by using five point Likert scale and analysed by using appropriate descriptive statistics.

Results: 68 (90.67%) respondents agreed that antibiotics are overused in India and 70 (93.33%) of them facing ABR in their daily practices. Only 62 (82.7%) of them were aware of the fact that bacteria are not responsible for causing colds and flu. 33 (44%) believe that skipping one or two doses of antibiotic does not contribute to ABR. Only 23 (30.67%) knew drug schedule H correctly. 22 (29.33%) opined that antibiotics should be discontinued if patient develops mild gastrointestinal side effects. Only 28 (37.33%) reads patient information leaflet (PIL) and counsel patients accordingly. 28 (38.67%) feel that they don't have enough sources of antibiotic information and 35 (46.67%) find it difficult to select appropriate antibiotic.

Conclusions: Most of HCPs were aware of rising issue antibiotic resistance. However, their knowledge, attitude and practices were found to be a matter of some concern. Educational intervention can be introduced to bring about behaviour changes regarding rational antibiotics prescribing. Government should take initiative against overt antibiotic promotional advertisements and to curb over the counter (OTC) sell of antibiotics.

Keywords: Antibiotic resistance, Homeopathy HCPs, Over the counter, Rational prescribing

INTRODUCTION

Antimicrobial resistance (AMR) is the ability of a microorganism to resist the effects of medication which are previously used to treat them. It is on rise nowadays and possesses a hazard for the entire healthcare service system. It is an urgent and serious global health problem, demanding considerable attention from health care professionals all over the world. The major chunk of the

problem persists in the developing countries. India tops in the irrational and indiscriminate use of antimicrobials.¹ The threat is progressive rapidly and intensifying with the time. In 2011, on World Health Day, WHO set the theme as "Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow".² This shows the importance of the issue of antibiotic resistance. It is important to think about various approaches, to meet the challenges and to tackle the problem. It is necessary to undertake campaigns among the general population as well as among the health care

personnel about antibiotic resistance and its consequences and regarding the methods which can control its development as well as spread.³ One of the important causes leading to antibiotic resistance is irrational practices of healthcare professionals and indiscriminate use of antibiotics.⁴ Unnecessary and overprescribing is widely prevalent.⁵ It is basically driven by patient demand, uncertainty about diagnosis, and time pressure on clinicians. One of the best ways to control resistance is rational use of antibiotic.⁶ Various studies have shown the inability of the physicians in creating awareness and providing adequate education to the general population regarding antibiotic usage.⁷

India, being the country with high infectious disease burden, antibiotics are the most widely and frequently prescribed drugs accounting for the alarming increase in AMR.⁸ The irrational prescription practices by clinicians are mainly governed by the “more drug better doctor” beliefs of patients. Free unchecked over the counter (OTC) availability of antibiotics for human, animal and industrial consumption, self medication, lack of knowledge, unjustified demand for antibiotics prescription and unawareness regarding antibiotic resistance are other factors that add up to the current degrading situation. The general practitioners belong to a group of medical professionals and their knowledge, attitude and behavior in relation to public usage of antibiotics can greatly impact in the future on antibiotic-related issues.

To curb this emerging horizon of AMR a national antibiotic policy was developed, national surveillance database for antibiotic use was established and national centre for disease control (NCDC) is designated as the focal point for AMR in the country.^{9,10} Though these well-structured interventional strategies are still in infancy, it has started yielding positive changes at national and community level. However, something more specific and directed needs to be done at individual level that influences health related behaviour. While knowledge plays a significant role in providing an insight about the problems faced, it is the beliefs and attitude that matters most in directing the desired behavioural change. Ultimate aim of all these interventions is to bring out attitude and behavioural changes at the very grass-root level. A strong foundation is of utmost importance for a durable construction hence we need to strengthen the base of the health care system by nipping the problem of resistance in the bud itself. So, this study was undertaken among homeopathic general practitioners practicing homeopathic medicine since long from various districts of Maharashtra, India in order to assess their knowledge and attitude concerning antibiotic resistance and self-reported practices which are related to antibiotic usage.

METHODS

A cross-sectional, observational questionnaire based study was carried out after approval from the Institutional Ethics Committee (BJGMC/IEC/ Pharmac/ND-Dept

1217262-262) was obtained before initiating the study. It was conducted for 2 months of period from 01st Oct 2017 to 31st Nov 2017 at B.J. Government medical college in Pune.

Questionnaire based cross sectional survey was undertaken among general homeopathic practitioners practicing in different regions of Maharashtra. The questionnaire was validated by subject experts for its content and relevance prior to the start of the study. Then questionnaire was distributed to 75 general homeopathic practitioners of Maharashtra who were doing one year MUHS certified “Certificate Course in Modern Pharmacology”. They were asked to complete the questionnaire anonymously. Informed consent was taken from the participants.

Analysis of data

All responses collected were analysed for various parameters like knowledge, attitude and practices about antibiotic usage and resistance among Homeopathic healthcare providers by using questionnaires as mentioned in case record form.

Homeopathic practitioners who were practicing since long in different regions of Maharashtra who have enrolled for MUHS officiated one year certificate course in modern pharmacology was given case record form after taking informed consent. Anonymity of participants was maintained. Students from batch 2016-17 who have finished their one year of course and students pursuing i.e. batch 2017-18 were enrolled for the study.

They were given self-developed questionnaires consisting of closed ended and few open-ended types of questionnaires. Total of 33 questions were provided to participants. Data record form consisted of questions of yes/no, true/false, strongly agree/strongly disagree scale and always/usually/never type.

Responses were recorded in Microsoft excel 2010 and analysed by using appropriate descriptive statistical tests.

RESULTS

The age range of the practitioners ranged from 55.1 ± 6.175 years (mean \pm SD). Male predominance was found over females. The mean clinical practice of the general practitioners ranged from 29.32 ± 6.342 years. (mean \pm SD). 68 (90.67%) respondents agreed that antibiotics are overused in India and 70 (93.33%) of them facing antibiotic resistance (ABR) in their daily practices. 35 (46.67%) find it difficult to select appropriate antibiotic. Only 62 (82.7%) of them were aware of the fact that bacteria are not responsible for causing colds and flu. 33 (44%) believe that skipping one or two doses of antibiotic does not contribute to ABR (Table 1). Only 23 (30.67%) knew drug schedule H correctly. 22 (29.33%) opined that antibiotics should be discontinued if patient develops mild

gastrointestinal side effects. Only 28 (37.33%) read patient information leaflet (PIL) and counsel patients accordingly.

28 (38.67%) feel that they don't have enough sources of antibiotic information and (Table 1).

Table 1: Evaluation of knowledge, attitude about antibiotic resistance in homeopathy GPs.

Question	St. agree	Agree	Neutral	Disagree	St. disagree	Total
Antibiotics are overused	36(48%)	32(42.67%)	4(5.33%)	2(2.67%)	1(1.33%)	75
Difficult to select correct antibiotic	4(5.33%)	31(41.33%)	22(29.33%)	15(20%)	3(4%)	75
Antimicrobial does not cause damage when no indicated	8(10.67%)	16(21.33%)	3(4%)	35(46.67%)	13(17.33%)	75
Antimicrobial resistance is a problem in daily practice	24(32%)	46(61.33%)	3(4%)	2(2.67%)	0	75
Antibiotics when patients have cold	0	4(5.33%)	9(12%)	42(56%)	20(26.67%)	75
Antibiotics when patients have fever	2(2.67%)	21(28%)	5(6.67%)	39(52%)	8(10.67%)	75
Skipping 1/2 doses does not contribute to antibiotic resistance	4(5.33%)	29(38.67%)	5(6.67%)	32(42.67%)	5(6.67%)	75
Antibiotics are safe drugs	2(2.67%)	4(5.33%)	4(5.33%)	37(49.33%)	28(37.33%)	75
Antibiotic in patients with cough and sore throat	9(12%)	10(13.33%)	32(42.67%)	7 (9.33%)	17(22.67%)	75
Follows instructions mentioned in package insert/ Patient information leaflet	28(37.33%)	19(25.33%)	19(25.33%)	6 (8%)	3(4%)	75
Chloramphenicol eye drop in patient of mild conjunctivitis	3(4%)	11(14.67%)	25(33.33%)	6 (8%)	30(40%)	75

Table 2: Evaluation of practices about antibiotic resistance in homeopathy GPs.

Question	Yes	No	Sometimes/uncertain	Total
Prescribing antibiotics	74(98.67%)	1(1.33%)	0	75
Sources of information about antibiotics when needed	46 (61.33%)	29 (38.67%)	0	75
Sending body fluids for Antibiotic C/S test	46 (61.33%)	10 (13.33%)	19 (25.33%)	75
Prescribing antibiotics after C/S test	35 (46.67%)	8 (10.67%)	32 (42.67%)	75
Counsel patient to clean hands before and after application of topical antibiotics	65 (86.67%)	4 (5.33%)	6 (8%)	75
Stoppage of Antibiotic if patient develops mild GI side effect	22 (29.33%)	53 (70.67%)	0	75

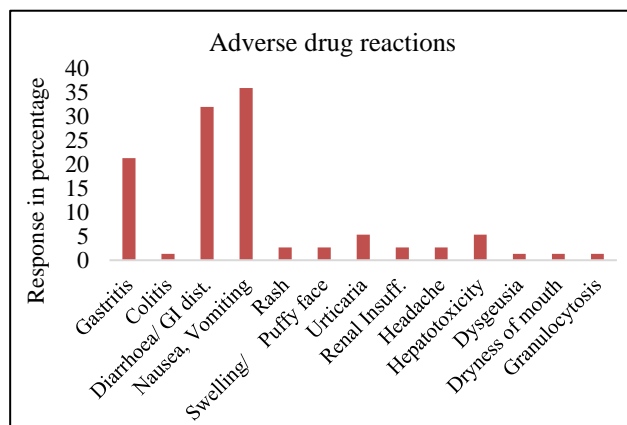


Figure 1: Response of the practitioners to adverse drug reactions of azithromycin.

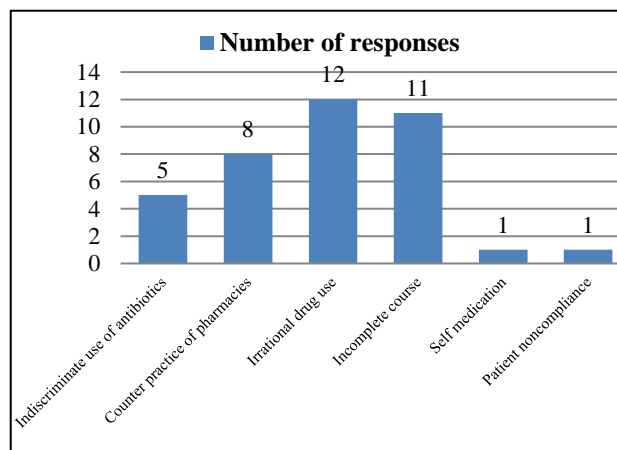


Figure 2: Reasons of antibiotic resistance by GPs.

Almost 99% GPs prescribe antibiotics in their clinical practice but only 61% sends body fluids like blood, urine, stool sample for culture sensitivity and out of them only 47% GPs prescribe antibiotic after verifying C/S report (Table 2). 87% of GPs counsel their patients about hygienic requirements for topical application of Antibiotics like using clean hands and application on dry, non-moist surface (Table 2).

The response rate to the question of sources of information on antibiotics was only 28%. The homeopathy general practitioners find CME (9.33%), Medical Bulletins (5.33%), Medical Representatives (5.33%), Journals (2.66%), Conferences (2.66%), Modern Pharmacology Certified Course (2.66%) as sources of information about antibiotics. 27 practitioners believed that nausea and vomiting is the most common adverse drug reaction seen with Azithromycin. 24 of these practitioners were of the opinion that diarrhoea and gastrointestinal disturbance were common adverse events recorded with Azithromycin. 16 practitioners said that gastritis was the most common adverse reaction noted with Azithromycin. 4 of the practitioners agreed with hepatotoxicity. Remaining few practitioners were of the opinion that the most common adverse drug reactions were rash, urticarial, dysgeusia, dryness of mouth, granulocytosis, puffy face and colitis (Figure 1). 12 practitioners among the 75 opined that irrational drug usage is the most common cause of antibiotic drug resistance. 11 of them said that incomplete course of the antibiotics is the most common cause. 8 of the practitioners blamed the counter practice of pharmacists as the most common cause of AMR. Only few said that non-compliance of the patient or self medication could be one of the many causes of AMR (Figure 2).

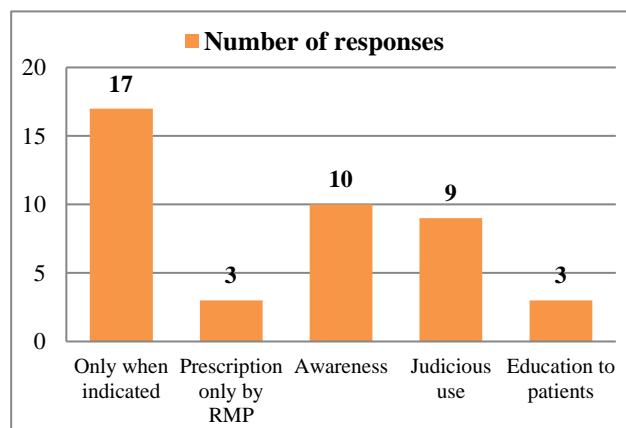


Figure 3: Solutions to antibiotic resistance by GPs.

To tackle these causes of ABR, 17 practitioners suggested that drugs should only be given when indicated. 10 of the total practitioners said that awareness should be the main moto for tackling the AMR. 9 respondents were of the view that AMR can be minimised with the help of judicious use of antibiotics. Only 3 of them stated that prescription should be given by registered medical practitioner only. 3 other practitioners believed that

education to the patients can help in combating the issue of AMR (Figure 3).

DISCUSSION

This study surveyed the knowledge, attitude and practice towards antibiotic use and ABR in homeopathic general practitioners. Our findings showed how the practitioners had a fair good knowledge about the role of antibiotics and related adverse reactions and the causes leading to antimicrobial resistance. The study suggests that there is an urgent need of awareness and educational interventions to tackle the problem of AMR.

All the participants responded to the questionnaire. So, the response was 100%. 98.67% of the homeopathic general practitioners prescribed antibiotics in their daily practice. 48% of the practitioners were aware of the indiscriminate use of antibiotics in hospitals in India. 61.33% experienced ABR in their daily practice which reflects the seriousness of the problem. 52% of the respondents strongly believed that antibiotics don't help in making the patient better in fever. Majority of the general practitioners (49.33%) opined that antibiotics are not safe drugs and hence should not be used commonly in daily practice. This is similar to Gupta RK et al, study.¹¹ 89.33% of the practitioners insisted on full completion of full course of treatment. This shows their knowledge and attitude towards AMR. 53% of practitioners considered about rationality before prescribing an antibiotic. This is similar to the study conducted by Khanna S et al.¹² 83% of the participants were knowledgeable of the fact that bacteria were not responsible for causing cold and flu which is much more than Padmanabha TS et al, and Afzal et al, study.¹³ Only 17% of practitioners considered prescription of antibiotics for cough and sore throat unnecessary. 84% of the practitioners ask their patients to check for expiry date of the antibiotics before using them. 47% of the practitioners considered prescribing antibiotics after culture sensitivity test. Interactive learning between pharmacology and microbiology helps in rational antimicrobial prescribing behaviour with infection control. Since antibiotic resistance among pathogenic microorganisms is a matter of worldwide concern, the prescribers should know the microorganism sensitivity pattern before prescribing it.¹⁴

Simple measures like hand washing in the control of resistance should be encouraged and its practice should be started at an earlier stage of the medical profession.¹³

The attitude of the study participants with regards to antibiotic use and resistance was found to be satisfactory. Previous studies have shown that about 60% and more of their participants believed that antibiotics should be prescribed during cold of viral etiology.¹⁵ Such wrong and blind beliefs may lead to inappropriate antibiotic consumption, which in turn result in the bacterial resistance because of irrational approach.¹⁶ Among the positive attitude, majority agreed for the need of campaign to create awareness among the population as well as health

care professional. To combat growing problem of antibiotic resistance, spreading awareness was also reported by Mahajan M et al, Gupta RK et al, and Sharma S et al.^{17,18}

Education interventions using clinical problems which depicts the hazardous effects of antibiotic resistance, can be used to improve as well as make them alert on present and future consequences, which encourages the correct usage of antibiotics by avoiding the resistance conquering the whole world.¹⁹

Health professionals are key to any country's health status, hence it's important to take necessary steps for developing proper knowledge, attitude and practices among them regarding antibiotic resistance.¹²

CONCLUSION

Most of HCPs were aware of rising issue antibiotic resistance. However, their knowledge, attitude and practices were found to be a matter of some concern. Educational intervention can be introduced to bring about behaviour changes regarding rational antibiotics prescribing. Government should take initiative against overt antibiotic promotional advertisements and to curb over the counter(OTC) sell of antibiotics.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee (BJGMC/IEC/Pharmac/ND-Dept 1217262-262)

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Cite this article as: Magar YB, Hiray RS, Gadhade JB, Ghongane BB. A survey on the knowledge, attitude, and practices about antibiotic usage and resistance among homeopathic general practitioners. *Int J Basic Clin Pharmacol* 2018;7:2112-21.

Annexure 1

APPENDIX 1: - CASE RECORD FORM

Date- __/__/2017

CASE RECORD FORM

TITLE OF PROJECT: “A survey on the knowledge, attitude, and practices about antibiotic usage and resistance among homeopathic general practitioners.”

I'm carrying out a study on “**A survey on the knowledge, attitude, and practices about antibiotic usage and resistance among homeopathic general practitioners**” You are part of a representative sample for my study. I would be very grateful if you would be so kind to take part in my study answering the following questions. Please answer them spontaneously and openly. Leave blank those you are not able to answer. Your answers will of course remain completely anonymous and will be only statistically reported and not singularly. As a principal investigator I take full responsibility for this.

QUESTIONNAIRE:

Demographic data:

Name-(optional)..... Age-.....yrs Sex-.....

Designation-..... In Clinical Practice (Since)-.....yrs

Address-.....

Sr No	Question	Answer
1	Do you prescribe antibiotics?	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	How frequently do you prescribe antibiotics in your clinic/hospital?	<input type="checkbox"/> More than once a day <input type="checkbox"/> Once a day <input type="checkbox"/> 3-5 times per week <input type="checkbox"/> 1-2 times per week <input type="checkbox"/> Less than once a week
3	Do you think you have enough sources of information about antibiotics when you need it?	<input type="checkbox"/> Yes <input type="checkbox"/> No, should be more sources of information (please specify which sources do you think would be useful):
4	Antibiotics are overused in clinics/hospitals in India	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
5	I believe it is difficult to select the correct antibiotic	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
6	Do you think efficacy of antibiotic is better if they are of recent origin and costlier	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree

7	When I decide which antibiotic to use, my selection is more affected by the expiration date/availability than the cause of the infection.	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
8	Do you believe that prescribing antimicrobial does not cause damage when patients do not need them?	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
9	Do you think that currently antimicrobial resistance is a problem in your daily practice?	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
10	Which one of the following antibiotics may be safe during pregnancy?	<input type="checkbox"/> Amoxicillin <input type="checkbox"/> Ciprofloxacin <input type="checkbox"/> Gentamicin <input type="checkbox"/> Clindamycin
11	Antimicrobial resistance means that if they are taken too often, antimicrobials are less likely to work in the future?	<input type="checkbox"/> True <input type="checkbox"/> False <input type="checkbox"/> Uncertain
12	Bacteria cause common cold and influenza?	<input type="checkbox"/> True <input type="checkbox"/> False <input type="checkbox"/> Uncertain
13	Do you think that ineffective treatment with growing problem of resistance can occur due to indiscriminate and injudicious antimicrobial use?	<input type="checkbox"/> True <input type="checkbox"/> False <input type="checkbox"/> Uncertain
14	Do you prescribe antibiotics to prevent getting a more serious illness, when patients have a cold?	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
15	When patients get fever, antibiotics help them to get better more quickly?	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
16	Skipping one or two doses does not contribute to the development of antibiotic resistance	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
17	Antibiotics are safe drugs, hence they can be commonly used	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Neutral <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree
18	The Doctor prescribes a course of antibiotic for a patient. After taking 2–3 doses he starts feeling better.	
	1) He should stop taking the further treatment?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
	2) He should complete the full course of treatment?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never

19	Do you check the rationality before starting an antibiotic?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
20	Do you ask patients to check the expiry date of the antibiotic before using it?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
21	Do you prefer to prescribe antibiotic when patients have cough and sore throat?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
22	Is it necessary to carry out large scale antibiotics campaign promotion to create awareness among the population and health care professional	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
23	Do you know antibiotic culture sensitivity (C/S) test?	<input type="checkbox"/> Yes <input type="checkbox"/> No
a)	If yes, do you send the sample of body fluids for C/S test?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes
24	Do you prescribe antibiotic after doing culture sensitivity test?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes
25	Do you prefer prescribing low cost generic drug over branded drugs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes
26	How commonly do you use Fixed Dose Combinations antibiotics?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
27	While prescribing topical antibiotics do you tell patient to clean hands before and after application at site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes
28	Do you prescribe Chloramphenicol eye drop for patient of mild conjunctivitis?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
29	Do you read, follow and tell or counsel patients to obey instructions mentioned in package insert/ Patient information leaflet?	<input type="checkbox"/> Always <input type="checkbox"/> Usually <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom <input type="checkbox"/> Never
30	Do you of the opinion that antibiotic should be stopped if patient develops mild gastrointestinal side effect?	<input type="checkbox"/> Yes <input type="checkbox"/> No
31	Enlist most common adverse effects of Azithromycin?

Q. 32. Which of the following is true for schedule H drugs?

- a) To be sold by retail on the prescription of registered medical practitioner only.

- b) It is dangerous to take this preparation except in accordance with the medical advice. Not to be sold by retail without prescription of a registered medical practitioner.
- c) It is dangerous to take this preparation except under medical supervision.
- d) I have no idea.

Q. 33. What do you think is the cause of antibiotic resistance? Can you suggest few solutions for same to tackle the growing problem of antimicrobial resistance?

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Thank you very much for filling the survey.

Signature and Name of Investigator:

(Dr. Yogesh B. Magar)