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Knowledges, Attitudes and Practices of Household Heads on Malaria in Urban and Rural Areas of Kribi, South-Cameroon

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Abstract

The objective of this survey was to evaluate the knowledge, attitudes and practices the head of household had concerning malaria in the urban and rural zones of Kribi. The survey was conducted from 17 – 27 June 2019 in 3 and 5 quarters respectively in the urban and rural areas of Kribi by means of a standard questionnaire given to the household heads. 540 household heads aged from 18 to 70 years enjoying at least 2 years seniority in the surveyed quarters were interviewed. The interviewees associated the malaria to a mosquito bite in 88.5% cases (n=208) in the urban areas against 82.6% cases (n=255) in the rural areas. They showed up at the health facility in case of malaria suspicion in 69.8% and 67.7% cases in the rural and urban areas respectively. The remaining population resorted to street medications, traditional medicines and self-prescription. The interviewee's monthly financial coverage for self-treatment was of 11.31 € (rural area) against 9.84 € (urban area). Treated mosquito nets was the most used prevention tool in the survey area (81.31%; n=248 and 89.49%; n=210). Other prevention means were environmental sanitation, coils and fumigation. The level of the population's awareness regarding malaria seems fair enough. Nevertheless, the authorities should improve it *via* consciousness-raising campaigns.

Keywords: Attitudes; Knowledge; Kribi; Practices; Malaria

Introduction

Malaria, in its scale and severity, is one of the world's greatest public health challenges, despite the efforts made in recent decades by countries, where disease is endemic, and development partners. Data show that about 3.2 billion people are exposed to the disease annually. In 2017, World Health Organization (WHO) reported 219 million of people, 445,000 of whom died [1-3]. Africa remains the most affected continent with about 93% of cases recorded compared to 5% in Southeast Asia and 2% in the Mediterranean region [2]. In Cameroon, malaria population represents ca. 43% of the total population, with children and pregnant women being the most affected [4].In recent decades, Cameroon deployed various means to fight against malaria, including free care for children aged 3 to 59 months, free insecticide-impregnated mosquito nets (MIIs), Intra-house insecticide spraying, Intermittent Preventive Treatment (ICT) for pregnant women and Chemo-Prevention of Seasonal Malaria (CPS) [5,6]. Despite this arsenal of measures, malaria remains a real public health problem in Cameroon [7,8]. The main reasons regularly pointed out by many authors to explain this situation are usually an approximate and less relevant application of the curative and preventive measures and the resistance of germs and vectors: anti-malaria and insecticides, respectively [2]. Very little work adds to these reasons, the relationship that people have with the disease. These reports concern the level of knowledge of malaria by populations, the attitudes adopted by them from the first symptoms of the disease and the practices of populations to avoid vector bites exposition. However, these data are fundamental to the design and monitoring of malaria control programmes in the field [2]. In Cameroon, population awareness campaigns for certain diseases are not regular. The few campaigns taking place hardly affect the most disadvantaged populations because of the country's coverage of communications (radio, internet, newspaper and television) which is still considered limited. This leads to heterogeneous region coverage in terms of knowledge of malaria. Work such as these is justified in that it identifies communities in the country that are less-informed about malaria in order to enable government to take appropriate measures to reduce the gap.The region of South Cameroon, endemic to malaria, is among those that do not yet have data on the relationship between populations and malaria.

This survey is part of a logic of assessing the level of knowledge, attitudes and practices regarding malaria treatment and prevention in the peri-urban and urban areas of Kribi, South-Cameroon.

Materials and Methods

Study areas

The study took place in the Ocean division, one of the fourth divisions of the region of south Cameroon. The Ocean division covers an area of 11,280 km^2, with an estimated population of more than 133,062 inhabitants [9]. The climate is a humid tropical one, equatorial in type, with four well-marked seasons: a great rainy season (September - November); a great dry season (December-March); a small rainy season (April-May) and a small dry season (June - August)

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Table 1: Characteristics, knowledge and control level of the vector and malaria treatment of household heads interviewed in two areas of the Ocean Department.

Categories	Characteristics	Rural area	Urban area	Two boroughs
Households	N. interviewed	305	235	540
	N.households/neighborhood	76	78	77
	N. total of persons in households	1750 (56.58%)	1343 (43.42%)	3093 (100%)
	N. total of men	84 (48.55 %)	89 (51.45 %)	173 (100%)
	N. total women	218 (61.24 %	138 (38.76%)	356 (100 %)
	N. total pregnant women	3 (27,27 %)	8 (72,73 %)	11 (100 %)
	Avg. person / household	5,74 ± 0,21	5,71 ± 0,20	5,72 ± 0,14
	N. children (-5 years old)	312 (53,33%)	273 (46,67%)	585 (100%)
Causes of malaria	Mosquito bites	255 (82,6%)	208 (88,5%)	463(85,74%)
	Others (rain, dirty water)	50 (17,4%)	27 (11,5)	77 (14,26%)
Prevention	No ways of protection	57 (18,69%)	25 (10,6%)	82 (15,18%)
	Household having at least one mosquito net	248 (81,31%)	210 (89,40%)	458(84,81%)
	Mosquito nets in good condition	243 (79,67 %)	179 (76,17 %)	422(77,92 %)
	Spray / coil usage	65 (21,30%)	90 (38,32 %)	155 (28,70%)
	Smoke use	5 (1,60%)	1 (0,42 %)	6 (1,1%)
	Sanitary environment	109 (46,4%)	94 (40 %)	203 (43,2%)
Origin of mosquito nets	Free Acquisition	208 (68,2 %)	185 (78,7%)	393(72,78 %)
	Purchase	34 (11,1%)	22 (9,4%)	56 (10,37%)
	Purchase/acquisition	03 (1%)	3 (1,3%)	6 (1,11%)
	No mosquito nets	40 (13,11 %)	15 (6,38%)	55 (10,18%)
Expenditure (FCFA)	Annual treatment of malaria	135 € ± 1,13 € (11,31€ /mois)	118 € ± 0,9 € (9,84 €/mois)	126 € ± 0,97 €(10,57 €/mois)

N= Number; Avg= means

[26]. Temperatures range between 27 and 37 degrees Celsius and the average annual rainfall is in the order of 2797-2900mm. Malaria is endemic to seasonal resurgence. The survey took place specifically in rural and urban areas. The rural area covers an area of 332 km^2. The population consisting mainly of Batanga, Mabi and Yassa is estimated at 22,681 inhabitants [8]. Five sites were targeted by our survey: Mokolo, Mpangou, Mboa-manga, Talla and Petit Paris. Houses are made of either temporary or permanent materials. The urban area covers an area of 125 km^2. The population consisting mainly of Fans, Batanga, Mabi and allogenesis estimated at 40,000 inhabitants [8]. Three neighbourhoods were targeted by our investigation: Dombè, Afan-mabé and Djanfi. Houses are modern in general.

Gathering information

This cross-sectional observation study took place from June 17 to 27, 2019. All heads of households who had been permanently resident in the study areas for at least two years were admitted to participate in the study. The itinerary method was used to select concessions [9]. The number of households selected for the study by neighbourhood was proportional to the size of the study (cumulative workforce method). The sample size of the heads of households, calculated with the formula n = σ x ε (α = 0,05) 2 x p (1-p)/ i2, was estimated at 540. (For an i=0.05 accuracy, a risk of error =0.05, probability p =0.848, and a cluster effect of 5 and 3, respectively, in rural and urban areas). The data were collected using a standard fact sheet of about 15 questions submitted to heads of households, after free and informed consent. The variables collected were related to the socio-economic and demographic characteristics of households; Knowledge of the symptoms of malaria; Attitudes and practices in the event of a fever whether or not Insecticide-Treated Nets (ITNs) and other protective measures (the use of natural species, bark, etc.) are used. etc.); the theoretical chemical quality of impregnation and the determinants of IBD use. Batanga (the majority local language of the Ocean Department) commonly spoken by the population, was used for the survey in addition to French and English.

The data was captured and analyzed using the Excel computer tool with the SPSS Statistics version 23 software. Frequencies and averages were compared using the Mann-Whitney Test 2, or the U test, depending on the applicability conditions. The confidence interval was 95% (α = 0,05).

Results

Socio-demographic characteristics

A total of 540 households, including 305 in rural areas and 235 in urban areas, participated in the study, representing a participation rate of 93%. The average person per household was 5,71±0,2 in urban areas and 5,74±0,21 in rural areas. Of all the women surveyed, 27.27% in rural areas (n=3) were pregnant compared to 72.72% in urban areas (n=8). In addition, of all children under the age of 5 registered in the study areas, 53.33% (n=312) were registered in rural areas compared to 46.67% (n=273) in urban areas (Table 1).

General knowledge of malaria and its vector

A total of 82.6% of respondents in peri-urban areas and 88.5% in urban areas knew how malaria is transmitted. Other factors

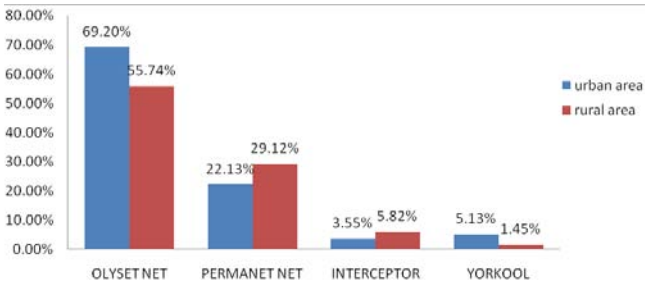

Figure 1: comparison of proportion of use of mosquito networks in a peri-urban and rural area.

such as dirt, rain, dirty water were considered to be responsible for malaria by 17.4% of respondents in the peri-urban area and 11.5% of respondents from the urban area. The most evocative signs of simple malaria according to the respondents were fever, headache and chills. 166 respondents attributed the lack of attendance in health facilities in the event of a malaria crisis to the high cost of prescriptions.

In terms of prevention, a total of 82 households out of the 540 surveyed did not use any means of mosquito protection. The number of households that did not use any means of prevention was significantly higher in rural areas (n=57) than in urban areas (n=25) (p=0.004). Coils and mosquito nets were regularly cited prevention tools in 29.81% and 85.35% of cases respectively. Pregnant women slept under an impregnated net at the time of the survey in 100% of cases (n=3) in rural areas compared to 75% of cases (n=6) in urban areas; while 33.01% of children under the age of 5 (n=103) slept under a mosquito net in rural areas compared to 72.53% of children in this urban age group (n=198) (Table 1). The difference between children under 5 years of age sleeping under a mosquito net is significant between the two sites (p=0.003). In addition, a total of 77.92% of households (n=422) had at least one net in good condition. This rate was 79.67% (n=243) in rural areas and 76.17% (n=179) in urban areas (Table 1). Of all the brands of nets, the Olyset Net brand (n=175) was the most used in both rural and urban areas (Figure 1). Of the 458 households using at least one net (Table 1), 68.2% of rural respondents (n=208) and 78.7% of urban respondents (n=185) reported having acquired them during LLINs free distribution campaign organized in the same year (PNLP, 2019).

Financial cost associated with vector control and malaria treatment

Spending on malaria treatment was particularly high among rural household heads (Table 1). In this area, respondents reported spending up to 25% of monthly income depending on the severity of health status (Table 1). On average, the amount spent per year by heads of households was 135 euros (€ 11.31/month) in rural areas compared to 118 euros (€ 9.84/month) in urban areas for vector control and malaria management.

Managing malaria cases in households

A total of 215 surveys in peri-urban areas and 159 surveyed in urban areas reported going to a health structure in the event of a malaria crisis (Table 2). The remaining segment of respondents said they used to buy medicines in pharmacies without a prescription (in 11.15% of cases in rural areas compared to 16.17% of cases in urban areas), to the purchase of street medicines (in 16.60% of cases in rural areas compared to 24.70% of (in 9.50% of cases in rural areas compared to 4.70% in urban areas) (Table 2).

Table 2: Home management of malaria cases by heads of households in suburban and urban areas.

Characteristics	Rural area	Urban area	Two boroughs
N. respondents	305	235	540
Cases of fever / year	1343 (4.40±0.27)	1144 (4.82±0.27)	2487 (4.62±0.20)
Cons. Hospital	215 (69.8%)	159 (67.7%)	374 (68.75%)
Pharmacy	34 (11.15%)	38 (16.17%)	72 (13.66%)
Med. Street	39 (16.60%)	58 (24.70%)	97 (20.65%)
Pharmacy & Med. Street	10 (3.27%)	11 (4.68%)	21 (3.97%)
Rem. Trad.	29 (9.50%)	11 (4.70%)	40 (7.1%)
Pharmacy & Rem. Trad	. 19 (6.23%)	12 (5.10%)	31 (5.74%)

Rem.Trad = traditional remedies; **cons.hospital =** hospital consultation**; Med. Street =** street drugs

Discussion

The recorded results show a high rate of study participants (93%). This massive adherence to this survey shows the willingness of the respondents to cooperate for a lasting solution to this scourge. The survey also found that the average number of people per household was similar in the study areas. This result contrasts with that found by Offono (in press.) in a similar study conducted in West Cameroon. In this part of the country, the average number of persons per household was significantly high in Bafang (urban) compared to Bakassa (rural location). The rural exodus of young people looking for work was the explanation which enabled him to justify this situation. The result obtained in our survey could be justified by the proximity existing between our 2 study locations.

It also appears in our survey that the population studied had a good knowledge of the mode of transmission of malaria. These results are consistent with those obtained in Senegal by Ndour et al. (2006) [10] and in Rwanda by Hutton et al, [11]. According to those reports, it emerged that 85% of Senegalese respondents and 78% of Rwandan respondents attributed the transmission of malaria to mosquito bites. The present survey also revealed that, among prevention tools, mosquito net was the most used in both suburban and urban areas. This important use may be due to the good level of knowledge of the usefulness of the ITNs of the populations surveyed. This result contrasts with that found by Yandaï et al. (2016) [6]. The latter showed that rural populations used ITNs less than urban populations. It is important to note that in Africa, most rural areas are not covered by an electricity network and therefore cannot benefit from awareness campaigns through the media (radio, television, etc.) initiated by the malaria control programs. Moreover, some studies have reported that some rural populations use ITNs for other purposes (fishing, agriculture) [10,12]. In this context, it is easy to understand the low use of this prevention tool in rural areas. The rural community surveyed is one of the few in Cameroon fully covered by the electricity grid and also benefiting from satisfactory road infrastructure. These two elements are sufficient for malaria-related information to reach the target populations. In addition, it is noted with satisfaction that the rate of bed nets used in the two study areas is higher than that recommended by WHO. If the information

provided by the respondents proves to be accurate, this high use of ITN could significantly decrease the density of vectors and therefore the transmission of malaria in the medium or long term, as observed in other localities [13,14].

In addition, there is a high proportion of pregnant women sleeping under a mosquito net in both urban and rural areas. This result is significant when we consider that pregnant women (decreased immunity) as well as children under 5 years of age (non-acquired immunity) constitute the slices of the populations most vulnerable to malaria [15]. Thus, constructive recommendations should be made for rural heads of households where only less than half of the children aged 0 to 5 slept under a net. Olyset Net was the mosquito net brand most used by the populations in the study areas, at the expense of the Permanet Net, Interceptor and Yorkool brands. Some studies have shown that the Permanet Net brand was by far the strongest because it had a low average of hole index than the OlysetNet brand after 2 years of use [16,17]. This result seems to be the consequence of the nature of the fibers with which these nets are made. In fact, the polyester fibers used in the manufacture of Permanet mosquito nets might be better in quality compared to the polyethylene fibers used in the manufacture of Olyset mosquito nets. In the light of the results of these studies, it would be strongly recommended to the populations of the study areas the use of Permanetbrand nets, if it was up to them to make a choice. In addition, it indicates that Kribi household heads spent nearly 25% of their monthly income on malaria prevention and treatment. This expenditure seems to be exorbitant compared to that found during the surveys conducted in Yaoundé and Douala [18-20]. This difference is due to the prevalence of malaria, which is much higher in rural towns than in large metropolises. In fact, the urbanization of large African cities significantly reduces Anopheles breeding sites while favoring the settlement of Aedes breeding sites [20].

The higher cost of malaria treatment in the Kribi towncould also be due to the non-applicability of the governmental measure to make the management of uncomplicated malaria in children free of charge. Up to this date, we realize indignantly that this measure is only applied in major cities such as Douala and Yaounde.

A fairly large number of study populations use street drugs and traditional medicine to treat malaria. This reluctance of the population to go straight to accredited health facilities is related to the high cost of malaria cares in those health centres, which does not afford populations to easily pay consulting fees. A similar analysis was done by Ndo et al. (2011) [20] in a similar study conducted in Douala and Yaoundé. However, by deciding to turn to street drugs, these populations incur enormous risks of intoxication. Indeed, street drugs are of dubious origin, they are then poorly preserved and thus become poison for the organism [19,21]. Studies in Cameroon have shown that poorly preserved antimalarials can cause convulsions, coma, cardiac arrest or respiratory failure, and lead to death (Minsanté, 2018). Moreover, when the drugs are uncorrectly dosed, plasmodiums develop resistance to antimalarials [22,23]. In the light of the above, awareness-raising campaigns deserve to be carried out in the study areas to discourage local populations from such practices. In addition, although effecient and less toxic to the body, traditional medicine needs to be improved and rationalized in order to define the doses to prescribe. Very often, cases of overdose are noted and can be fatal for the patient [23]. Numerous studies have shown cases of hepatic and renal failure following traditional drug use [24,25]. Therefore, populations in study areas should be advised to take traditional medicines with great caution.

Conclusion

The survey conducted in urban and rural areas of Kribi showed that the respondents had a good knowledge of the mode of transmission and prevention of malaria, and a good reflex to be treated in case of illness. However, a significant portion of the population uses irrational health care that can lead to fatality for the patient. Appropriate control measures need to be taken by the government to limit the current expansion of illegal drugs in order to guarantee an excellent health service to the population.

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Authors Contributions

LSEN: General Supervision and Final Proofreading of Manuscript; PNA: General Coordination, Revision of Manuscript; RSM: Design of the Study, Interpretation of Data, Statistical Analyzes and Writing of the Manuscript; OENHGTMNTNLMEORNBM: Collected the Data. All Authors have Revisedand Approved the Manuscript.

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