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EVALUATION OF DRUGS CONSUMPTION IN HOSPITAL SERVICES OF YAOUNDÉ UNIVERSITY TEACHING HOSPITAL, CAMEROON

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ABSTRACT

Background. Health facilities use large quantities of different groups of chemical compounds such as disinfectants, solvents, and drugs which all present a certain level of risk**.** For drugs in particularly, it is important to know the type and quantities used, in order to investigate risk assessment to the environment and human health**.** **Methods.** A survey therefore was conducted for 4 months in the University Teaching Hospital of Yaoundé; (CHUY), in order to establish the list of the most consumed drugs in 2014. This was based on the medical files in the hospitalization services (pediatric, gynecology, reanimation and intensive care unit, emergency, internal medicine). **Results**. Antiparasitics (artesunate and artemether) were the most used drugs, followed by antiacids, anagelsics, antihypertensives and antibiotics. **Conclusion.** The high use of drugs found in hospital waste water could have serious consequences on the environment and therefore the need for control and regulation of these drugs in hospital waste water and proper disposal channel system to be developed.

KEY WORDS: CHUY, environment, drugs consumption, hospital services, Yaoundé Cameroon.

INTRODUCTION

Health facilities have to use large quantities of many chemical compounds such as disinfectants, solvents, and drugs.[1] However, all these xenobiotics can be a source of environmental pollution**.** The knowledge of the classes and volumes of drugs consumed is very important because it indicates which of these compounds are a priority and of relevance to study the environmental risk. These data are difficult to obtain, because they represent an important commercial value. In fact in some countries, pharmaceutical laboratories have to inform health and environmental security agencies (Environemental Protection Agency, Food and Drug Administration, Agence Francaise de Sécurite Sanitaire et Environnementale) on the quantities manufactured for each product.[2] Even with this information, the estimation of total quantity for each active principle is difficult because of their various packaging or the fact that some are mixed and has been done only for few products.[3]

This problem remains the same in most countries, even developed ones, limiting accessible data.That is why a study was conducted to evaluate drugs consumption in hospital services of the Yaoundé University teaching hospital.

MATERIALS AND METHODS

This was an observational descriptive and analytical study conducted for 4 months in Yaoundé University teaching hospital, Cameroon. This study was done with drugs consumed in the course of 2014 in hospitalization services of CHUY. The survey was conducted in hospitalization services of CHUY emergencies, medicine, polyvalent recovery gynecology, pediatric, surgery from 23th January to 1st April 2014.

Sample collection

We were interested in medical files of patients admitted in CHUY in the period from 1st January to 31st December 2014, in order to take an inventory of the drugs consumed. We established an approach in many steps in order to progressively filter the molecules. It permitted us to get rid of compounds that did not constitute strictly active principles and/or which were strongly biodegradables like mineral salts (sodium

chlorohydrate), sugar (glucose), proteins (parenteral feeding or growth factors), vitamins(vitamin A) and natural hormones (cortisol). We could also get rid of the following, substances whose doses did not expressed in measured units (pomades, insulin), antidotes(because they were not frequently used).

Analysis of data

Drugs were classified according to their generic names and therapeutic classes. We then determined the quantities consumed by each service. Therefore, each class percentage in all services and in each service was calculated just as the percentage of each drug per therapeutic class.Data was analyzed with Microsoft Office Word and Excel 2010.

RESULTS

Drugs were classified following their generic names and therapeutic classes. At the end we found 176 active principles and 23 therapeutic classes as shown in Table 1. After this classification, we determined the quantities consumed for each class in each service of hospitalization which allowed us to obtain the percentage of each therapeutic class in total consumption of drugs at CHUY in 2014.

Antibiotics represented the most consumed class with 37.29 %, followed by anti-parasitics (31.31 %), then anti-hypertensive (10.47 %), antacids (9.38 %) and finally analgesic and anti-inflammatory (7.85 %). Figure 1 represents the consumption percentage of each therapeutic class per service in 2014 in CHUY. The most consumed classes among the 17 classes were antibiotics, anti-parasitics and analgesics/anti-inflammatory.

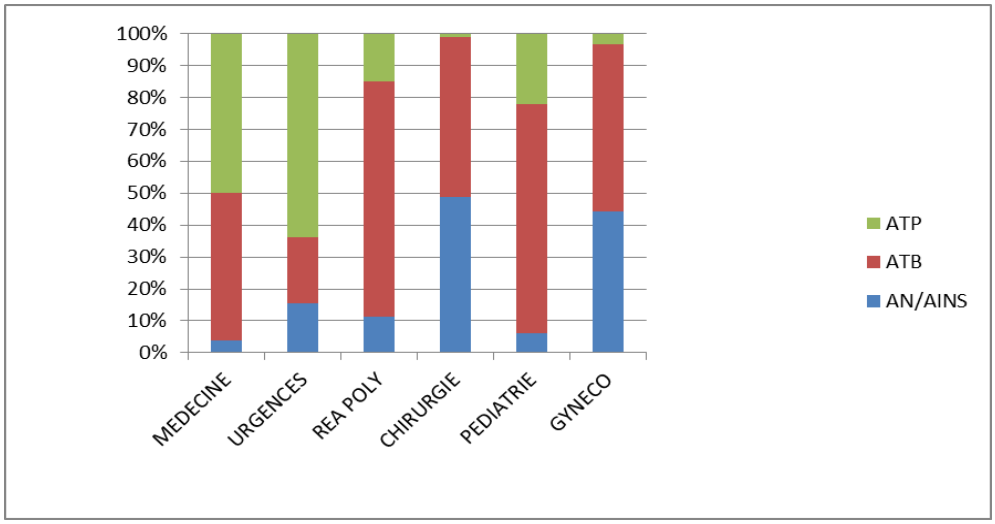

Figure 1: Percentage of each therapeutic class consumption in different services.

ATP=Antiparaisitics; ATB=Antibiotics; AN/AINS= Analgesics/nonsteriodal antiinflamatory.

In the antibiotics class, betalactamines were the most consumed with a percentage of 41.17 % with amoxicillin as the lead compound. This class was followed by anti-tubercular at 29.71 % with pyrazinamide as lead compound, then sulfamides at 11, 82 % sulfamethoxazole as lead compound; and finally, fluoroquinolones at 10.99 % with levofloxacine as lead compound and the others subclasses (figure 2).

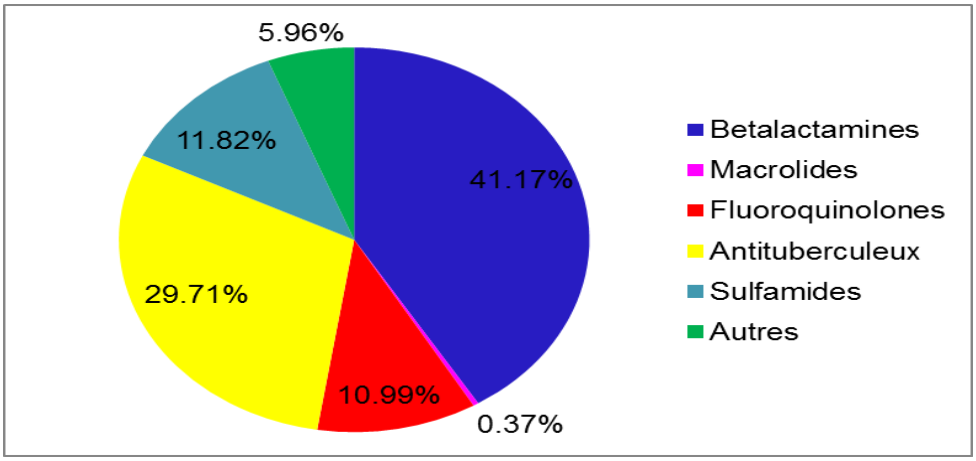

Figure 2: Percentage of each subclass in antibiotics class.

In the antiparasitics class, antimalarial drugs were the most used, represented mostly by artemether and artesunate (Figure 3).

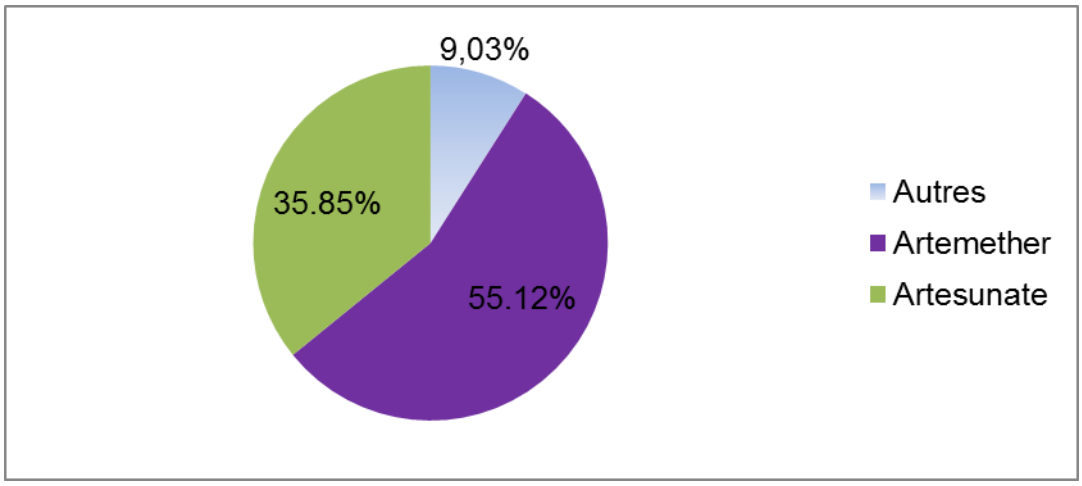

Figure3: Percentage of each subclass in antiparasitics class.

Concerning hypertensive diuretics, beta-blockers and calcic inhibitors were the most used in the hospital (figure 4). They were represented respectively by furosemide, labetolol and nicardipine.

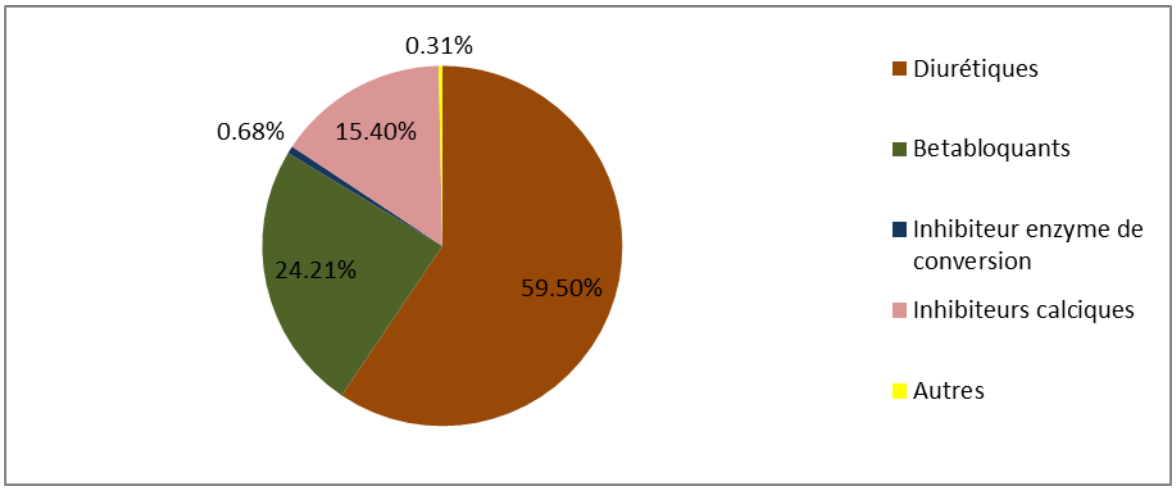

Figure 4: Percentage of each subclass in antihypertensives class.

Hydrogen inhibitors pomp were the most used, mainly omeprazole, in the class of antacids as shown in figure 5. Among all the anti-inflammatory drugs and analgesics used in the hospital in the course of the year 2014, antalgics were the most represented (92.61 %) with paracetamol as major compound (figure 5).

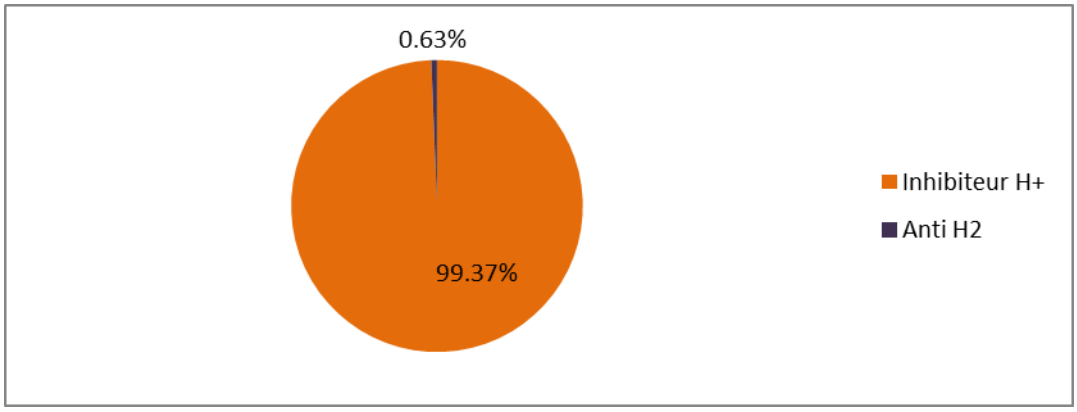

Figure 5: Percentageof each subclass in anti-ulcerous.

In the sub class of analgesisc and anti-inflammatory the highest class of 92.61% was recorded in the analgesics class and only 5.74% and 1.65 % was recorded in the steroidal and non-steroidal anti-inflammatory (NSAIDS) respectively (Figure 6).

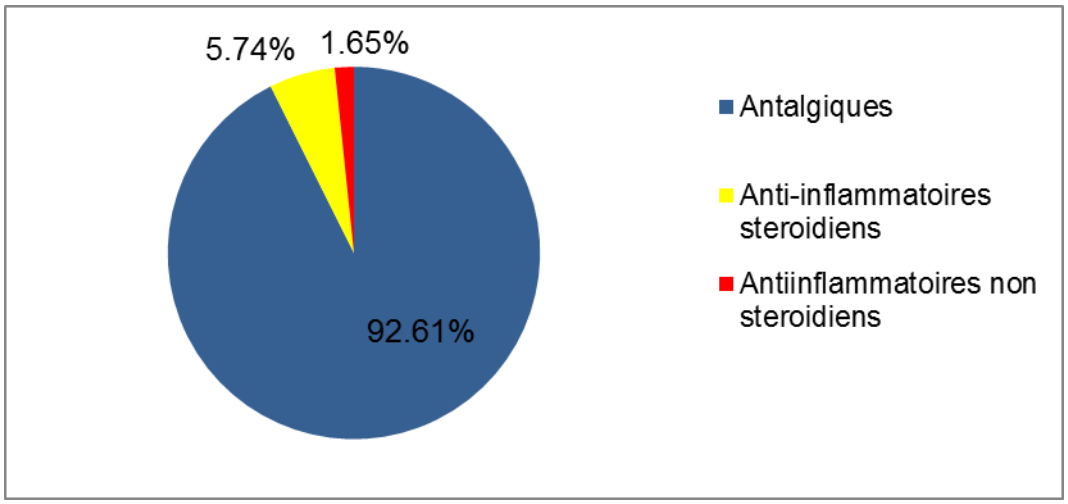

Figure 6: Percentage of each subclass in analgesics and anti-inflammatory class.

DISCUSSION

Antibiotics represented the most consumed class with 37.29%, followed by antiparasitics (31.31%), then anti-hypertensive (10.47%), antacids (9.38%) and finally analgesic and anti inflammatory (7.85%). This could be justified by the fact that according to the epidemiological profile of Cameroon, bacterial infections are not rare, the rate of cardiovascular diseases in the population is still growing and pain constitutes the first health concern for consultation.[4]

Artemether (17,262 %) and artesunate (11,225%) were found to be the most consumed compounds in CHUY. One of the reasons of their high use could be the endemic nature of malaria in Cameroon. Another reason could be the therapeutic protocols of malaria in all hospitals where the treatment of malaria is made in monotherapy by artemether, artesunate or quinine.[4]

Omeprazole with 9,230% was found in the 3rd place on the list of all drugs consumed by the hospital. Its use in prevention of stress ulcer in the hospitalized patients could be one of the reasons of its high use. Amoxicillin was listed as the 4thmost consumed drug in CHUY (8.675%). This could be linked to its first line use in the therapeutics protocols of infections which constituted an object of consultation.

At the 5th place, we observed paracetamol (6,832%) whose use was linked to its analgesic and antipyretic activities generally associated to malaria treatment and infections. Furosemid (6,205%) was the most used antihypertensive and the 6th most consumed; then attesting the high prevalence of cardiovascular diseases in Cameroon and its use in emergency.[5]

Pyrazinamide (4,923%), levofloxacine (4,039%) and sulfamethoxazole (3,170%) were respectively at 7, 8 and 9th place in the list of the most consumed inside the hospital. Their use was linked to the high rate of tuberculosis, the use of sulfamethoxazole as a preventive drug for patients having tuberculosis and sexual infections being one of the reasons of the consultation.[6]

CONCLUSION

In order to establish the list of the most consumed drugs in CHUY in 2014, we made a survey within this hospital. We found that antibiotics, antiparasitics, antihypertensive, antacids and analgesics/anti-inflammatory were the five classes of drugs most consumed at CHUY. The consumption of a drug can inform on its potential presence in the environment. The high use of drugs found in hospital waste water could have serious consequences on the environment and therefore the need for control and regulation of these drugs in hospital waste water and proper disposal channel system to be developed.

REFERENCES

1. Jolibois B &Guerbet M. Evaluation of industrial, hospital and domestic wastewater genotoxicity with the Salmonella fluctuation test and the SOS chromotest. *Mutat. Res*., 2005; 565: 151-162.
2. Togola Anne. Présence et devenir des substances pharmaceutiques dans les écosystèmes aquatiques. Thèse de Doctorat en Biogéochimie de l'Environnement. EcoleDoctorale Science du vivant, Géovivant, Sciences de l'Environnement: Université Bordeaux1, 2006: 331p.
3. Boulanger, G. Elaboration d'une base de données destinée à sélectionner les résidus de médicaments d'intérêt pour la sécurité sanitaire des eaux de boisson: étude de faisabilité. Master «Evaluation et gestion du risque sanitaire lié à l'environnement». Université Paris V – Université Paris XI – Ecole Nationale deSanté Publique, 2005: 85 p.

4. Ministère de la Santé Publique, République du Cameroun. Stratégie sectorielle de la santé 2001-2015. 2009: 130p.
5. Rua-Gomez P C, Puttmann W. Impact of waste water treatment plant discharge of lidocaine, tramadol, venlafaxine and their metabolites on the quality of surface waters andground water. *J. Environ. Monit.*, 2012 May; 14(5): 1391-9.
6. Verlicchi P, Al Aukidy M, Galletti A, Petrovic M, Barceló D. Hospital effluent: Investigation of the concentrations and distribution of pharmaceuticals and environmental risk assessment.*Sci Total Environ*., 2012a; 430: 109–18.