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Antibiotic and Antimalarial Selfmedication in Antananarivo, Madagascar

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Abstract: In order to assess prevalence and characteristics of antimicrobial self-medication in Antananarivo, Madagascar. We conducted a cross-sectional study among 101 patients in Department of Infectious Disease in the Academic Hospital Center of Antananarivo. Eighty-eight percent of patients had practiced self-medication whose 40% were employees of the primary sector. Antibiotic and antimalarial are used in 48% and 22%, respectively. Chloroquine is the most commonly used antimalarial while chloroquinoresistance is widespread in Madagascar. Amoxicillin was the most widely used antibiotic. The practice of selfmedication is related especially to the development of the illicit sale of drugs in Madagascar.

Keywords: Self-Medication, Illicit Sale, Antimalarials, Antibiotics, Antananarivo, Madagascar

1. Introduction

Self-medication can be defined as the use of drugs to treat self-diagnosed disorders or symptoms without consulting a medical practitioner and without any medical supervision, or the intermittent or continued used of a prescribed drug for chronic or recurrent disease or symptoms [1].

Internationally, self-medication has been reported as being on the rise [2]. In the past several years, self-medication has been studied in many areas and several authors have reported the prevalence among healthcare services attendants [3, 4]. In developing countries like Madagascar, up to 60-80% of health problems are self-medicated. Antibiotics and antimalarials are commonly used in self-treatment, often resulting in inappropriate use [5, 6]. Hence, this cross-sectional study was undertaken to assess the prevalence of antibiotic and antimalarial self-medication and to investigate the determinants and reasons that influence the practice of self-treatment in the general population in Antananarivo which is the capital of Madagascar.

2. Methodology

A descriptive, cross-sectional study was conducted from December 2010 to January 2011. The study population consisted of patients in the Department of Infectious Diseases, University Hospital Joseph Raseta, Befelatanana Antananarivo. All patients who agree to answer pre-established questionnaires and did not have mental disorders or disturbances of consciousness were included in this study. Total 101 patients were included. All the patients were explained about the type and purpose of the study and informed that participation is voluntary and their collected information will not be shared and it would be anonymous. The following characteristics of the respondent were collected and analyzed: age, gender, marital status, education level, occupation, pharmacy's proximity and types of drugs used for self-medication.

Statistical analyses

Data was analysed by "R" software created by Robert Gentleman and Ross Ihaka, in the Department of Statistics at

the University of Auckland in New Zealand.

3. Results

During the study period, 101 respondents were analyzed. Out of 101 respondents, fifty-two (51.4%) were males and 49 (48.5%) were females. The mean age of respondents was 39 years (range: from 18 to 36 years). Self-medication practice was reported by 89 (88.1%) patients. Of these respondents, forty-eight percent stated that they had used antibiotics; twenty-two percent had used antimalarials. Fifty percent of the study population had self-prescribed antibiotics and antimalarials prior to the hospitalisation. Employees in the primary sector (40%) practiced self-medication more compared to other sectors. The pharmacy's proximity had no influence on the practice of self-medication. The principal characteristics of the patients who filled the survey and their relationship on having some form of self-medication are detailed in Table 1. The tables 2 and 3 show the clinical signs for which antimalarial and antibiotics were self-prescribed and drug classes used for self-medication, as reported by the respondents, respectively.

Sixty one percent of respondents buy drugs in grocery stores, drug peddler or retailers; the pharmacy was only frequented in 38.5% of cases. Reasons given for self-medication behavior were that respondents had previous experience with similar ailments, long waiting times in hospitals and clinics and the perception that "drugs in grocery store and street vendor" were low-cost alternatives compared with other healthcare facilities, which charged consultation and laboratory fees. Other reasons given included that "coughs and common colds are minor ailments, which can be easily self-diagnosed and do not necessitate medical consultation" and "antibiotics and/or antimalarial are safe drugs that can be used without medical consultation".

Table 1. *Characteristics of study participants and self-medication practices.*

Self-medication practice (n=101)	**P**		
	Yes = 89 (88.1%)	**No = 12 (11.8%)**	
Gender: male	43 (42,5)	9 (8,9)	NS
female	46 (45,5)	3 (2,9)	
Age			
15-25	16 (15,8)	1 (0,9)	
26-35	27 (26,7)	2 (1,9)	
36-45	18 (17,8)	4 (3,9)	NS
46-55	14 (13,8)	2 (1,9)	
55-6	11 (10,8)	3 (2,9)	
> 65	3 (2,8)	0 (0)	
Educational level			
Primary school or lower	37 (36,6)	3 (2,9)	
Secondary school	23 (22,8)	5 (4,9)	
High school	22 (21,8)	3 (2,9)	NS
University	7 (6,9)	1 (0,9)	
Occupation			
Primary sector	36 (35,6)	1 (0,9)	
Secondary sector	30 (29,7)	8 (7,9)	0,044
Tertiary sector	13 (12,8)	3 (2,9)	
Student	10 (9,9)	0 (0)	

Table 2. *Clinical signs for which antimalarial and antibiotics were used.*

Clinical signs	**n%**
Pain	68-76
Fever	32-35
Flu	28-31
Digestive symptoms	15-16,8
Dental caries	10-11,2
Asthenia	5-5,6
Others	6-5,9

Table 3. *Drugs used for self-medication.*

Self-medication agents	n=89%
Antalgics	79-88,7
Paracetamol	77-86,5
NSAI	14-15,7
Antibiotics	43-48,3
Amoxicilline	35-39,3
Cotrimoxazole	11-12,3
Tetracycline	5-5
Metronidazole	2-2,2
Antimalarial	20-22
Chloroquine	16-17,9
Sulfadoxine-Pyriméthamine	4-4,5
Quinine	1-1,1
Other drugs	20-22,4

NSAI: Non-Steroidal Anti-Inflammatory

4. Discussion

Our study shows that self-treatment with antibiotics/ antimalarials were highly prevalent (70%) among general population in Antananarivo, Madagascar. The prevalence of antimicrobial self-medication in low and middle income countries varied widely with some studies reporting as low as 4% in Yemen [7] to as high as 91,4% in Nigeria [8]. The overall estimate of antibiotic self-medication in low and middle income countries is 38.8%. Our result shows that self-medication with any antibiotic and/ or antimalarial is more common among employees of the primary sector ($p = 0.04$). This may indicate that the level of family income is a major determinant for self-medication. We did not find significant associations between gender, age, education and use of self-medication as in previous studies [9, 10]. However, our findings are consistent with the results of other studies, indicating that availability of antibiotics without prescription and misconceptions about the efficacy of antibiotics and/or antimalarial influence self-medication with these drugs [11, 12]. Studies in low-income countries showed that the cost of medical consultation and low satisfaction with medical practitioners were also relates to self-medication [13]. Most common indications for selfmedication were pain, fever and cough in our study which was similar to observations made in India, United Arab Emirates and Europe [14, 15, 12].

Antimalarials were used by 22.4% of respondents. This low incidence can be explained by the low endemicity of malaria in Antananarivo where this study was conducted. However, in areas of high endemicity of malaria in Madagascar, the prevalence of antimalarial self-medication ranged from 61.6% to 71%. Only 10.7% to 26.5% of people presenting fever consult medical practitioner [16]. Since 1989, home management of malaria was recommended by National Program for the Fight against Malaria in Madagascar (PNLP) due to high mortality rate of malaria in the 1980's [17]. In November 2003, pre-packaged antimalarial were introduced by an NGO and sold at the lowest price. Since March 2005, another form of pre-packaged chloroquine was distributed freely in health centers [16]. Unlike other African countries where Artemisini-based combination treatments was the most used self-prescribed antimalarial drugs [18], Chloroquine remains the most widely known antimalarial in Madagascar even though Artemisinin Combination Therapy (ACT) is the recommended first line medication for the treatment of malaria.

Antibiotics were used by 48.3% of respondents. In Madagascar, like many other developing countries [14, 19], there are no clear regulations or policies concerning the distribution and selling of antibiotics as over the counter drugs with no medical prescription. Amoxicillin is the most commonly used antibiotic for self-medication in our study; this may be related to its affordability compared to other antibiotics and its illicit sale. In Spain, Pakistan, Vietnam, India, Mexico, Argentina, Africa and several developing countries, it is possible to obtain antibiotics without a prescription. However, in most European countries, USA and Japan, antibiotics always require a prescription [20]. As our results show, the use of antibacterial drugs in treating viral infections was mostly reported in studies done in the Middle East [21] and Asia [22]. Viral infections require no antibiotics treatment. Furthermore, in bacterial infections, patients use antibiotics in short duration and the dose is insufficient. This can lead to emergence of antibiotic resistance [23].

Our result shows the expansion of illicit sale of drugs is the most factor associated with self-medication. Furthermore, the cost of drugs in pharmacies is more expensive than in grocery store or street vendors. Our result is similar to those reported in other developing countries. A study in Ethiopia shows that the availability of drugs at informal sectors: 19% in open market, 7.1% in kiosks and also retail drug outlets where majority of drugs (52, 4%) are obtained, contribute largely for rampant practice of self-medication [24]. Hussain et al. demonstrated also that drug retail outlets are cited to be the major sources of drugs used in self-medication and the availability of drugs in informal sector increase the practice of self-medication [25].

Self-medication is associated with risks such as misdiagnosis, overdose, and prolonged duration of use, drug interactions and polypharmacy [26], drug resistance, use of expired drugs. Self-medication can induce delayed diagnosis and appropriate treatment [27].

The results of this study should be interpreted keeping in mind some limitations. The sample size is small and unlikely to be representative as it only comes from one health facility. In addition, this study selects only "cooperative patients", where a small proportion of elderly patients.

5. Conclusion

Anti-malarial and antibiotic self-medication is highly prevalent in resource limited countries like Madagascar. The availability of these drugs in informal sector is the major determinant of self-medication. Drug law enforcement authorities need to have clear and effective legislation on drug handling and dispensing.

References

[1] WHO, "Guidelines for the regulatory assessment of medicinal products for use in self-medication," *In, vol. WHO/EDM/QSM/00.1.* Geneva, Switzerland: WHO; 2000. http://apps.who.int/medicinedocs/pdf.

[2] A. Blenkisopp, C. Bradley, "Over the counter drugs: patients, society and the increase in self-medication," *British Medical Journal*, vol 63, pp. 629-632, 1996.

[3] N. Asseray, F. Ballereau, B. Trombert-Paviot et al., «Frequency and severity of adverse drug reactions due to self-medication: a cross-sectional multicentre survey in emergency departments," *Drug Safety*, vol. 24, no. 14, pp. 1027-1037, 2001.

[4] M N. Ilhan, E. Durukan, S. Ö. Ilhan, F. N. Aksakal, S. Özkan, and M. A. Bumin, "Self-medication with antibiotics: Questionnaire survey among primary care center attendants," *Pharmacoepidemiology and Drug Safety*, vol.18, no. 12, pp. 1150-1157, 2009.

[5] P. W Geissler, K. Nokes, R. J Prince, R. A Odhiambo, J. Aagaard-Hansen, J. H Ouma, "Children and medicines: self-treatment of common illnesses among Luo schoolchildren in western Kenya," *Social Science & Medicine*, vol. 50, pp. 1771-83, 2000.

[6] C. P. Kiki-Barro, F. N. Konan, W. Yavo, R. Kassi, E. I. Menan, V. Djohan et al., "Antimalarial drug delivery in pharmacies in non-severe malaria treatment. A survey on the quality of the treatment: the case of Bouaka (Côte d'Ivoire)," *Sante*, vol.14, no. 2, pp. 75-79, 2004.

[7] A. Abdo-Rabbo, "Household survey of treatment of malaria in Hajjah, Yemen,". *East Mediterranean Health Journal*, vol.9, no. 14, pp. 600-606, 2003.

[8] K. P. Osemene, A. Laminkara, "A study of the prevalence of self-medication practice among university students in Southwestern Nigeria," *Tropical Journal Pharmaceutical Res*earch, vol. 11, no. 4, pp. 683-689, 2012.

[9] L. Grigoryan, F. M. Haaijer-Ruskamp, J. G. M. Burgerhof et al., "Self-medication with antimicrobial drugs in Europe," *Emergency Infectious Disease*, vol.12, pp. 452-9, 2006.

[10] A. G. Mainous, A. Y. Cheng, R. C. Garr et al., "Nonprescribed antimicrobial drugs in Latino community, South Carolina," *Emergency Infectious Disease*, vol. 11, pp. 883-888, 2005.

[11] A. Radyowijati, H. Haak, "Improving antibiotic use in low-income countries: an overview of evidence determinants," *Social Science &Medicine*, vol. 57, pp.733-744, 2003.

[12] L. Grygorian, J. G. Burgerhof, J. E. Degener, R. Deschepper, C. S. Lundborg, D. L. Monnet et al., "Determinants of self-medication with antibiotics in Europe: the impact of beliefs, country health and the healthcare system," *Journal of Antimicrobial Chemotherapy,* vol.61, no.5, pp. 1172-1179, 2008.

[13] R. D. Saradamma, N. Higginbotham, M. Nichter, "Social factors influencing the acquisition of antibiotics without prescription in Kerala State, south India," *Social Science & Medicine*; vol.50, pp.891-903, 2000.

[14] S. Badiger, R. Kundapur, A. Jain, A. Kumar, S. Pattanshetty, N. Thakolkaran et al., "Self-medication patterns among medical students in South India," *Australasian Medical Journal,* vol. 5, pp. 217-220, 2012.

[15] S. I. Shehnaz, A. K. Agarwal, N. Khan. A systematic review of self-medication practices among adolescents. *Journal of Adolescent Health*, vol.55, pp. 467-483, 2014.

[16] A. Ratsimbasoa et al., "Use of pre-packaged chloroquine for the home management of presumed malaria in Malagasy children," *Malaria Journal*, vol.5, pp.79, 2006.

[17] M. Randrianarivelojosia, A. Raveloson, A. Randriamanantena, J. Juliano, T. Andrianjafy, L. Raharimalala et al., "Lessons learnt from the six decades of chloroquine use (1945- 2005) to control malaria in Madagascar," 2007.

[18] R. K. Karnitalu, M. N. Aloni. High school students are a target group for fight against self-medication with antimalarial drugs: a pilot study in University of Kinshasa, Democratic Republic of Congo. *Journal of Tropical Medicine*, http://dx.doi.org/10.1155/2016/6438639.

[19] S. I. Al-Azzam, B. A. Al-Husein, F. Alzoubi, M. M. Masadeh, M. A. Al-Horani, "Self-medication with antibiotics in Jordanian population," *International Journal of Occupational Medecine and Environmental Health,* vol. 20, pp. 373-380, 2007.

[20] A. Mainous, W. Hueston, "Controlling antibiotic resistance: will we someday see limited prescribing autonomy?" *American Family Physician*, vol.63, pp. 1034-1039, 2001.

[21] M. Shehadeh, G. Suaifan, R. M. Darwish, M. Wazaify, L. Zaru, S. Alja'fari, "Knowledge, attitudes and behavior regarding antibiotics use and misuse among adults in the community of Jordan. A pilot study," *Saudi Pharmaceutical Journal*, vol.20, pp.125-133, 2012.

[22] A. Sihavong, C. S Lundborg, L. A. K. Syhakhang, G. Tomson, R. Wahlstrom, "Antimicrobial self-medication for reproductive tract infection in two provinces in Lao Peoples'Democratic Republic," *Sexually Transmitted Infections,* vol. 82, pp. 182-186, 2009.

[23] S. B. Patil. S. H. Vardhamane, B. V. Patil, J. Santoshkumar, A. S. Binjawadgi, A. R. Kanaki, "Self-medication practice and perceptions: among undergraduate medical students: a cross-sectional study," *Journal of Clinical and Diagnostic Research,* vol. 8, no.12, HC. 20-23, 2014.

[24] W. Solomon, A. Bebe G/Mariam, "Practice of self-medication in Jimma Town," *Ethiopian Journal of Health Development*, vol. 378, pp. 3, 2000.

[25] S. Hussain, M. Farnaz, M. Kazi, P. Ghazala et al, "Prevalence of self-medication and health-seeking behavior in a developing country," *African Journal of Pharmacy and Pharmacology,* vol. 5, no. 7, pp. 972-978, 2011.

[26] C. M. Hughes, J. C. McElnay, G. F. Fleming, "Benefits and risks of selfmedication," *Drug Safety*, vol.24, no.14, pp.1027-1037, 2001.

[27] L. Garofalo, G. Di Giuseppe, I. F. Angelillo. Self-medication Practices among Parents in Italy. BioMed Research International, http://dx.doi.org/10.1155/2015/580650.