University Journal of Medicine and Medical Specialities

ISSN 2455- 2852 2018, Vol. 4(5)

A CROSS SECTIONAL STUDY TO ASSESS THE KNOWLEDGE AND PERCEPTION OF RATIONAL USE OF ANTIBIOTICS AMONG GENERAL MEDICAL PRACTITIONERS IN VELLORE, TAMIL NADU - 2016

AJITHA K M

Department of PUBLIC HEALTH,MADRAS MEDICAL COLLEGE AND GOVERNMENT GENERAL HOSPITAL

ABSTRACT:

Antimicrobial resistance is a major public health problem globally in this post antibiotic era. Antimicrobial resistance occurs naturally, but misuse and overuse of antibiotics in humans and animals is accelerating the process. This not only leads to increase in morbidity and mortality but also a great economic burden especially in developing countries. In countries where antibiotics can be bought without a prescription, emergence and spread of resistance is made worse. Similarly, in countries without standard treatment guidelines, antibiotics are often over-prescribed by health workers and over-used by the public. Hence this study aims to assess the knowledge and perception of rational use of antibiotic among general practitioners, whose individual treatment pattern is not usually monitored.

METHODS: A cross sectional study was conducted among general practitioners in Vellore using self-administered semi structured questionnaire.

RESULTS: Among 134 participants, 83 (61.9%) were males and 51 (38.1%) were females. The mean age was 44.85 (SD 12.94) years. 75(56%) were having post-graduation degree.29.9% of the participants had good knowledge about antibiotics.76.9% had acceptable level of perception about rational use of antibiotics.

KEYWORDS: Rational use of antibiotics, antimicrobial resistance, Knowledge, Perception, Registered medical practitioners.

INTRODUCTION

WHO (1985) defines, Medicine use is rational when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community1.Increasing resistance of bacterial pathogens to commonly used antibiotics has become a world-wide public health concern. Spread of antibiotic resistance is causing not only increased morbidity and mortality but also a high economic burden. Health systems in low income countries which are already struggling with chronic underfunding and weak institutional structures are particularly hit by antibiotic resistance1. It has been demonstrated that the level of antibiotic use correlates with the level of antibiotic resistance. Accordingly, it is important to keep the level of antibiotic prescribing low in order to contain the development of resistant bacteria2. The prescribing behaviour of medical doctors plays a key role in the consumption of antibiotics and have an individual and very constant pattern of prescribing antibiotics, and it seems that the diagnoses are often given to justify the treatment, rather than the other way around". Some other studies concluded that a high frequency of prescriptions of antibiotics may reflect a general disposition among GPs to give priority to maintaining good relations with the patients4. Important factors identified for antibiotic prescriptions by doctors were diagnostic uncertainty, perceived demand and expectation from the patients, practice sustainability and financial considerations, influence from medical representatives and inadequate knowledge5. Study also identified certain patient behaviour characteristics and laxity in regulation for prescribingand dispensing of antibiotics as aggravating the problem of antibiotic misuse. Interventions like Continuing Medical Educations for doctors, increasing awareness among patients, shared decision making and stricter rules and regulations were suggested to promote rational use of antibiotics in the community5. Irrational use of drugs can have impact on:

(i)Reduction in the quality of drug therapy leading to increased morbidity and mortality

(ii) Waste of resources leading to reduced availability of other vital drugs and increased costs

(iii) Increased risk of unwanted effects such as adverse drug reactions and the emergence of drug resistance.

(iv).Psycho social impacts, such as when patients come to believe that there is "a pill for every ill." This may cause an apparent increased demand for drugs6. Surveillance of antibiotic use is one of the strategies to guide control of antibiotic overuse or misuse. Based on the country- or region-specific data on pattern of antibiotic use, policy and guidelines for rational use of antibiotics should be prepared and implemented strictly. Quality assurance programme and public campaigns have been developed and launched in Europe to improve the use of antibiotics in primary care. The positive effects reported with these projects suggest that their implementation in other countries with high antibiotic prescribing may be effective5. In India, there is an urgent need to develop and implement treatment guidelines at primary care settings for rational use of antibiotics.

OBJECTIVES

1. To assess the knowledge and perception of rational use of antibiotics among general medical practitioners in Vellore, Tamil Nadu–2016."

2. To assess the Socio demographic factors influencing the knowledge of rational use of antibiotics among them.

JUSTIFICATION

The emergence of bacterial strains resistant to antimicrobial agents presents a growing concern worldwide. Among other factors, the irrational use of antibiotics has contributed to the progressive loss of bacterial sensitivity to antibiotics and spreading of resistant strains of bacteria, with substantial clinical and economic impact. Appropriate use of drugs is an essential element in achieving quality of health and medical care for patients and the community. Only a very few studies have been conducted on the rational use of antibiotics in India.

MATERIALS AND METHODS

A cross sectional study was conducted among general medical practitioners in Vellore during the period of January 2016 to February 2016. The sample size was calculated based on the findings of a study done **in Delhi among Primary care physicians in 2008, where the overall prevalence of rational use of antibiotics for acute uncomplicated respiratory infection in private clinics was 43.3%3**. Considering Confidence level of 95%, relative precision of 20% with 10% excess sampling to account for non- response, the sample size derived is 139. Sample size is calculated using the formula: N = Z 1-a 2pq/d2 Where, Z 1- a=standard normal deviant at 95% confidence level i.e. 1.96 p = prevalence of rational use of antibiotics for acute uncomplicated respiratory infection in private clinics = 43.3%

q = 100-p

d = relative precision of 20%.

N = (1.96)2 * 43.3* 56.7/ (8.66)2 = 125.76~ 126

Allowing a 10% non-response rate the sample size comes around 139. Non Probability Purposive sampling was used. Allopathic doctors who completed MBBS/PG in any speciality practising in Vellore either in government or private settings who gave written consent were included in the study. AYUSH doctors practicing allopathy were excluded from the study. Self administered Semi-Structured questionnaire was used. The questionnaire contained questions on basic socio demographic profile, antibiotics knowledge, perception related questions. Official permission to conduct the study was obtained from the Institutional ethics committee. After obtaining the informed consent of the participants, the semi-structured questionnaire was administered to them. The data collected were entered in MS Excel and was analyzed using SPSS Version 16. Appropriate descriptive and inferential statistics was used to analyze the data.

RESULTS:

A total of 134 participants were interviewed and majority of them (61.9%) were males. The age group ranged from 26 to 80 years (Mean 44.85Yrs, SD 12.94Yrs). Most of them (88.1%) studied their undergraduate medical degree from government colleges. Among the participants 44% have only undergraduate degree while others have completed any post-graduation.

TABLE.1 SOCIO DEMOGRAPHIC PROFILE OF THE STUDY PARTICIPANTS

Variable	Categories	Frequency (N-134)	Percentage
Age in years	More than 35	97	72.4
	Less than 35	37	27.6
Sex	Male	83	61.9
	Female	51	38.1
Place of study of UG	Government	118	88.1
	Private	16	11.9
Educational qualification	PG	75	56.0
	UG	59	44.0
Speciality	MBBS	59	44.0
	OBG	17	12.7
	Pediatrics	16	11.9
	General medicine	11	8.2
	General Surgery	9	6.7
	ENT	8	6.0
	Orthopedics	6	4.5
	Diabetology	5	3.7
	Ophthalmology	3	2.2

KNOWLEDGE:

All of the 134 participants answered correctly not to give antibiotics in case of afebrile diarrhea with no dehydration.89.6% of them answered correctly not to start antibiotic in uncomplicated upper respiratory infection (URI). Only 11.2% had knowledge about no need in reduction of doses of the \specified drugs in renal failure. Only 15.7% knew the drug which crosses the Blood Brain Barrier (BBB) and 22.4% knew about the Anti-tubercular treatment

TABLE.2 KNOWLEDGE OF RATIONAL USE OF ANTIBIOTICS

Knowledge about Antibiotics (N = 134)	Frequency	Percentage
Antibiotics is used against bacteria	129	96.3
Acute Diarrhoeal Disorder (ADD)	134	100
Uncomplicated URI	120	89.6
Dose Reduction In Renal Failure	15	11.2
Drug safe in Pregnancy	132	98.5
Crosses BBB	21	15.7
Drug against Anaerobes	132	98.5
Rational Fixed Dose Combination	91	67.9
Drug of choice For Uncomplicated Typhoid	130	97.0
Methicillin Resistant Staph. Aureus Susceptibility	119	88.8
ATT Default management	30	22.4

KNOWLEDGE SCORING: Knowledge part consisted of 11 questions.For each question, the right answer was given a score of 1 and the wrong answers was given a score of 0. n a score of 11, the mean score was 7.08 with a SD 1.32. The maximum score of 10 was scored by 5 participants. The scores obtained by the participants is given in the table below: (ATT) default management

TABLE.3 KNOWLEDGE SCORING

SCORE	FREQUENCY N=134	PERCENTAGE
Poor Knowledge - 7 OR BELOW	94	70.1
Good Knowledge - MORE THAN 7	40	29.9

PERCEPTION ABOUT RATIONAL USE OF ANTIBIOTIC

All the participants perceive that antibiotic resistance is a major public health problem. Among the source of information and updates on antibiotics, CME Programmes were the most common (100%),the others being internet browsing (70.1%), medical representatives (64.2%), medical journals (51.5%) and discussing with the peer groups being the least (10.4%).About three-fourth were of the opinion that antibiotics are prescribed unnecessarily for Upper Respiratory Infections followed by Diarrhoea(49.3%), Pyrexia of unknown origin (21.6%)and uncomplicated urinary tract infections(7.5%). Taking incomplete course of antibiotics by the patients and Over the counter availability of antibiotics were perceived to be the reason for emergence of antibiotic resistance by most of the participants. Pressure from the patients and fear of losing them were the most common reason felt by the participants for prescribing antibiotics even when it is not needed. 97% of them were aware of National List of Essential Medicines while of whom only 3% have them. CME Programmes and legal policies against unnecessary use of antibiotics were recommended by most of them to improve awareness on antibiotics followed by microbiology diagnostic services and local antibiotic policy. Most of them (74.6%) were of the opinion that branded drugs are not superior to generic drugs.

TABLE.4 PERCEPTION ABOUT RATIONAL USE OF ANTIBIOTICS

Perception about antibiotic usage		Frequency N=134	Percentage	Max Score	Minimum Score
Reason for emergence of antibiotic resistance	Incomplete course	130	97.0	6	0
	OTC	126	94		
	Overuse	120	89.6		
	Inappropriate dosage	98	73.1		
	Poor quality drugs	8	6.0		
	Irrational use in animals	9	6.7		
Reasons for unnecessary prescription	Patient Pressure	78	58.2	5	0
	Fear of losing patient	54	40.3		
	Lack of knowledge of diagnosis	2	1.5		
	Lack of time	2	1.5		
	Incentives from drug companies	0	0		
NLEM	Aware NOT having	126	94	2	0
	Aware and having	4	3		
	Not aware	4	3		

TABLE.5 PERCEPTION SCORE

SCORE	FREQUENCY N=134	PERCENTAGE
ACCEPTABLE LEVEL OF PERCEPTION-8 AND ABOVE	103	76.9
NOT ACCEPTABLE LEVEL OF PERCEPTION- 7 OR BELOW	31	23.1

RELATIONSHIP BETWEEN KNOWLEDGE AND SOCIO DEMOGRAPHIC FACTORS

Socio demographic factors such as age, sex, college from which graduated and the post-graduation does not have significant association with knowledge about antibiotics

TABLE.6 RELATIONSHIP BETWEEN KNOWLEDGE AND SOCIO DEMOGRAPHIC PROFILE

FACTORS	KNOWLEDGE		TOTAL N=134	TEST	p-VALUE
	POOR	GOOD			
GOVT COLLEGE	83 70.3%	35 29.7%	118	$X2_{(0.05)}=0.017$ df=1	0.896
PRIVATE COLLEGE	11 68.8%	5 31.2 %	16		
FEMALE	35 68.6%	16 31.4%	51	$X2_{(0.05)}=0.091$ df=1	0.763
MALE	59 71.1%	24 28.9%	83		
UG	45 76.3%	14 23.7%	59	$X2_{(0.05)}=1.887$ df= 1	0.170
PG	49 65.3%	26 34.7%	75		
AGE <35	27 73.0%	10 27.0%	37	$X2_{(0.05)}=0.195$ df=1	0.659
AGE >35	67 69.1%	30 30.9%	97		

RELATIONSHIP BETWEEN PERCEPTION AND SOCIO DEMO-GRAPHIC FACTORS

There is no statistically significant association between the socio demographic factors such as age, sex, college graduated, speciality and the perception of rational use of antibiotics

ASSOCIATION BETWEEN KNOWLEDGE AND PERCEPTION OF RATIONAL USE OF ANTIBIOTICS :

There is no significant association between knowledge and perception of rational use of antibiotics.

TABLE.7 RELATIONSHIP BETWEEN PERCEPTION AND SOCIO DEMOGRAPHIC FACTORS

FACTORS	PERCEPTION		TOTAL	TEST	p-VALUE
	NOT ACCEPTABLE	ACCEPTABLE			
GOVT COLLEGE	26 22.0%	92 78.0%	118	$X2_{(0.05)}=0.673$ df=1	0.412
PRIVATE COLLEGE	5 31.2%	11 68.8 %	16		
FEMALE	11 21.6%	40 78.4%	51	$X2_{(0.05)}=0.114$ df=1	0.736
MALE	20 24.1%	63 75.9%	83		
UG	14 23.7%	45 76.3%	59	$X2_{(0.05)}=0.021$ df= 1	0.885
PG	17 22.7%	58 77.3%	75		
AGE <35	7 18.9%	30 81.1%	37	$X2_{(0.05)}=0.511$ df=1	0.475
AGE >35	24 24.7%	73 75.3%	97		

TABLE.8 ASSOCIATION BETWEEN KNOWLEDGE AND PERCEPTION:

	PERCEPTION			TEST	p-value
Knowledge	Not acceptable	Acceptable	Total		
Poor	14 29.2%	34 70.8%	48	$X2_{(0.05)}=1.530$ df= 1	0.216
Good	17 19.8%	69 80.2%	86		

DISCUSSION:

The overall mean score on the knowledge questions (7.08/11) was lower than the result from a study conducted in Peru (6/7) done by Garcia C et al7, but almost the same as the mean score (4/8) in a study conducted in DR Congo3. The difference was large due to three questions which were answered worst: dose reduction in renal failure, drug crossing BBB, management of a case of default in TB.

According to WHO, URI and diarrhoea are the most common conditions where antibiotics are prescribed unnecessarily. But in this study all of the participants have knowledge not to prescribe antibiotics for a case of diarrhoea, a better knowledge when compared to the study conducted in DR Congo (89.7%) and Peru (93%). In this study the knowledge of not prescribing antibiotics for uncomplicated URI is 89.6%, while in the study conducted in DR Congo it is very low (27.9%) and in Peru it is 76%. However this needs future intervention to impart knowledge to avoid antibiotics in uncomplicated URI. There is no significant association between socio demographic factors (age, sex, college in which graduated, post-graduation) and knowledge about antibiotics. This is similar to the study conducted in DR Congo. The availability of unbiased information about antibiotics is a prerequisite for appropriate antibiotic prescribing3 .The source of information on antibiotic updates perceived by the participants were CME Programmes (100%), internet browsing (70.1) and through medical representatives (64.2%), while the study conducted in DR Congo showed it was pharmaceutical companies (73.9%), antibiotic guidelines (66.3%), university courses (63.6%). Although lo west appreciated for usefulness, it confirms the prominent role of pharmaceutical industry as the main source of information in resourcelimited settings and this is of concern as drug promotions in these settings may not always be content-directed or evidence-based. In contrast, antibiotic guidelines and in particular WHO guidelines were used less frequently3. Internet sources were ranked as the second most useful source. In this scenario, distant learning technologies which have been used successfully in other disciplines may have a place in promoting educational antibiotic prescribing programs. In this study pressure from the patient to prescribe antibiotic was perceived to be the cause for antibiotic misuse by 58.2% almost similar to the study conducted in DR Congo (61.9%), but it was higher in the study conducted in Peru (70%). The incentives from the pharmaceutical company had no influence on antibiotic prescription in this study in contrast to 13.3% in the study conducted by Ambili Remesh et al8. Regarding the knowledge about NLEM, 97% were aware of it which is slightly higher (91%) when compared to the study conducted by Ambili Remeshet al8.

LIMITATIONS:

KAP-surveys have inherent limitations: for instance, respondents may be triggered to the topic and this - in combination with the multiple choice format of the questionnaire may direct them to give socially desirable answers. Further, expecting a professional in a remote and busy health centre to fill in a questionnaire is cumbersome. Finally, the present survey only addressed medical doctors in private clinics and does not include doctors in hospital settings and others prescribing antibiotics (nurses, paramedics, AYUSH doctors).However the strength of the study is that the questionnaire was distributed and filled-in on-site, precluding consultancy of peers or resources.

RECOMMENDATIONS:

1. By improving the knowledge about rational use of antibiotics among doctors by conducting CME at regular intervals, through distant learning technologies, the resistance to antibiotics can be minimised.
2. Legal policies can be implemented to restrict over the

counter availability of drugs.
3.Standard treatment guidelines can be taught at the undergraduates so as to follow at primary care levels.
4. Audit of prescriptions at community level at regular intervals in both government and private institutions can be done to monitor overuse and misuse of antibiotics.
5. Strengthening of legal policies to maintain a copy of prescription at the treating institution level so that it can be audited.

CONCLUSION:

The present study shed a light on the antibiotic prescribing behavior by medical doctors in private clinic settings in Vellore district of Tamil Nadu. In order to understand the whole extent of inappropriate antibiotic prescribing and usage, further research is needed among the other channels of antibiotic prescribing and procurement, as well as from private dispensers and the general public.

REFERENCES

1.World Health Organization. The evolving threat of antimicrobial resistance: Options for action. WHO Publ [Internet]. 2014;1–119. Available from: http://www.ijmr.org.in/article.asp?issn=0971 5916;year=2014;volume=139;issue=1;spage=182;epage=183;aulas t=Kapi
2.Björkman I, Erntell M, Röing M, Lundborg CS. Infectious disease management in primary care: perceptions of GPs. BMC Fam Pract [Internet]. BioMed Central Ltd; 2011;12(1):1. Available from: http:// www.biomedcentral.com/1471-2296/12/1
3.Thriemer K, Katuala Y, Batoko B, Alworonga J-P, Devlieger H, Van Geet C, et al. Antibiotic prescribing in DR Congo: a knowledge, attitude and practice survey among medical doctors and students. PLoS One [Internet]. 2013;8(2):e55495. Available from: http:// dx.plos.org/10.1371/journal.pone.0055495
4.Strandberg EL, Brorsson A, Hagstam C, Troein M, Hedin K. “ I ’ m Dr Jekyll and Mr Hyde ”: Are GPs ’ antibiotic prescribing patterns contextually dependent? A qualitative focus group study. Scand J Prim Health Care. 2013;31(May):158–65.
5.Kotwani A, Wattal C, Katewa S, Joshic PC, Holloway K. Factors influencing primary care physicians to prescribe antibiotics in Delhi India. Fam Pract. 2010;27(6):684–90.
6.Problems of Irrational Drug Use-Session Guide [http:// d c c 2 . b u m c . b u . e d u / p r d u / S e s s i o n _ G u i d e s / problems_of_irrational_drug_use.htm]. (19.02.2016)
7.Garcia C, Llamocca LP, Garcia K, Jimenez a, Samalvides F, Gotuzzo E, et al. Knowledge, attitudes and practice survey about antimicrobial resistance and prescribing among physicians in a hospital setting in Lima, Peru. BMC Clin Pharmacol [Internet]. BioMed Central Ltd; 2011;11(1):18.
Available from: http://www.ncbi.nlm.nih.gov/pubmed/22085536
8.Remesh A, Gayathri AM, Singh R, Retnavally KG. The knowledge, attitude and the perception of prescribers on the rational use of antibiotics and the need for an antibiotic policy-a cross sectional survey in a Tertiary Care hospital. J Clin Diagnostic Res. 2013;7(4):675–9.