

Consumption of Antihypertensive Drug in the Urban Area of Abobo (Abidjan, Ivory Coast)

Gbongue Eric Tia^{1*}, Ahou Axelle Edith Kouadio², Amara Kamagate³,
Moulad Ephraïm Alliman², Goldberg Merveille Kouassi⁴,
Amankou Donald Jean-Fabius Ahua⁵, Kouakou Emmanuel N'Gbra⁶,
Assande Ange Auguste Effe⁷, Bosson Benjamin Aka⁸, N'Doua Gisèle Kouakou-Siransy⁹

¹Department of Pharmacy, Infectious and Tropical Diseases Department, Treichville University Hospital, Abidjan, Ivory Coast

²Department of Pharmacy, Angré University Hospital, Abidjan, Ivory Coast

³Department of Pharmacy, Gynecology Department, Treichville University Hospital, Abidjan, Ivory Coast

⁴Department of Pharmacy, Dermatology Department, Treichville University Hospital, Abidjan, Ivory Coast

⁵Department of Biochemistry of the Alassane Ouattara National Radiotherapy Center, Abidjan, Ivory Coast

⁶Department of Pharmacy of Cocody University Hospital, Abidjan, Ivory Coast

⁷Department of Biochemistry of the Pasteur Institute of Ivory Coast, Abidjan, Ivory Coast

⁸Health Worker Training Institute, Ivory Coast, Abidjan, Ivory Coast

⁹Department of Pharmacology, Hospital and Therapeutic Pharmacy and Human Physiology, Abidjan, Ivory Coast

Email: *tiagbongueeric@gmail.com, axellekouadio225@yahoo.fr, amsokamagate07@gmail.com,

allimanmouladephraim@gmail.com, Kouassimerveille239@gmail.com, ahuaud34@gmail.com, Mbraemmanuel25@gmail.com,

augusteeffo@gmail.com, akaboss_b@yahoo.fr, giselekouakou@yahoo.fr

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Abstract

In Ivory Coast, arterial hypertension is 20.4% prevalent, with a high mortality rate. However, proper use of antihypertensive drugs can reduce the risks of morbidity and mortality associated with the disease. The aim of this study was to determine the pattern of antihypertensive drugs in an urban population in Abidjan. To this end, a retrospective descriptive study was conducted. Data were collected from the consumption histories of several pharmacies in the Abobo commune of Abidjan between March and August 2020. Drugs available in pharmacies and containing one or more active ingredients in the ATC classification of antihypertensives were included. A total of 1082 sales of antihypertensives were recorded, with 53% of medicines containing a single molecule and 46% containing combinations of two molecules. Antihypertensives containing one active compound showed a high proportion of diuretics (28.7%), followed by calcium antagonists (20.35%) and beta-blockers (19.13%). The combination of ACE inhibitors and calcium antagonists was sold at 34.71%, with the combination of calcium antagonists/ACE inhibitors + diuretics (45.46%) in the two and three-molecule classes respectively. All in all, the study showed the patients were satisfied with the use of antihypertensives, with fu-

roseamide and the amlodipine/perindopril combination at the top of the list.

Keywords

Consumption, Antihypertensives, Hypertension

1. Introduction

Hypertension is a major public health problem worldwide, particularly affecting urban populations in sub-Saharan Africa [1]. However, there are so-called “anti-hypertensive” drugs used to normalise excessively high blood pressure [2]. These drugs can be prescribed as monotherapy or as a fixed or loose combination. Their use must take into account not only blood pressure levels but also cardiovascular risk factors and complications [3] [4].

Given the progressive rise in the prevalence of hypertension, the consumption of antihypertensive drugs in OECD countries increased by an average of 70% between 2000 and 2017 [5].

In fact, studies show that their consumption has been increasing for several decades, as have medicines in general, and varies from one region to another as a result of growing demand [5] with the prevalence of the disease in Côte d’Ivoire estimated at 20.4% in 2018 [6]. There is significant urbanisation in Côte d’Ivoire and the expansion of the capital Abidjan is increasingly encouraging the creation of urban neighbourhoods, of which the commune of Abobo, located in the northern part of the city, represents one of the most urbanised communes with a prevalence (18.01% in 2016) considered to be one of the highest in this health region [7].

Notwithstanding the wide choice of antihypertensive molecules available and the increasing accessibility to antihypertensive drugs, persistent challenges remain with regard to adherence to treatment and optimisation of treatment regimens in urban Africa [1].

In order to assess the effectiveness of current treatments and identify any gaps in their use or accessibility, we conducted this study to determine the proportion of different antihypertensive agents in the prescriptions of hypertensive patients living in an urban area of Abidjan.

2. Methodology

The method used in this study was retrospective and descriptive. Data were collected from the consumption records of pharmacies between March 2020 and August 2020, *i.e.*, six months of consumption. The pharmacies concerned were located in the city of Abidjan (the largest city in Ivory Coast) and more specifically in the commune of Abobo, as this is the commune with the largest proportion of inhabitants and in which the prevalence of the disease is high. The choice of pharmacies was based on demographic characteristics in terms of population and proximity to a referral centre with services that, a priori, allow antihypertensive

(anti-HTA) prescriptions. The study population consisted of all patient-clients who had visited these pharmacies during the study period.

Inclusion concerns drug products available in the pharmacies that contain one or more active ingredients included in the ATC classification of antihypertensives [8]. When an anti-HTA existed in several pharmaceutical forms, only the oral form was considered.

Medical pharmacy routine management software was used as the database. The sales option made it possible to view monthly sales statistics for each product over a 12-month period. Biases were found in the estimated consumption of antihypertensives. It should be noted that the consumption of an anti-HTA could be estimated in error and was conditioned by its availability in the pharmacy or the prescribing habits of doctors. In the majority of cases, these aspects of the sale led to the sale being cancelled and patient-clients being referred to other pharmacies. Also, due to the sensitive nature of the therapeutic class, substitutions of medicines by generics were not strongly recommended or accepted by customers.

Excel 2016 was used to record and process the data. The distribution of the number of molecules per antihypertensive, the therapeutic classes and the major active ingredients were expressed as numbers and percentages.

3. Results

A total of 1082 sales of antihypertensive drugs were recorded during the study period, including 575 sales of antihypertensive drugs containing one active molecule and 507 anti-hypertensive drugs containing more than two active molecules (Table 1).

Table 1. Consumption of medicinal products by number of active ingredients.

Number of active ingredients per drug	Effective	Percentages
An active ingredient	575	53%
More than one active ingredient	507	47%
Two active ingredients	497	98%
More than two active ingredients	10	2%
Total	1082	-

As for the distribution of molecules in the group of antihypertensives containing one active molecule, shown in Figure 1, there was a high proportion of diuretics (28.7%), followed by calcium antagonists (20.35%) and beta-blockers (19.13%). The combination of ACE inhibitors and calcium antagonists was sold at 34.71%, with the combination of calcium antagonists + ACE inhibitors + diuretics (45.46%) in the two-molecule and three-molecule antihypertensive groups respectively (Figure 2). Figure 3 shows the combinations of three therapeutic classes identified in the study.

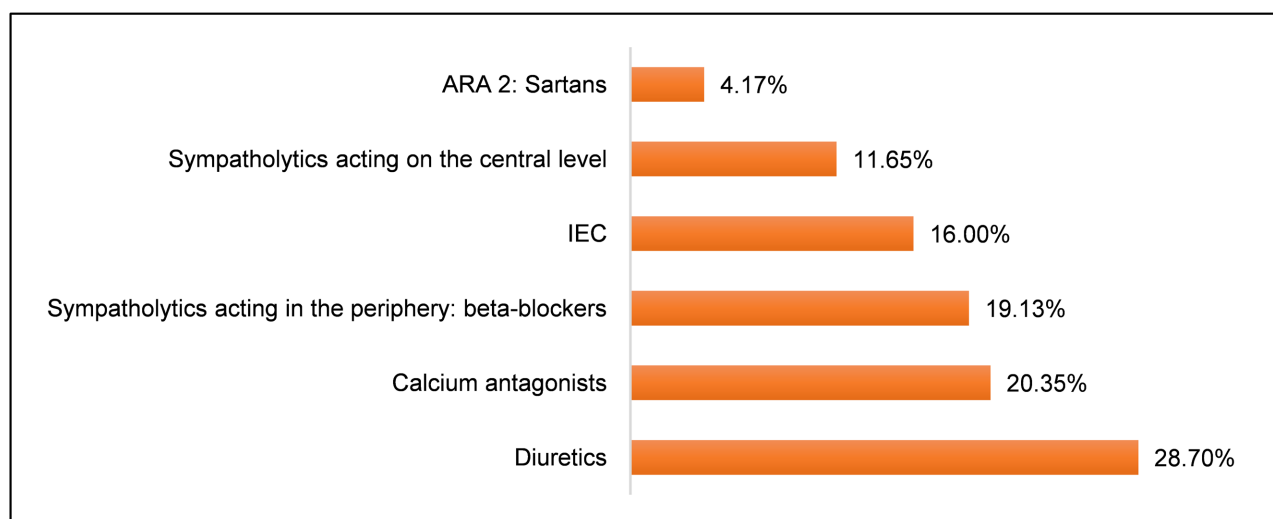


Figure 1. Presentation of therapeutics classes in monotherapy.

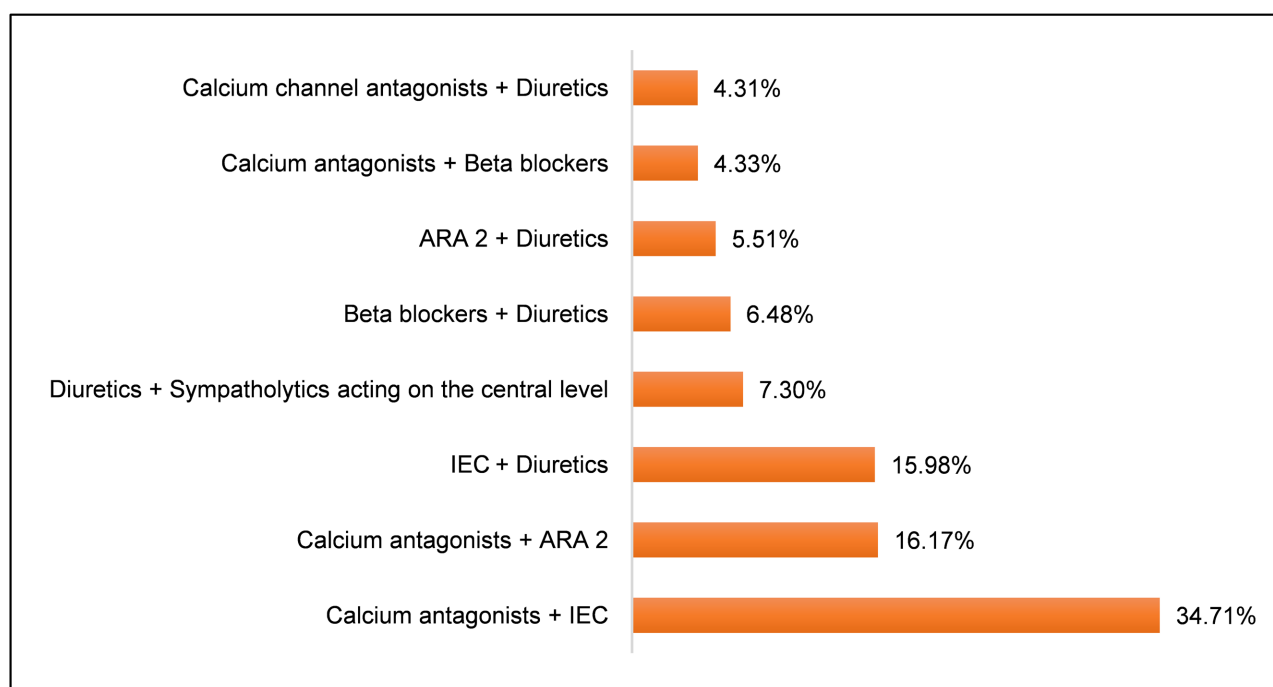


Figure 2. Presentation of therapeutics classes in biotherapy.

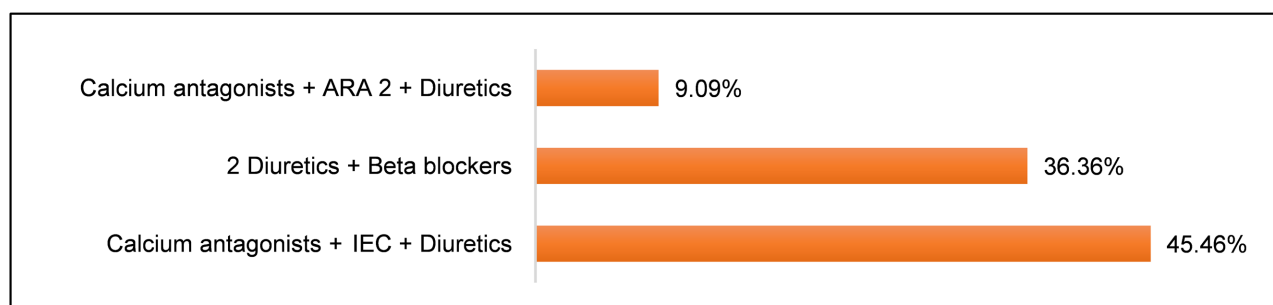


Figure 3. Presentation of therapeutics classes with three or more therapies.

A list of the most representative compounds in the various therapeutic classes was also drawn up (**Table 2**).

Table 2. Distribution of drug by therapeutic class (IEC: Inhibitors of the converting enzyme; ARB 2: Angiotensin 2 receptor antagonists).

Pharmacotherapeutic classes	Major active ingredients
An active ingredient	
Diuretics	Furosemide
Calcium antagonists	Amlodipine
Sympatholytics acting in the periphery: beta-blockers	Bisoprolol
IEC	Captopril
Sympatholytics acting on the central level	Methyldopa
ARA 2: Sartans	Losartan
Two active ingredients	
Calcium antagonists + IEC	Amlodipine + Perindopril
Calcium antagonists + ARA 2	Amlodipine + Irbesartan
IEC+ Diuretics	Captopril + Hydrochlorothiazide
Diuretics + Sympatholytics acting on the central level	Bendroflumethiazide + Reserpine
Beta blockers + Diuretics	Atenolol + Chlortalidone
ARA 2 + Diuretics	Losartan + Hydrochlorothiazide
Calcium antagonists + Beta blockers	Amlodipine + Atenolol
Calcium channel antagonists + Diuretics	Amlodipine + Indapamide
Three active ingredients	
Diuretics + Diuretics + Beta-blockers	Hydrochlorothiazide + Amiloride + Timolol
Calcium antagonists + IEC + Diuretics	Amlodipine + Perindopril + Indapamide
Calcium channel antagonists + ARB 2 + Diuretics	Amlodipine + Valsartan + Hydrochlorothiazide
	Amlodipine + Losartan + Hydrochlorothiazide

4. Discussions

Africa has the highest prevalence rate of hypertension in the world with 46% of people aged over 25 years [9]. The study was carried out to find out the consumption trends of anti-HTA drugs in an urban population. Among the anti-HTA drugs consumed, those containing a single active ingredient were preferred to combinations of molecules. Although the sale of a drug containing a single active ingredient does not systematically induce monotherapy, this trend, compared with a study conducted in France among doctors, showed a similar distribution of consumption, with prescriptions for a single therapeutic class estimated at 54%, compared with 32% for dual therapy and 10% for triple therapy [10]. According to the recommendations of the European Society of Cardiology, the use of a single antihypertensive drug is justified in elderly subjects [11]-[13]. The urban population could be extrapolated to that of the Heart Institute, whose patients have an average age of 56, thus justifying the possible use of one drug per therapy [14]. However, in the case of polytherapy, the combination of two molecules seems judicious for controlling blood pressure levels [15] [16]. In the study, when a combination of molecules was used, anti-HTA drugs with two active ingredients were the most widely used. The high use of dual therapies in urban areas would therefore be justified, especially since at the Abidjan Heart Institute, which is the reference center for the management of cardiovascular diseases, this is the type of therapy most prescribed to patients [14]. Previous studies have also highlighted the potential efficacy of antihypertensive polytherapies in controlling blood pressure adequately [17].

Six therapeutic classes of anti-HTA have been identified when a single anti-HTA is used. Diuretics, calcium antagonists and beta-blockers accounted for the largest shares, with the emphasis on furosemide, amlodipine and bisoprolol respectively. Diuretics, beta-blockers and calcium antagonists are effective in lowering blood pressure adequately and significantly reducing cardiovascular risk [18]. With regard to diuretics, in addition to their proven efficacy in lowering blood pressure, their relatively low cost should be noted, which could explain their abundant prescription [19]. Calcium antagonists such as amlodipine have a favourable safety profile in the management of patients with multiple comorbidities, as is the case with hypertension [3].

In terms of drug combinations, calcium antagonists (amlodipine) stood out as being the most suitable for use in combination. In addition, their association with ACE inhibitors (perindopril) and sartans (irbesartan) accounted for more than 50% of the consumption of more than one anti-HTA drug. These two types of combination are frequently used because of their synergistic efficacy in controlling the disease and their protective role on target organs, primarily the heart [4].

In addition, certain demographic characteristics such as patient age or socio-economic status could explain the choice of antihypertensive treatment obtained in this study, especially as the disease affects subjects of advanced age. One study has shown that advanced age is often associated with more cautious prescribing

and greater attention to drug side effects [20]. The major therapeutic classes observed in the study are safer to use. In particular, these are the classes of antihypertensive agents recommended in all types of antihypertensive therapy according to national protocols [21]. The molecules present in combinations of molecules are also considered suitable for initiating and maintaining treatment as part of combined therapeutic regimens for hypertensive patients [14].

It should also be noted that the habits and preferences of doctors, possibly modelled on national recommendations and guidelines, play a crucial role in prescribing decisions [22].

In view of the trends in the consumption of diuretics and calcium antagonists, whether or not associated with converting enzyme inhibitors, it would also be appropriate to maintain the availability of these products and carry out ongoing training and awareness-raising campaigns on their correct use and risk associated with their prescription.

5. Conclusion

In summary, this study reveals a significant prevalence of arterial hypertension in the urban area of Abobo, marked by diversity in the therapeutic classes and molecules used. Despite the wide availability of drugs, combinations of antihypertensive molecules were a priori the most widely used in urban Abobo, with an increase in combinations containing amlodipine. It would be important to optimise therapeutic combinations, highlighting two-molecule combinations as promising strategies for achieving better blood pressure control. Furosemide and amlodipine were the main drugs used as monotherapy. Maintaining their availability would also be necessary for efficient management of the disease in urban areas. The anti-HTA drugs most widely used in urban areas were in fact those recommended as first-line treatment for hypertensive patients.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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