

ASSESSMENT OF PUBLIC KNOWLEDGE AND ATTITUDE REGARDING ANTIBIOTIC USE IN A TERTIARY CARE HOSPITAL**CHANDRAKANTH P¹, MOHAMED SALEEM TS^{1*}, MADHAN MOHAN REDDY¹, GOPINATH C¹,
MADHAN MOHAN RAO²**¹Department of Pharmacology and Pharmacy Practice, Annamacharya College of Pharmacy, Rajampet - 516 126, Andhra Pradesh, India.²Department of General Medicine, Rajiv Gandhi Institute of Medical Sciences, Kadapa, Andhra Pradesh, India. Email: saleemcology@gmail.com*Received: 28 July 2015, Revised and Accepted: 25 September 2015***ABSTRACT**

Objective: The present study was designed to investigate the public knowledge and attitude toward antibiotic use in a general population visiting the tertiary care hospital.

Methods: A prospective cross-sectional survey conducted for a period of 6-month December-2013 to May-2014. Knowledge scoring was given based on the percentage of correct responses. Data were collected using a self-prepared questionnaire and analyzed using descriptive statistics. Association of respondent's knowledge score with sex, age group, educational level, and income was analyzed by Chi-square test.

Results: The results of our study showed that the level of knowledge on antibiotics use was poor in 117 (65%) of the study population who had given <50% correct response. The current study showed that there was a significant difference in knowledge between education level groups ($p \leq 0.0001$). The other responses regarding knowledge are 27.2% accepted that antibiotics are indicated for relieving pain and inflammation, 45% of participants thought that antibiotics are the drugs indicated to reduce fever. About 76.6% of respondents had administered antibiotics without a doctor's prescription, 44% of respondents used antibiotics with their friends and family member's suggestions. 48% of respondents keep antibiotics stock at home for future use and 79.4% of respondents keep leftover antibiotics for personal future use, 31% share their antibiotics with family members when they are sick and 34% of respondents use leftover antibiotics for a respiratory illness.

Conclusion: Patients, as well as healthcare professionals, have a major role to play in attaining rational antibiotic use. Antibiotic awareness campaigns and patient counseling should promote specific messages to public members from the "high risk" groups, to fill up the knowledge and attitude gaps.

Keywords: Antibiotic use, Self-medication, Attitude, Miss-use, Awareness, Microbial resistance.

INTRODUCTION

Resistance to antimicrobial drugs by the microorganism is increased now as days due to improper use of antibiotics. Microbial resistance is the one of the major issues of the world human health. Self-medication is one of the emerging factors to cause this condition. It is important to create the awareness regarding knowledge and attitude in relation to antibiotic use in the general public is more advisable. Pharmacist wants to play a major role to avoid self-medication of antibiotics to prevent the microbial resistance [1-4].

Inappropriate use of antibiotics may create several problems like increasing the cost of healthcare system and side effect; this is a direct relation to patient knowledge and attitude in the use of antibiotics [3,5,6]. In most of the study, it is found that many factors such as non-compliance, sharing of drugs, and more use of leftover antibiotics contributed to develop microbial resistance to the patients receiving antibiotics which leads to therapeutic failure [7-10]. It is important to strengthen the educational activities and health care community and also to initiate the physician to create awareness in the patients related to antibiotic use [2]. The present study was designed to investigate the public knowledge and attitude toward antibiotic use in a general population visiting the tertiary care hospital.

METHODS**Study design and population**

The present study was conducted in Rajiv Gandhi Institute of Medical Sciences (RIMS), Kadapa from December 2013 to May 2014. The study was initiated after getting approval from the Institutional Ethical Committee, RIMS, Kadapa. The method of study is a cross-sectional

survey using a validated self-administered questionnaire and the population included in this study is patients and their caretakers such as patient's family members, friends, and relatives attending the outpatient department of the RIMS hospital, Kadapa. According to an average number of patients visited in the hospital outpatient department, the maximum sample size obtained for the survey is 180. The inclusion criteria of the study were (1) >18 years, (2) Understood English and Telugu language and (3) were aware of the term antibiotics. The study participants those who are satisfying the inclusion criteria were included in the study.

All necessary and relevant information was collected by interviewing the patients with self-prepared, structured questionnaires (designed in two languages: English and Telugu) which are adapted from previous studies [11-14] and modified according to our study area. The questionnaires comprised of the following category. Category 1 was patient demographic characteristics. Category 2 was a pattern of antibiotic used by patients. Category 3 contains the questions to assess the patient knowledge regarding antibiotic use. Category 4 contains the questions to assess the attitude of patients towards antibiotic use. The study population were requested to choose three options provided "Yes" or "No" and "Donot Know" in category 2 and 3 questionnaires. In Category 4, the respondents were requested to selected "agree" or "Disagree."

In the section assessing, the antibiotic knowledge of the study populations (Category 3), the scoring was assessed by calculating the number of correct responses to ten questions and the scoring was given as follows: Poor - (<50% correct responses), adequate - (50-70% correct response) and good knowledge - (>70% correct response).

Statistical analysis

All the data of the study populations was entered into Microsoft excel spreadsheet and descriptive statistics were used for demographic characteristics. Association of respondent's knowledge score with sex, age group, educational level and income was analyzed by Chi-square test using Graph pad prism. $p \leq 0.05$ were considered significant.

RESULTS

The total sample size of the present study was 180 members, of which 114 were males and 66 were females. The knowledge of study populations regarding antibiotic use was documented in Table 1. Out of 180 patients, percentage gender distribution of the study population showed that 63.33% males and females 36.67%. There was no statistical difference regarding antibiotic use in the knowledge between both genders. Poor knowledge was observed in 61% of male and 71.21% of female out of the total respondents as shown in Fig. 1.

Out of total patients, 64 (35.55%) were between the age group 26-35 years, followed by 53 (29.44%) in between the age group 36-45 years, 34 (18.89%) in between the age group >45 years then finally 29 (16.11%) in between the age group 18-25 years. There was no statistical difference regarding antibiotic use in the knowledge between age groups. The results were presented in Fig. 2.

Total distribution of respondents with respect to education level shows that majority of patients were found by completing secondary schooling with 66 (36.7%), followed by no education with 50 (27.8%), primary schooling in 45 (25%), and finally completing graduate with 19 (10.5%). There was significant difference in knowledge between education level groups ($p < 0.0001$). The percentage of respondents with good knowledge was low in primary and secondary education level and high in graduates with 36.8% as represented in Fig. 3.

Out of 180 respondents, 121 (67.2%) were living in rural area followed by 59 (32.78%) living in urban area. There was significant ($p < 0.002$) difference in the knowledge between the two groups according to the place of living (Fig. 4).

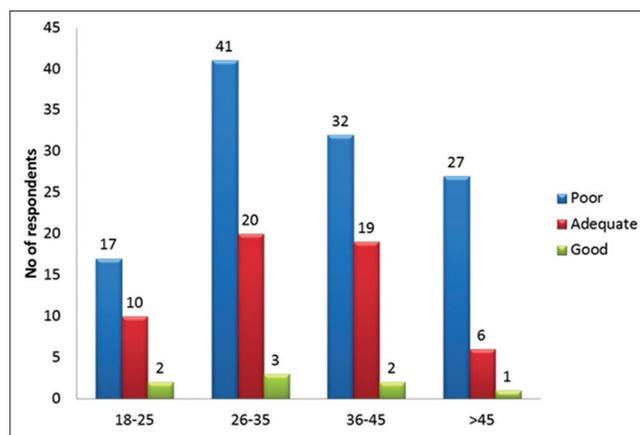


Fig. 2: Knowledge based on age group distribution

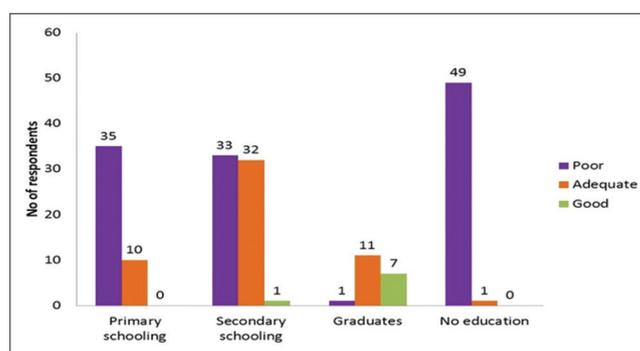


Fig. 3: Knowledge based on education level

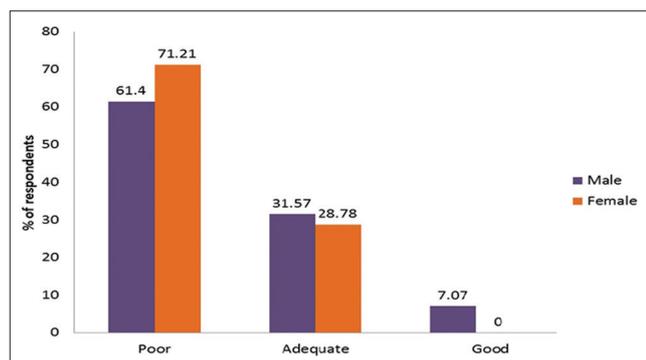


Fig. 1: Knowledge based on gender distribution

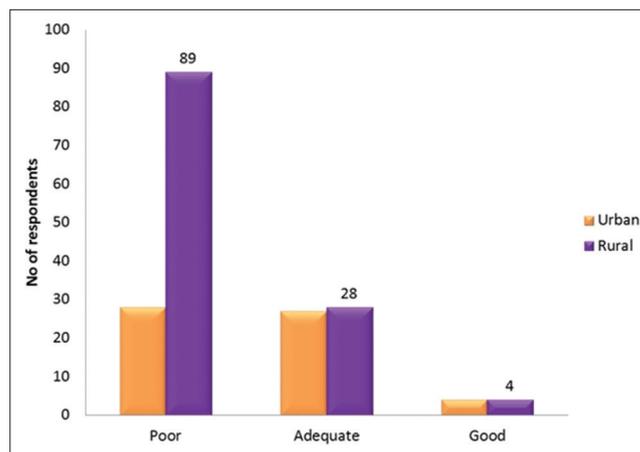


Fig. 4: Knowledge based on place of living

Table 1: Knowledge of respondents regarding antibiotic use

Statements evaluating knowledge regarding antibiotic use	Yes (%)	No (%)	Don't know (%)
Antibiotics are medicines that can kill bacteria	110 (61.11)	22 (12.22)	48 (23.33)
Antibiotics can be used to treat viral infections	27 (15)	96 (53.33)	57 (31.67)
Antibiotics can cure all infections	36 (20)	72 (40)	72 (40)
Antibiotics are indicated to relieve pain/inflammation	49 (27.22)	56 (31.11)	57 (31.66)
Antibiotics are used to reduce fever	82 (45.55)	60 (33.33)	38 (21.11)
Overuse of antibiotics can cause antibiotic resistance	61 (33.8)	56 (31.11)	63 (35)
Antibiotics may cause allergic reaction	71 (39.44)	44 (23.88)	66 (36.66)
All antibiotics do not cause side effects	66 (36.66)	45 (25)	69 (38.33)
If your symptoms are improved then will you stop taking a full course of antibiotics	118 (65.55)	46 (25.56)	16 (8.89)
The effectiveness of treatment is reduced if a full course of antibiotic is not completed	67 (37.22)	67 (37.22)	46 (25.56)

Total distribution of respondents with respect to the use of antibiotics in the last year shows that majority were found 81 (45%) taken antibiotics for 1-2 times followed by 60 (33.33%) taken antibiotics for >3 times and finally 39 (21.67%) not used antibiotics (Fig. 5).

Out of 180 study participants, self-medication with antibiotics was one of the major issues to be evaluated in our study. Almost 138 (76%) of respondents administered antibiotics without doctor's prescription. In this study, 81 (45%) of respondents undergone treatment with antibiotics more than 3 times in last year. 99 (55%) of participants modified their prescription by themselves/pharmacist. The total 80 (44.44%) respondents used antibiotics with their friends and family member's suggestions. The results were presented in Table 2.

Regarding the attitude of patients on antibiotic use, 67% of the respondents preferred to take antibiotics for common cold and 56 (31.11%) of respondents shared their antibiotics with family members. Out of total respondents, more than 45% keep the leftover antibiotics stock at home for an emergency. A good approach that 169 (93.89%) agreed that they would follow dosage instructions as prescribed by the physician. More than 76.8% patients look at expiry date of antibiotics before administering the drug. In the total respondents, 45% would use antibiotics as prophylaxis. The results were presented in Table 3.

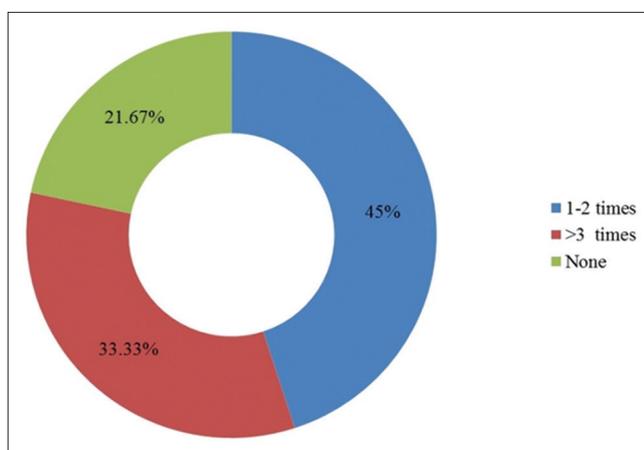


Fig. 5: Antibiotic used by study population in last year

Table 2: Patterns of antibiotics use among patients

Statements regarding antibiotics use	Total (n=180) (%)
Have you administered antibiotics without a doctor's prescription	
Yes	138 (76.66)
No	42 (23.33)
How many times did you undergo treatment during the last year	
None	39 (21.67)
1-2 times	81 (45)
≥3 times	60 (33.33)
How often has your prescription been modified by yourself/pharmacist	
Rarely	99 (55)
Never	81 (45)
Do you use complete course of antibiotics	
Yes	125 (69.44)
No	55 (30.56)
Do you use antibiotics with any of your friends and family member's suggestions	
Yes	80 (44.44)
No	100 (55.56)

DISCUSSION

Knowledge and attitude of patients on antibiotic drug related problems can mostly influence the way the antibiotics are used [6]. In most of the study, a lack of knowledge about antibiotics was detected. Gualano et al. [2] reported that 33.7% population do not aware about the use of antibiotic to treat bacterial infection, and 53.9% population believe that antibiotic cure viral infections. Moreover also in their study, they found that 26.9% population does not know the improper use of antibiotic cause microbial resistance.

In one study, it is reported that 32.7% population used antibiotics as self-medication, and also they retrieved the information from the previous experience with physician prescription in this study another important think is notified that only 9.8% population knew the definition of microbial resistance [3].

The results of our study showed that the level of knowledge on antibiotics use was poor in 117 (65%) of the study population who had given <50% correct response. It is higher than the study reported by Oh et al. (2011) that they found only 28.9% poor knowledge respondents. In this study, 57.89% of graduates and 48% of those completed secondary schooling are with adequate knowledge regarding antibiotic use. The current study showed that there was significant difference in knowledge between education level groups (p<0.0001). The result showed that there was significant (p<0.002) difference in the knowledge between the rural and urban participants which may be due to lack of awareness and education level.

In terms of knowledge, it was discouraging to note that 48.9% of the participants were unaware of the indications for use of their medications that antibiotics are used to treat bacterial infections. The patients thought their antibiotics prescribed for other indications. Among the total participants, 27.2% accepted that antibiotics are

Table 3: Attitude towards antibiotic use among respondents

Statements evaluating attitude	Number	Percentage
When I get a cold, I will take antibiotics to help me get better more quickly		
Agree	121	67.22
Disagree	59	32.7
I expect antibiotics to be prescribed by my doctor if I suffer from common cold symptoms		
Agree	129	71.67
Disagree	51	28.3
If my family member is sick, my antibiotics can be given to them		
Agree	56	31.11
Disagree	124	68.89
I normally keep antibiotic stocks at home in case of emergency		
Agree	87	48.33
Disagree	93	51.67
I will use leftover antibiotics for a respiratory illness		
Agree	67	37.22
Disagree	113	62.28
I will follow dosage instructions as prescribed by doctor		
Agree	169	93.89
Disagree	11	6.11
I normally will look at the expiry date of antibiotics before taking it		
Agree	133	73.8
Disagree	47	26.2
I will use antibiotics as a prophylaxis		
Agree	81	45
Disagree	99	55

indicated for relieving pain and inflammation which causes confusion in individuals. The patient's with the symptom of pain have the chance of administering the antibiotics leading to misuse of antibiotics.

The percentage of populations who thought that the prescription of antibiotics can cure viral infections is 46.7% was lower than the percentage (54-70%) reported by other studies from various countries [15-18].

In the current study, 45% of total participants thought that antibiotics are the drugs indicated to reduce fever, this misconception may be the reason for over-use of antibiotics. Another finding in this study regarding antibiotic resistance was 66.11% of respondents were unaware that overuse of antibiotics can cause antibiotic resistance. These results suggest that misunderstandings about antibiotic use were prevalent, which may cause unnecessary risk of antibiotic-resistant infection. The most common reason for the lack of knowledge was seen in the majority of the study population was that they are not at all concerned about their health and regarding the use of prescribed medications.

In our study, 76.6% of respondents had administered antibiotics without a doctor's prescription which includes 47% of graduate's have taken antibiotics as self-medication. Among the total participants, 55% of respondents modified their prescription by themselves or by Pharmacists that leads to misuse of antibiotics. In our study, 44% of respondents used antibiotics with their friends and family member's suggestions.

In the current study, 65.55% of the respondents believed antibiotics could be stopped once they feel better from the symptoms of their infections appear to have stopped. This is a misconception in the use of antibiotics and those involved are at the risk of infection relapse, colonization with antibiotic resistant organisms and complicated disease outcomes [19,20]. Sub-inhibitory concentrations of antibiotic in the body which results from incomplete dosage regimen may lead to the development of resistance by the pathogen causing the infection being treated [21].

Irrespective of education level and age group, the attitude regarding antibiotic use, varies among participants that 67% of the respondents would take antibiotics for a common cold which causes the inappropriate use of antibiotics. In our study, 48% of respondents keep antibiotics stock at home for future use and 79.4% of respondents keep leftover antibiotics for personal future use, this practice of patients should be discouraged to reduce overuse or misuse of antibiotics. More than 31% share their antibiotics with family members when they are sick, and 34% of respondents use leftover antibiotics for respiratory illness. This should be discouraged to reduce or delay the emergence and spread of antibiotic resistance. One significant finding regarding the attitude was that 76.8% would check the expiry date of antibiotics before administering.

Assessment of patient's use of antibiotics may provide valuable information which could help toward developing interventions targeting to improve the use of antibiotics [6]. The reasons for misuse of antibiotics includes taking of antibiotics without a doctor's prescription, using antibiotics with their friends and family member's suggestions, taking antibiotics for a common cold, keeping antibiotics stock at home, sharing their antibiotics with family members when they are sick, using leftover antibiotics for respiratory illness and misconception that antibiotics are indicated for relieving pain and inflammation, antibiotics are the drugs indicated to reduce fever due to the were unaware of the indications for use of their medications.

Limitation of this study

The main intention of our study was to assess the patient's knowledge regarding antibiotic use without providing counseling and education to the patients. This study is limited to the region Kadapa, Andhra Pradesh, India with total sample size of 180 people.

CONCLUSION

The present study is useful in describing patient's knowledge and attitude regarding antibiotic use among patients visiting RIMS hospitals. The findings may be useful to develop an intervention to decrease misconceptions regarding antibiotic use and to increase people's awareness regarding the risks of inappropriate use of antibiotics in the community. The results of this study suggest the necessity of educational campaigns aimed at patients, in order to take adequate information and promote the rational use of drugs. Studies that assess the knowledge and attitude of patient's should be encouraged, since the change of behavior and attitudes of the population regarding the use of antibiotics is an important first step in combating the misuse of antibiotics and antimicrobial resistance. Patients, as well as healthcare professionals, have a major role to play in attaining rational antibiotic use. Antibiotic awareness campaigns and patient counseling should promote specific messages to public members from the "high risk" groups, to fill up the knowledge and attitude gaps as an effort against antibiotic resistance.

ACKNOWLEDGMENT

The author's thanks to management and principal, Annamacharya College of Pharmacy, Rajampet for the facility provided to carry out the research work. The author's thanks to Director, RIMS, Kadapa for accepting our research to conduct in the hospital premises.

REFERENCES

1. Roque F, Soares S, Breitenfeld L, Figueiras A, Herdeiro MT. Influence of community pharmacists? Attitudes on antibiotic dispensing behavior: A cross-sectional study in Portugal. *Clin Ther* 2015;37(1):168-77.
2. Gualano MR, Gili R, Scaioli G, Bert F, Siliquini R. General population's knowledge and attitudes about antibiotics: A systematic review and meta-analysis. *Pharmacoepidemiol Drug Saf* 2015;24(1):2-10.
3. Napolitano F, Izzo MT, Di Giuseppe G, Angelillo IF. Public knowledge, attitudes, and experience regarding the use of antibiotics in Italy. *PLoS One* 2013;8(12):e84177.
4. Costelloe C, Metcalfe C, Lovering A, Mant D, Hay AD. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: Systematic review and meta-analysis. *BMJ* 2010;340:c2096.
5. Maragakis LL, Perencevich EN, Cosgrove SE. Clinical and economic burden of antimicrobial resistance. *Expert Rev Anti Infect Ther* 2008;6(5):751-63.
6. Jose J, Jimmy B, Alsabahi AG, Al Sabei GA. A study assessing public knowledge, belief and behavior of antibiotic use in an Omani population. *Oman Med J* 2013;28(5):324-30.
7. Kandakai TL, Price JH, Telljohann SK, Holiday-Goodman M. Knowledge, beliefs, and use of prescribed antibiotic medications among low-socioeconomic African Americans. *J Natl Med Assoc* 1996;88(5):289-94.
8. Kardas P. Noncompliance in current antibiotic practice. *Infect Dis Clin Pract* 2006;14(4):11-4.
9. Pechère JC, Hughes D, Kardas P, Cornaglia G. Non-compliance with antibiotic therapy for acute community infections: A global survey. *Int J Antimicrob Agents* 2007;29(3):245-53.
10. Shehadeh M, Suaifan G, Darwish RM, Wazaify M, Zaru L, Alja'fari S. Knowledge, attitudes and behavior regarding antibiotics use and misuse among adults in the community of Jordan. A pilot study. *Saudi Pharm J* 2012;20(2):125-33.
11. Parimi N, Pinto Pereira LM, Prabhakar P. The general public's perceptions and use of antimicrobials in Trinidad and Tobago. *Rev Panam Salud Publica* 2002;12(1):11-8.
12. Vanden Eng J, Marcus R, Hadler JL, Imhoff B, Vugia DJ, Cieslak PR, et al. Consumer attitudes and use of antibiotics. *Emerg Infect Dis* 2003;9(9):1128-35.
13. You JH, Yau B, Choi KC, Chau CT, Huang QR, Lee SS. Public knowledge, attitudes and behavior on antibiotic use: A telephone survey in Hong Kong. *Infection* 2008;36(2):153-7.
14. Ling Oh A, Hassali MA, Al-Haddad MS, Syed Sulaiman SA, Shafie AA, Awaisu A. Public knowledge and attitudes towards antibiotic usage: A cross-sectional study among the general public in the state of Penang, Malaysia. *J Infect Dev Ctries* 2011;5(5):338-47.
15. Belongia EA, Naimi TS, Gale CM, Besser RE. Antibiotic use and upper

- respiratory infections: A survey of knowledge, attitudes, and experience in Wisconsin and Minnesota. *Prev Med* 2002;34(3):346-52.
16. Grigoryan L, Burgerhof JG, Degener JE, Deschepper R, Lundborg CS, Monnet DL, *et al.* Attitudes, beliefs and knowledge concerning antibiotic use and self-medication: A comparative European study. *Pharmacoepidemiol Drug Saf* 2007;16(11):1234-43.
 17. McNulty CA, Boyle P, Nichols T, Clappison P, Davey P. Don't wear me out – The public's knowledge of and attitudes to antibiotic use. *J Antimicrob Chemother* 2007;59(4):727-38.
 18. Filipetto FA, Modi DS, Weiss LB, Ciervo CA. Patient knowledge and perception of upper respiratory infections, antibiotic indications and resistance. *Patient Prefer Adherence* 2008;2:35-9.
 19. Liu YC, Huang WK, Huang TS, Kunitz CM. Inappropriate use of antibiotics and the risk for delayed admission and masked diagnosis of infectious diseases: A lesson from Taiwan. *Arch Intern Med* 2001;161(19):2366-70.
 20. Carey B, Cryan B. Antibiotic misuse in the community – A contributor to resistance? *Ir Med J* 2003;96(2):43-4, 46.
 21. Sarkar P, Gould IM. Antimicrobial agents are societal drugs: How should this influence prescribing? *Drugs* 2006;66(7):893-901.