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Evaluation of the Regulation of Antibiotics Consumption in Bujumbura, Burundi

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Abstract: Background: Antibiotic self-medication is highly prevalent in the developing countries. The objective of the study was to evaluate self-medication with antibiotics and the regulation of antibiotics consumption in the private and public pharmacies of the urban area of Bujumbura. Methods: A cross sectional study using self-administered questionnaire was conducted in private and public pharmacies of Bujumbura. 460 clients were randomly chosen and 32 sellers randomly selected from January to September 2015 and interviewed. Results: Of the 460 participants, 186 (40.43%) practiced self-medication to antibiotics. The average age was 34.89 years. Abdominal pain was the first motivation to practice self-medication (20.8%). Amoxicillin was the antibiotic most commonly used (47.3%). Inaccessibility to health care facilities due to the lack of financial resources was cited to be the root of this phenomenon (62%) and these antibiotics were mostly acquired from community pharmacies without prescriptions (84.4%). Conclusions: The high cost of care and the low level of study of the patients are factors favoring this phenomenon. A national policy for regulation use of antibiotics without a medical prescription and an educational program to general population on the effective use of antibiotics are therefore needed.

Key words: Self-medication, antibiotics, pharmacies, amoxicillin, Burundi.

1. Introduction

Self-medication can be defined as the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms [1-3]. Antibiotics represent one of the most prescribed drugs worldwide and their resistance is a major public health threat, hence the need for research on antibiotic use patterns to help develop appropriate interventions [3]. A report of the WHO in April 2014 first looked at antimicrobial resistance, including antibiotic resistance, and globally revealed that this serious threat is no longer a prediction for the future, it is happening right now in every region of the world and has the potential to affect anyone, of any age, in any country [4]. The prevalence of self-medication is more in low to middle income communities and is more common in countries where prescription legislations are not strong enough and drugs are available over the counter [5]. Pharmacists are often the first point of contact for patients with symptoms and play a central role in advising patients on minor illnesses and referring them to their physicians [6].

According to a survey done in 2007 in Abidjan, 21% of antibiotics were delivered on a patient's request and 14% were suggested by pharmacists [7]. In Nairobi, a study on the prevalence and factors influencing self-medication with antibiotics among adult outpatients attending Kenyatta National Hospital noted that 53.5% of subjects practiced self-medication with antibiotics [8]. In Burundi, antibiotic resistance has become a growing concern. There is no policy for regulation the use of drugs. Our research focused on

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self-medication with antibiotics among clients of pharmacies in the urban area of Bujumbura, Burundi.

2. Methods

2.1 Study Design and Setting

This was a cross-sectional descriptive study including 460 adults, who visited the 26 private and 6 public pharmacies of the urban area of Bujumbura from January 2015 and September 2015. These patients were asked to answer an anonymous questionnaire regarding their use of medicines in the eight months preceding the present illness. We alternated visits of pharmacies by staying 15 days in each one. Selection of the participants was done by systematic random sampling, each 4th or 5th person was asked to complete the questionnaire. Questionnaires were administered only after signed or thumb-printed consents.

2.2 Survey Tool

The questionnaire collected demographic data such as age, gender and education level of the participants. Respondents were asked whether they had used antibiotics during the last eight months. Those who confirmed antibiotic usage with self-medication were asked what symptoms they used the antibiotics for, why and how they obtained the antibiotics and what prompted them to use these antibiotics.

In parallelism, another questionnaire was given to 32 sellers of the total pharmacies we visited and questions about self-medication to antibiotics and selling antibiotics without prescription asked. We chose one seller in each pharmacy we visited.

2.3 Data Analysis

We analyzed data with EpiInfo (Version 3.5.3). The proportions were compared with Fisher's exact test. P value was calculated by setting the reference value and comparing it with other values. A p value of 0.05 was used as a cut-off point of statistical significance.

3. Results

3.1 Socio-demographic Characteristics of the Respondents

Among 460 participants, the use of antibiotics within the past 8 months was reported by 186 (46%) of whom females were 92 (49.5%) and males were 94 (50.5%). The average age was 34.89 years. For sex, age and educational levels no observed statically significant differences were found among self-medicated and no self-medicated participants (Table 1).

3.2 Antibiotic Self-medication Practices

Of the 186 self-medicated participants, 106 (58.6%) have not information about the use of antibiotics.

Table 1 Socio-demographic characteristics.

Variables	Self-medication (N = 186)		No self-medication (N = 274)		p
	Frequency	Percent	Frequency	Percent	
Sex					
Male (Ref)[1]	94	36.43	154	63.57	0.25
Female	92	43.39	120	56.61	
Age (years)					
[18-30] (Ref)[1]	84	39.43	129	60.57	
[31-50]	82	42.27	112	57.73	0.61
[51-69]	20	37.73	33	62.27	0.87
Level of study					
Illiterate (Ref)[1]	12	12.24	86	87.76	
Primary	45	39.47	69	60.53	9.85
Secondary	74	66.07	38	33.93	4.67
University	55	51.88	51	48.12	1.05

Test used for proportion comparison is Fischer's exact test; [1] Reference value.

Furthermore, 157 participants (84.4%) declared that antibiotics used for self-medication were from community pharmacies and 3 participants (5.4%) said that they used antibiotics kept from their last prescription. Our study noted 192 reasons of self-medication. Inadequate access to healthcare due to the lack of financial resources was the main cause with 108 responses (62%) followed by the consideration of the last prescription of the physician for the same symptoms (Table 2).

The principal symptoms leading the antibiotics self-medication were abdominal pain (20.8%), cough (19.1%) and diarrhea (10.7%) (Table 3).

Table 4 displays the antibiotics that were most

Table 2 Reasons to self-medication with antibiotics.

Reasons	Frequency (N = 192)	Percent
Lack of financial resources enabling access to healthcare	108	56.25
Consideration of the last prescription of the physician for the same symptoms	52	27.08
Avoiding queues in public health services	25	13.02
Ignorance of the importance of visiting physicians	6	3.12
Self-assessment of an emergency situation	2	1.04
Trusting the pharmacist	1	0.52

Table 3 Symptoms leading to self-medication to antibiotics.

Symptoms leading to self-medication to antibiotics	Frequency	Percent
Abdominal pain	45	20.8
Cough	37	17.1
Diarrhea	20	9.25
Infuenza like illness	15	6.94
Throat pain	10	4.62
Skin wound	9	4,16
Dysuria	7	3.24
Chest pain	7	3.24
Toothache	5	2.3
Fever	5	2.3
Uretral discharge	5	2.3
Lumbar pain	5	2.3
Epigastric pain	5	2.3
Asymptomatic	4	1.85
Vaginal itch	4	1.85
Vaginal discharge	4	1.85
Breast pain	4	1.85
Painful urination	4	1.85
Asthenia	3	1.38
Infectious syndrom	3	1.38
Skin itch	3	1.38
Oral wound	3	1.38
Skin infection	3	1.38
Hemoptysis	1	0.46
Gingival bleeding	1	0.46
Acute gastroenteritis	1	0.46
Febrile acute gastroenteritis	1	0.46
Cervical nodes	1	0.46
Epistaxis	1	0.46

Table 4 Commonly used antibiotics in self-medication.

Antibiotics	Frequency	Percent
Amoxicillin	88	47,3
Ciprofloxacin	61	32,7
Cotrimoxazole	14	7,5
Cloxacillin	8	4,3
Amoxicillin + clavulanic acid	5	2,7
Metronidazole	5	2,7
Doxicyclin	2	1,1
Penicillin V	2	1,1
Azithromycin	1	0,53

frequently used for self-medication. Amoxicillin (47.3%) was most frequently misused followed by ciprofloxacin (32.7%) and cotrimoxazole (7.5%). Other antibiotics were found in low rate.

Of the 32 pharmacy selling agents interviewed, 30 (93.7%) responded they often ask a written prescription from those willing to buy antibiotics and 2 (6.25%) always ask for the prescription. Twenty-six (82%) of the pharmacy selling agents accepted that they always sell non-prescribed antibiotics. All the sellers who participated in the study said not to know any law prohibiting antibiotics commercialization without a prescription in Burundi.

4. Discussion

Antibiotics should not be dispensed without a prescription because availability of these over the counter will almost invariably result in self-medication and ultimate resistance. This would certainly be more common in poor countries with high costs of health care and this has been shown by our findings. In our study, the prevalence of self-medication with antibiotics was 46%. This rate is very high compared with results conducted in Jordan with a prevalence of 39.6% [9] and 21% in Lithuania [10]. Self-use of antibiotics is also very common in Sudan where the study taking in account self-medication with antimicrobial in general finds a prevalence of 48% [11]. Other authors find high rates than ours. In 2010, Kwamboka [8] finds that 53.5% of the participants practice self-medication to antibiotics. Abobak et al. in Abu Dhabi released in 2009, 56% of frequency [12]. On the other hand, a study realized in Jordania in 2007 gives lowest results (23%) [7]. This shows that the practice of antibiotics self-medication is a worldwide problem and is high and varies in different communities. This could be due to the difference in the effectiveness of regulations on antibiotic self-medication in different resource limited countries. Then the major problem of misuse of antibiotics is to develop bacterial resistance [13].

According to our study, abdominal pain is the first symptom leading to antibiotics self-medication with a frequency of 20.8%. Cough is the second motivation (17.1%) followed by diarrhea (9.25%). Our findings note that gastrointestinal and respiratory tract is the most affected systems in our patients. This joins the meta-analysis of Ocan, et al. which noted that 79.1 % of reported symptoms were related to infections of respiratory tract, gastrointestinal system, eye, ear, urinary system, skin and malaria as the reason for self-medication [14]. A study on self-medication to antibiotics by Sheraz, et al. in the urban area of Peshawar showed that fever was the first symptom motivating self-medication to antibiotics (70%) followed by throat pain (22%) [5]. Other results confirm that symptoms like cough, throat pain, thoracic pain related to pathologies of the respiratory airways motivate most self-medication to antibiotics. At the same time, the WHO declared that 75% of respiratory pathway pathologies have a viral origin, reason why unjustified self-medication to antibiotics can lead to resistances [4]. Multiple studies showed that amoxicillin was in first position in medicines used in

this practice [7, 8, 10, 11] while amoxicillin-clavulanic acid was found in first position in the urban area of Peshawar [5]. This omnipresence of the molecule of amoxicillin in our results can be explained by the fact that the group of beta lactamines is most of the time used for pathologies of the respiratory pathway in outpatients consultation , and consequently they are the most known of the public. In the review of Ocan et al., the major categories of antimicrobial agents reportedly used in self-medication included 50% of antibacterial with ampicillin, tetracycline, penicillin, metronidazole, ceftriaxone, kanamycin, ciprofloxacin, amoxicillin, fradiomisin-gramisidin, norfloxacin and doxycycline [14]. Furthermore, 84.4% of the participants declared that the self-medicated antibiotics were from community pharmacies and 5.4% used antibiotics kept from their last prescription. Litterature reported that the source of medicines used in self-medication is drug sellers or pharmacists and relatives or friend and the other reported sources include past successful use and drug leaflets. In 2007, a survey showed that 21% of antibiotics used for self-medication were delivered by pharmacies in Abidjan for responding to a client's request and in 14% of the cases; it was an advice of sellers' pharmacies [7]. Those results show importance of regulating medicine consumption, especially antibiotics. The underlying challenges of health systems in most low and middle income countries such as inadequate healthcare potentially influence use of self-medication [15]. The lack of policies or their inadequate implementation enables easy over-the-counter access of antibiotics. In Uganda, a study found that over half (59.3%) of community members who practiced antimicrobial self-medication were not aware of any restrictions on their non-prescription use in the country [16]. This occurs in spite of the existence of national drug policy formulated in 2002 which limits antibiotics to prescription only use.

Inadequate access to healthcare due to the lack of financial resources was the main cause leading to self-medication. In the review of Shaghaghi A et al high costs of visiting a professional health care provider was among frequently reported factors to adopt self-medication behavior included low perceived seriousness of disease, lack of sufficient time to visit a physician, easy purchase of medications, and having experience of good results from previous self medication [17]. In low income countries, poverty is on of the main factors of sel-medication. Nevertheless, this study did not focus on exploring the relation between monthly income and self-medication with antibiotics.

However in this study, most of drug sellers often ask a written prescription from those willing to buy antibiotics, 2 always ask for the prescription and 84.4% of the sellers accepted that they sell always non-prescribed antibiotics. All the sellers who participated in the study said they don't know any law prohibiting antibiotics commercialization without a prescription in Burundi. Non-prescription use of antibiotics without relevant information on how to take them, indications, adverse effects and contraindications could potentially expose patients to the risk of inappropriate drug use [18].

In addition, participants were generally intellectual and educated. Therefore, the sample might not be representative of the whole population of the country. Since the participants were self-reporting via the questionnaire, we cannot be certain that we received all the relevant information related to their complaints and medicines (in terms of receiving or buying). Such bias may impact upon our results, but is difficult to avoid in questionnaire-based studies. While this study was the only assessment of self-medication in the country, future studies would ideally follow participants over time to gain a deeper insight into self-medicating behaviors.

5. Conclusions

The study revealed a considerable rate of self-medication in the urban area of Bujumbura,

Burundi, which should drive the attention of the authorities to this problem. High cost of health care facilities increase the risk of self-medication to antibiotics. Further, this situation is aggravated by the lack of legislation related to it. Symptoms of the gastrointestinal system and respiratory tract are the most common to lead to antiobiotics self-medication. To reduce the rate of this phenomenon, educational programs for the general public should be initiated and the physicians should instruct their patients not to use the prescribed medications for upcoming conditions, but for the current ones. Also, legislation should facilitate the access to health care and implement a law to limit the purchase of antibiotics without a prescription. This study will influence to implement a national policy to monitor the sale of medicines.

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