Original Research Article

A Comparative Analysis of Patients' Medicine Prices in a Public Teaching Hospital and Private Retail Community Pharmacy in a Rural Community

ABSTRACT

Background: One-third of the world's population lacks access to essential medicines and price of medicine is considered one of the most important obstacles to access. Improving access to quality medicines and treatment is currently the most important strategy to reduce disability and death from many diseases.

Aim: The objective of this study was to compare the patient prices of medicines in a public teaching hospital and a private retail community pharmacy in a rural community in Nigeria.

Methods: A cross-sectional prospective survey was conducted in a public tertiary hospital pharmacy and private retail community pharmacy in Nigeria. The price was recorded for the list of medicines commonly available in those pharmacies. A total of 30 pharmaceuticals products were selected for data collection. The price was recorded based on the hospital price list and price reported by surrogate customers respectively. Median prices of the two groups were compared with Mann-Whitney test at 95% Confidence interval.

Results: Out of 30 pharmaceutical products selected for survey, only 19 (63.30%) matched pair were recorded. Highest price variation of 80.00% was recorded for metformin 500mg tab, whereas lowest price variation negative of 2.60% was recorded for amoxicillin+clavulanic acid 625mg tab in public pharmacy. The median price of the basket of medicines surveyed did not vary significantly between public pharmacy and private retail community pharmacy ($P > 0.05$).

Conclusion: The patients' medicine prices found in the public hospital and community pharmacy were almost identical. Therefore, the Nigerian government through its ministry of health should play proactive roles to keep the patient prices of medicines much lower in the public hospitals than what is obtained in the private retail community pharmacies.

Keywords: *Medicines, Nigeria, Price Variation, Private Retail Pharmacy, Public Hospital Pharmacy,*

1. INTRODUCTION

One-third of the world's population lacks access to essential medicines; in the poorest parts of Africa and Asia this figure rises to one-half [1]. Medicines account for 20–60% of health spending in developing countries [2-4], and up to 90% of the population in developing countries purchase medicines through out-of-pocket payments [5-8], which has impoverishing effects on the people [9]. This means that access to treatment is much dependent on the availability of affordable medicines. The price of medicine is considered one of the most important obstacles to access [10]. Access to medicines is an important health policy issue. Inefficient or expensive procurement and distribution increases the final price to patient, reducing volume sales and hurting family finances in the largely out-of-pocket payments for medicines.

The expenditure on medicines constitutes a major proportion of healthcare costs in Nigeria despite the fact that one of the objectives of Nigerian national drug policy is to ensure access to safe, effective, affordable and good quality drugs at all levels of healthcare on the basis of health needs [11]. The Nigerian health care system is organized into primary, secondary and tertiary healthcare levels. The Local Government Areas (LGAs) are responsible for primary health care; the State Governments are responsible for providing secondary care while the Federal Government is responsible for policy development, regulation, overall stewardship and providing tertiary care [12]. Nigeria is a middle-income country with ineffective public health system; it is facing a rapid rise in drug costs. Public sector procurement in Nigeria is decentralized [13[, only medication for HIV, malaria and tuberculosis are centrally procured. Most medicines are procured and stored by the individual health care institutions [14].

There are no legal or regulatory provisions affecting pricing of medicines in the country [13]. Medicine prices are determined by free-market economics, without any control by

government. Regulations do not exist mandating that retail medicine price information should be publicly accessible [13].

However, the enjoyment of health is one of the fundamental rights of every human being. Access to essential medicines as part of the fulfillment of the right to health, is recognized in the constitution or national legislation [13]. Therefore, public health facilities are expected to provide medicines free or at low and affordable prices to majority of Nigerians. Improving access to quality treatment is currently the most important strategy to reduce disability and death from many diseases. More generally, ensuring access to effective treatment is a high priority issue for international public health.

Majority of Nigerians live below poverty line of less than 1 USD a day [15]. The national health insurance scheme, which is a viable leeway for people to access health services, still covers only 4% of Nigerian population (only those working for the government and organized private sector) [16]. From the foregoing, it is evident that Nigerian patients are having difficulties accessing the medicines they need and that cost is an important factor due to high out-of-pockets spending on medicines. Therefore, issues concerning prices of medicines are keys to improving access to essential medicines in Nigeria.

Following observations that the cost of medicines has been rising faster than overall consumer prices in a number of countries worldwide, World Health Organization (WHO) and Health Action International (HAI) sponsored a national medicines price survey in 2004 in eight African countries including Nigeria, in order to determine the prices people pay for their medicines [17]. After over a decade, there is a need for situation analysis of prices of medicines at individual healthcare facility level to gain insight into prices people pay for their medicines. Therefore, this study aimed to compare the prices of medicines in a public hospital pharmacy and private retail pharmacy in South Eastern Nigeria. The medicine prices survey

is an effective tool for identifying how patients are charged for medicines and to inform policy interventions relating to medicine pricing.

2. METHODS

2.1 Study Design and Setting

A cross-sectional, prospective study was conducted in the University of Nigeria Teaching Hospital (UNTH) and a private retail community pharmacy within 200m from the front gate of the hospital in Ituku-Ozalla community, Nkanu West of Enugu State, Nigeria in October 2014. UNTH is a 500 bedded reference tertiary health facility in Enugu State, South East Nigeria. It serves over the three million citizens of Enugu State and is a referral centre to the neighbouring South Eastern States of Nigeria.

Figure 1: The Study Area

2.2 Sampling

The tertiary hospital was purposively selected for this study because it is the only specialized hospital in Ituku-Ozalla. One out of the only two community pharmacies that are closest to the hospital at the time of the study was randomly selected by simple balloting.

2.3 Data Collection

A systematic data collection form was developed and pretested at National Health Insurance Scheme pharmacy outlet of the public hospital. A total of 30 pharmaceuticals products were

selected from three drug classes (anti-hypertensives, anti-diabetes, and anti-infectives) for the survey based on the disease burden of the hospital according to an earlier study [18]. The prices of medicines from the hospital pharmacy were collected from the hospital medicine price list, whereas that of the private retail pharmacy was collected by trained surrogate customers by asking the retail person in the pharmacy. Four surrogate customers were recruited to get the accurate retail price of medicines because private pharmacies are reluctant to tell the price of medicines in Nigeria. The unit retail price of the same medicine with the same brand name and the same dose was collected from hospital pharmacy and private pharmacy on the same day.

2.4 Data Analysis

Only the 19 matched pairs of the surveyed medicines available in both hospital pharmacy and retail pharmacy were included in the analysis. The matched pairs of medicines are in the Nigerian essential medicine list [19].

A detailed method for calculating price variation and availability of drugs is described elsewhere [20]. Price variation was expressed as the difference in price of medicines in private retail pharmacy to public pharmacy divided by the price of medicine in public pharmacy (expressed as percentage):

Percentage Price Variation =

$$\frac{\text{Price of medicine in private pharmacy - Price of medicine in public pharmacy}}{\text{Price of medicine in public pharmacy}} \times 100$$

The exchange rate on the first day of data collection was NG₦1.00 = US$ 0.00613

2.5 Statistical Analysis

Microsoft Excel 2007 and SPSS version 21 were used for data entry and analysis. Price variations of 19 medicines common at public hospital pharmacy and private retail pharmacy were calculated. Data was presented as percentage, median, and percentiles. The overall price

of medicines at hospital pharmacy and private retail pharmacy was compared with Mann-Whitney U test at 95% confidence interval (CI).

3. RESULTS

Out of 30 pharmaceutical products selected for survey, only 19 (63.3%) matched pair of them were recorded in both studied hospital and community pharmacy. The price variation in the two locations is shown in the table below. Highest price variation of 80.00% was recorded for Metformin 500mg, whereas lowest price variation negative of 2.60% was recorded for Amoxicillin+Clavulanic acid 625mg tab in public pharmacy. No price variation was found for tablets of Atenolol 50mg, Amlodipine 5mg, Nifedipine 20mg, Frusemide 40mg, Ampiclox+Cloxacillin 500mg, and Metronidazole 400mg. However, prices of Spironolactone 25mg, Methyldapa 250mg, Amoxicillin 500mg, Amoxicillin+Clavulanic acid 625mg, Ciprofloxacin 500mg, and Co-trimoxazole 480mg were higher in public pharmacy compare to private retail pharmacy. It was observed that the median price of the basket of medicines surveyed did not vary significantly in public pharmacy and private retail pharmacy ($P > 0.05$).

Table 1: Variability of the Price of the Same Medicine across Public Hospital and Community Pharmacy

		Public Hospital Unit Price	Community Pharmacy Unit Price	Price Variation
Medicines Generic Names	**Medicines Trade Names**	**NG₦(US$)**	**NG₦(US$)**	**%**
Metformin 500mg tab	Forbetic® by Swipha	5.00(0.03)	9.00(0.06)	80.00
Glibenclamide 5mg tab	Clamids® by Hovid	5.00(0.03)	8.00(0.05)	60.00
Atenolol 50mg tab	Atenolol by Teva	10.00(0.06)	10.00(0.06)	0.00
Amlodipine 5mg tab	Amlovar® by Neimeth	40.00(0.25)	40.00(0.25)	0.00
Nifedipine(Sustained-release) 20mg tab	Medipine® by Evans	10.00(0.06)	10.00(0.06)	0.00
Hydrochlorothiazide50mg+	Normoretic® by Neimeth	6.50(0.04)	9.00(0.06)	38.46

Amiloride 5mg tab				
Frusemide 40mg tab	Renix® by Reals	5.00(0.03)	5.00(0.03)	0.00
Spironolactone 25mg tab	Spirotac® by Hovid	15.00(0.09)	10.00(0.06)	-33.33
Methyldopa 250mg tab	Celodopa® by JB Pharma	10.00(0.06)	9.00(0.06)	-10.00
Lisinopril 5mg tab	Lisinopril by Teva	15.00(0.09)	17.86(0.11)	19.07
Ampicillin + Cloxacillin 500mg cap	Emclox® by Emzor	10.00(0.06)	10.00(0.06)	0.00
Amoxicillin 500mg cap	Moxiten® by Micro Labs	12.00(0.07)	10.00(0.06)	-16.67
Amoxicillin + Clavulanic acid 625mg cap/tab	Amovin® by Evans	110.00(0.67)	107.14(0.66)	-2.60
Cefuroxime 500mg tab	Cefunat® by Evans	135.00(0.83)	142.86(0.88)	5.82
Ciprofloxacin 500mg tab	Cipro-J® by Juhel	20.00(0.12)	17.86(0.11)	-10.70
Co-trimoxazole 480mg tab	Emtrin® by Emzor	3.50(0.02)	3.00(0.02)	-14.29
Doxycycline 100mg cap	Doxycline by Mekophar	8.00(0.05)	10.00(0.06)	25.00
Erythromycin 500mg tab	Erythin® by ACI	15.00(0.09)	25.00(0.15)	66.67
Metronidazole 400mg tab	Loxagyl® by May & Baker	5.00(0.03)	5.00(0.03)	0.00
	MEDIAN	**10(0.06)**	**10(0.06)**	**0.00**
	25TH PERCENTILE	**5.00(0.03)**	**9.00(0.06)**	**80.00**
	75TH PERCENTILE	**15.00(0.09)**	**17.86(0.11)**	**19.07**

4. DISCUSSION

This study revealed no significant variation in prices of medicines in public hospital and private retail community pharmacy in the studied area. It was found that patients' medicine prices in the public hospital pharmacy were almost identical to prices in the private retail pharmacy. This makes one to wonder what the purpose of the public sector pharmacy in offering the most affordable opportunity for accessing medicines for the majority of Nigerians is.

The findings of this study are consistent with the previous studies done in Nigeria and Indonesia [17,21]. In contrast, significant medicine price variation between public hospitals and private pharmacies has been reported in other developing countries such as Nepal, Ghana, Ethiopia, Malaysia, and Peru [22,23-26]. A Plausible reason for the finding of the current study in the tertiary hospital might be due to several causes such as the inefficient procurement methods and excessive mark-ups. Pooling procurement, using open competitive tendering, price information and price negotiations [27], and low mark-up are all well known means of ensuring affordable pricing in the public healthcare facilities. However, in most public health care facilities in Nigeria, procurement is decentralized to the facility level making it impossible for the earlier mentioned strategies to be employed. Another reason may be due to that fact that the hospital studied still run revolving drug funds (DRF) scheme. The DRF managers run the scheme as a purely profit oriented venture. They include mark-ups to prevent depletion of the capital and to ensure provision for depreciation due to inflation [17]. Increases in the prices of medicines result in a decrease in the affordability of medicines. This has led to and continues to lead to negative health outcomes such as patient's dissatisfaction, increased morbidity and mortality arising from the use of and change to different medicines, or to patients forgoing some medicines due to the increased prices [28].

Astronomical drug prices are making expensive medicines inaccessible to patients and in the process may be killing them [29]. Therefore, it is the responsibility of every nation to provide quality and affordable healthcare services to its people. Medicines are a key component of a well functioning health care system. In fact, medicines are one of the most cost-effective elements of modern health care. Provision of medicines at an affordable cost in public hospitals and health centres should be the responsibility of governments of every nation of the world. Provision of subsidized essential drugs to all patients accessing public health facilities, while not costing so much to the government, would bring huge savings to the

patients, and is the easiest and quickest option to reduce out-of-pocket expenses for the poor [30]. Therefore, public hospital pharmacy should serve as a channel through which majority of Nigerians access medicine free or at a subsidized cost in line with national drug policy that requires government to establish necessary mechanisms to guarantee that drug supply to patients cost less than in the private sector [11].

In compliance with the provision of affordable healthcare, some countries of the world are now providing medicines free to its citizens in the public health care facilities, whereas country like China is selling medicines to patients without mark-ups in the public hospitals. Therefore, since health insurance coverage is still very low in Nigeria, Nigerian government should take a cue from these countries in order to reduce financial burdens posed by high cost of medicines for its citizen.

Study Limitations

Health Action International's core drug list was not used because they had few medicines listed for hypertension, and bacterial infections so for studying price variation of such medicines, much detailed listing of commonly used medicines is necessary. This study also differed in calculating the price variation of drugs. Earlier study used the price of the lowest generic drug as reference drug; however, price of surveyed medicines obtained from the public hospital pharmacy was used as the price of reference drug [20]. The results are not generalizable to the whole country, since the research only focused on a small area.

5. CONCLUSION

This study shows that the overall prices patients pay for medicines in the public hospital studied were almost identical to patients' medicine prices in the private retail community pharmacy. This finding has implications for drug accessibility and affordability. Amidst of

increase in morbidity of acute and chronic diseases among general population in recent years in Nigeria, the Nigerian government through the ministry of health should play proactive roles to keep the price of medicines at the affordable price in the public hospitals. To be able to do this, measures should be taken to implement the centralized medicine purchasing system through competitive bidding to make medicine procurement efficient and at the same time, regulate mark-ups. Comprehensive medicine pricing policy should be formulated and enforced. This should include monitoring and regulating medicine prices in the public hospitals.

ETHICAL APPROVAL

The study protocol was approved by the Research and Ethics Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla in South Eastern Nigeria.

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