INTRODUCTION

Pharmaceuticals are a key component of health systems in all countries of the world. They can not afford the protection or recovery of people's health if these products are available, accessible, affordable to these people, but especially if used rationally (Tshakala et al., 2005).

In Africa, particularly the Democratic Republic of Congo (DR. Congo), the lack of availability and accessibility of drugs is a major obstacle to improving the health status of populations and also decreases the quality of care (Tshakala et al., 2005). These include hydroxyurea is an anticancer drug belonging to the anti-metabolites group, in the form of capsules of 500mg manufactured by company Bristol-Myers Squibb Canada under the brand name "Hydrea®". This drug is also used in the treatment of sickle cell disease in children older than 3 years, having at least three vaso-occlusive crisis (VOC) per year or acute chest syndrome (ATS) or anemia severe.
The effectiveness of this treatment will be assessed after a minimum of six months of treatment (Montalember et al., 1997; 2006). Sickle cell disease is a genetic blood disorder, affecting red blood cells, hereditary and transmitted by both parents who are each carriers of a disease gene. This is a serious chronic or life-threatening (median life 50 to 55 years in France, where there are suitable care services), which manifests itself in early childhood (from six months) (Njengwé, 2005; Faure, 2006; Nacoulma et al., 2006). Sickle cell disease is a major public health problem with a high prevalence of the major forms homozygous SS. DR. Congo, subjects homozygous Congolese (SS) are mostly holders of the Bantu haplotype which is a more severe disease expression. 20 to 30% of the population carries the sickle cell trait (AS) and about 2% of newborns have the homozygous (SS) of the disease (Tshilolo and Labie, 2003; Faure, 2006; Tshilolo et al., 2007).

The projections in the country indicate that each year are born in the DR. Congo over 52,000 children homozygous SS, a quarter of new cases recorded in Africa. The main clinical manifestations in childhood include mainly hand-foot syndrome, severe acute anemia, splenic sequestration, painful crises and severe infections (meningitis, pneumonia, osteomyelitis, etc. (Tshilolo et al., 2007). At this risk of serious complications pathology may occur, these include many CVO above 3 per year for at least two years, the STA and anemia severe with lower hemoglobin 7g, requiring the use of hydroxyurea and that under supervision of a specialist (Charache et al., 1995; Bernaudin, 2008; Ngasia et al., 2011). The study conducted at Texas Childrens Center for Global Health, Baylor College of Medicine, in the United States of America (USA) has shown that hydroxyurea is currently the only product approved for the treatment of sickle cell disease because it increases successively total hemoglobin, fetal hemoglobin and mean corpuscular volume and at the same time a decrease in transfusion, painful crises, chest seizures, hospitalizations and pneumococcal infections (Fishbein, 1963; Dover et al., 1986; Charache et al., 1992; Arnaud et al., 2005; Bernaudin et al., 2005; Ngasia et al., 2011). Therefore, the objective of this research is to study the availability and cost of hydroxyurea used in the treatment of sickle cell anemia in Lubumbashi.

MATERIALS AND METHODS

This cross-sectional descriptive study was conducted in 7 towns of Lubumbashi, Haut-Katanga Province in DR. Congo, specifically in 140 pharmacies and 20 wholesale facilities (EVG) for the period from 1 October to 30 November 2016, starting from the research sheet given by the Faculty of Pharmaceutical Sciences of the University of Lubumbashi. The managers of these entities were asked to answer questions about the knowledge of hydroxyurea, availability and cost. Among the information that concerned them, we noted the name, gender and education level. The collected parameters were noted in a research registry and entered on computer and analyzed using Microsoft Excel 2013 for the calculation of the mean and standard deviation.

RESULTS

Distribution of officials and pharmacies EVG sex: Female gender was dominant with a staff of 90 cases or 56.25%, of which the sex ratio is 1.28. This study showed no female presence in EVG (Table I).

Distribution of officials and pharmacies according EVG Public and level of education: It is clear from this research that over 160 heads of EVG and pharmacies, 62 cases or 38.75% were pharmacists, including 40 located in the town of Lubumbashi, in precisely 20 EVG and 20 pharmacies. As for non-pharmacists, they represent 98 cases or 61.25%, including nurses (21.87%), unskilled tenants (19.37%), graduates of state (18.75%) and doctors (1, 25%), divided into the remaining common (Table II).

Distribution of officials and pharmacies according EVG Public and knowledge of hydroxyurea: It appears from these results that 93 or 58.12% of managers and pharmacies EVG ignored the drug hydroxyurea and all left in the six communes except that of Lubumbashi. (Table III).

Distribution of hydroxyurea as municipalities, the availability and cost in pharmacies: Of the 140 surveyed pharmacies, 14 or 10% disponibilitaient hydroxyurea at an average cost of 14535 ± 3371.05 Congolese Francs (FC) equal to 14,83 ± 3.44 US dollars (US $) for the box of 20 capsules dosed at 500mg and these pharmacies were located only in the town of Lubumbashi (Table IV).

Distribution of hydroxyurea as municipalities, the availability and cost in the EVG: The data showed that the EVG existed only in the common Lubumbashi and 20 EVG surveyed, 10 or 50% disponibilisaient hydroxyurea at an average cost of 11063 ± 3190.60 ± 11.29 FC equal to 3, US $ 26 for 20 capsules box dosed at 500mg (Table V).

DISCUSSION

The discussion of the results of this study focuses on the following: the distribution of EVG makers and pharmacies by sex, level of education, knowledge of hydroxyurea and distribution of the drug according to the Commons, availability and cost to the entities mentioned above. Distribution of officials by gender: Table I shows that of 160 cases is 100% responsible for EVG and pharmacies, 90 cases or 56.25% were female and all were in pharmacies and not in the EVG. This feminine frequency in pharmacies (Dispensaries) was also found in a study conducted in France by gender and type of contract of pharmacists working in pharmacies. 75% of these pharmacists were women and 25% men. The only difference is that all these women are pharmacists, unlike those of Lubumbashi (https://fr.statista.com/ statistiques/ 514434/ repartition-pharmaciens- etablissements-sante-sexe-contrat- france/). According to the educational level, Table II shows that 98 officials (61.25%) pharmacies were not pharmacists but nurses (21.87%), tenants without any education level (19.37%), status graduates (18.75%) and doctors (1.25%). The frequency of non-pharmacists in pharmacies render certain drugs including hydroxyurea virtually unavailable through ignorance, while the pharmaceutical legislation of DR. Congo and Morocco say that no one can manage a pharmacy he owns the pharmacy diploma or degree required for an equivalent (Schedule to the Ordinance-Law No. 91-018 of 30 May 1991; Van den Brink, 2003; Nhaili, 2014) Regarding the knowledge of hydroxyurea makers EVG and pharmacies as municipalities, the results show that 93 officials is 58.12% did not know the drug.
This frequency of ignorance was represented by non-pharmacists by reference to Table II returned as the Public and level of education. Concerning the availability and cost of Hydroxyurea in Pharmacies, Table IV shows that said the drug was virtually unavailable as 140 pharmacies surveyed, 14 or 10% only disponibilisaient and all these pharmacies were in the town Lubumbashi. This virtual unavailability is linked to ignorance of this product by non-pharmacists who managed the majority of pharmacies and the location of the latter in the town of Lubumbashi could be justified by the fact that it is the most urbanized and abounds center of the city of Lubumbashi, the second city after the Kinshasa DR, Congo (Yannick et al., 2014; //fr.wikipedia.org/w/index.php?title=Lubumbashi andoldid=145236036).
As for the average cost of the medication amounts to 14535 ± 3371.05 FC equivalent to 14.83 ± US $ 3.44 for a box of 20 capsules of 500mg, it seems high for parents of affected children by lack of funds, as this treatment is long-term (at least six months), compared to R and D. Congo is today, despite its immense natural wealth, classified among the poorest countries in the world whose population is too déminue to afford medical care or buy medicine. The gross domestic product (GDP) per capita is US $ 394.25 / year, or 32.8 US $ / month or US $ 1 / day. 87.7% of Congolese live below the poverty line (Wembonyama et al., 2007; https://www.google.com/search).

The availability and cost of hydroxyurea in EVG as shown in Table V, show that of the 20 EVG respondents, 10 or 50% disponibilisaient this drug at an average cost de11063 3190.60 ± 11.29 ± equal FC US $ 3.26 and all these EVG are located in the town of Lubumbashi. Referring to Article 48 talking profit margins of pharmaceutical products set by the Ministry of R and D in the economy. Congo, which are 20% for EVG and 33% for pharmacies, we say that the retailer price or price of hydroxyurea in pharmacies respects the margin, but still seems high to those concerned for the reasons mentioned above above (Wembonyama et al., 2007; https:// www.leganet.cd/Législation/Droit%20 Economic / Regulatory Products / AM.1250. 008. 28.09. 2015.html).

Conclusion

Ignorance of hydroxyurea, a drug used in the treatment of sickle cell anemia in Lubumbashi by most people other than pharmacists who manage the majority of pharmacies, makes it virtually unavailable product and its cost appears high by to the financial resources of parents with sickle cell disease. The initiation of a national program and management of sickle cell disease by the Congolese government, as is the case for malaria, tuberculosis and HIV / AIDS is essential to help sickle cell.

Author Contributions

Bushiri Furaha Mathilde: Contributed to the collection of data and writing of the manuscript.

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Bushiri Mitamba Jolie: Contributed to the drafting of Article

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Kodondi Kule-koto Fridolin: contributed to the validation protocol and coordination of the study

Conflicts of interest: None

REFERENCES


DRC is a poor country according to the IMF https:// www. google.com/search accessed February 27, 2018.


Schedule to the Ordinance-Law No. 91-018 of 30 May 1991 Determining the pharmaceutical code of ethics DR. Congo, Article 11, p13.


