

ORIGINAL

Malaria behavior in adult patients. Cacolo Municipal Hospital, Lunda Sul, Angola

Comportamiento de la malaria en pacientes adultos. Hospital Municipal De Cacolo, Lunda Sul, Angola

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ABSTRACT

Malaria is a disease caused by a Plasmodium parasite, transmitted by the bite of an infected mosquito. With the objective of determining the behavior of malaria from January 2020 to December 2021 in the municipality of Cacolo, Lunda Sul, Angola, a cross-sectional descriptive observational study was carried out. The universe was made up of 26 252 patients and the sample was made up of 11 506 patients, having the approval of the institution and consent to carry out this work. The female sex predominated with 63,0 % and the age group of 15-19 years with 14,1 %; 98,4 % of the patients reported fever; 96,5 % were uncomplicated cases of malaria; the most used drug combination was Artemether/Lumefantrine (52,6 %); 16,3 % of pregnant women had at least one episode of malaria; complications predominated in the female sex 57,8 %; the most frequent complication was cerebral malaria with 48,8 % and there were 0,3 % deaths.

Keywords: Malaria; Plasmodium; Uncomplicated Malaria.

RESUMEN

El paludismo o malaria es una enfermedad causada por un parásito Plasmodium, transmitido por la picadura de un mosquito infectado. Con el objetivo de determinar el comportamiento de la malaria de enero del 2020 a diciembre del 2021 en el municipio de Cacolo, Lunda Sul, Angola, se realizó un estudio observacional descriptivo de corte transversal. El universo estuvo conformado por 26 252 pacientes y la muestra quedó constituida por 11 506 pacientes, teniendo la aprobación de la institución y el consentimiento para la realización de este trabajo. Predominó el sexo femenino con un 63,0 % y el grupo etario de 15-19 años con un 14,1 %; el 98,4 % de los pacientes refirió fiebre; el 96,5 % fueron casos de malaria no complicada; la combinación medicamentosa más utilizada fue Artemeter/Lumefantrina (52,6 %); un 16,3 % de las embarazadas tuvo al menos un episodio de malaria; predominaron las complicaciones en el sexo femenino para un 57,8 %; la complicación más frecuente fue la malaria cerebral con 48,8 % y hubo un 0,3 % de fallecidos.

Palabras clave: Paludismo; Plasmodium; Malaria no Complicada.

INTRODUCTION

Malaria is a disease caused by a *Plasmodium* parasite, transmitted by an infected mosquito's bite. Only the *Anopheles* genus of mosquitoes transmits malaria, which causes fever, headache, chills, and vomiting, among other symptoms. It affected 214 million people worldwide and, according to the United Nations (UN), caused 438,000 deaths in 2015.⁽¹⁾

Currently, this deadly disease caused by a mosquito bite mainly affects sub-Saharan Africa, where 72 % of cases and 88 % of deaths from malaria have been reported in the last three years. More than 500 million people become seriously ill, and more than 1 million die each year. It causes 20 % of child deaths in Africa (every 30 seconds), and an African child experiences an average of 1,6 to 5,4 episodes of malaria fever per year.⁽¹⁾

Malaria is one of the most serious health problems in the world. It causes 300 to 500 million clinical cases per year, with 40-60 % of the world's population at risk. According to data from the World Health Organization (WHO), an estimated 219 million cases of malaria occurred worldwide in 2017 (95 % confidence interval [CI]: 203-262 million), compared to 239 million cases in 2010 (95 % CI: 219-285 million) and 217 million cases in 2016 (95 % CI: 200-259 million). Most malaria cases in 2017 were in the African Region (200 million or 92 %), followed by the South-East Asia Region (5 %) and the Eastern Mediterranean Region (2 %). Fifteen countries in sub-Saharan Africa and India bore nearly 80 % of the global malaria burden. Five countries accounted for almost half of all malaria cases worldwide: Nigeria (25 %), Democratic Republic of the Congo (11 %), Mozambique (5 %), India (4 %), and Uganda (4 %).⁽²⁾

In recent years, Africa has been at the forefront of global malaria incidence, with an estimated 247 million confirmed cases, accounting for 95 % of confirmed cases and 96 % of deaths worldwide. At the World Health Assembly in 2015, an unprecedented milestone was achieved in global malaria control through Resolution WHA68.2, which established the Global Technical Strategy for Malaria 2016-2030.⁽³⁾ Recent studies suggest using high, supervised doses of primaquine at 7 mg/kg/day for 14 days to reduce malaria relapses caused by *P. vivax* and *P. falciparum*.^(4,5)

Considering the health situation in Angola and the lack of studies that could help minimize the risk and occurrence of the disease, we are motivated to carry out this work to determine the behavior of malaria in patients aged 15 to 89 in the municipality of Cacolo, Lunda Sul province in the People's Republic of Angola from January 2020 to December 2021 so that it may help improve the health status of the population.

METHOD

A descriptive cross-sectional observational study was conducted to determine the behavior of malaria from January 2020 to December 2021 in the municipality of Cacolo, Lunda Sul, Angola. The universe consisted of 26,252 patients diagnosed with malaria, with the sample comprising 11,506 patients aged between 15 and 89 years. The variables used were age, sex, symptoms, classification, drug combinations, complications, and deaths. Data were collected from monthly statistical reports, taking into account the laboratory results recorded in the consultation logbook. The information obtained was stored in a database for organization, processing, and subsequent analysis of the results, with prior approval from the institution and its consent to carry out this work, guaranteeing the most relevant ethical aspects for research of this type and stating that all information obtained would be used solely for scientific purposes, in aggregate form and without reference to individuals or families, so as not to violate the principles of confidentiality.

RESULTS

There was a predominance of females with 63,0 % and of the 15-19 age group with 14,1 %, followed by the 20-24 age group with 12,5 % (table 1).

Table 1. Dates						
Age	Sex					
	M	%	F	%	Total	%
15 - 19	656	5,7	977	8,4	1633	14,1
20 - 24	578	5,0	864	7,5	1442	12,5
25 - 29	391	3,3	771	6,7	1162	10,0
30 - 34	396	3,4	682	5,9	1078	9,3
35 - 39	324	2,8	791	6,8	1115	9,6
40 - 44	421	3,6	749	6,5	1170	10,1
45 - 49	287	2,4	591	5,1	878	7,6
50 - 54	306	2,6	557	4,8	863	7,5

55 - 59	298	2,5	382	3,3	680	5,9
60 - 64	178	1,5	319	3,0	497	4,3
65 - 69	108	1,0	166	1,4	274	2,3
70 - 74	187	1,6	114	1,0	301	2,6
75 - 79	93	1,0	101	1,0	194	1,6
80 - 84	58	0,5	68	0,5	126	1,0
85 - 89	42	0,3	51	0,4	93	0,8
Total	4323	37,0	7183	63,0	11 506	100

Regarding the most common signs and symptoms, 98,4 % of patients reported fever, 91,8 % reported headache, 86,5 % reported chills, and 85,0 % reported abdominal pain (table 1).

Table 2. Most common symptoms and signs of the disease

Symptoms and signs	Total	%
Headache	10 563	91,8
Fever	11 322	98,4
Abdominal pain	9786	85,0
Chills	9964	86,5
Weakness	6014	52,2
General discomfort	8932	77,6
Neck pain	7989	69,4
Cough	8221	71,4
Joint and muscle pain	9314	80,9
Diarrhea	5863	50,9
Nausea and/or vomiting	4931	42,8
Lower back pain	8963	77,8

96,5 % were cases of uncomplicated malaria and only 3,4 % were complicated malaria, with a predominance of females with 7,183 cases, representing 62,4 % (table 3).

Table 3. Type of malaria according to classification as complicated or uncomplicated

Malaria	M	%	F	%	Total	%
Uncomplicated	4,159	36,1	6,955	60,4	11,114	96,5
Complicated	164	1,4	228	2,0	392	3,4
Total	4323	37,5	7,183	62,4	11,506	100

The most commonly used drug combination was artemeter/lumefantrine (20/120 mg) with 52,6 %, followed by artemeter (80 mg) with 18,6 % and, in third place, artemisanate/amodiaquine (100/270 mg) with 16,7 % (table 4).

Table 4. Most commonly used drug combinations

Medicines	Total	%
Artemether/Lumefantrine (20/120 mg) Tablets	6,059	52,6
Artusanato/Amodioquina (100/270 mg) Tablets	1,924	16,7
Artemeter (80 mg) Ampoules	2,142	18,6
Artesum (60 mg) Bulbs	398	3,4
Quinine (300/400 mg) Tablets	983	8,5
Total	11,506	100

Of 5,916 pregnancies, 969 (16,3 %) had at least one episode of malaria (table 5).

Table 5. Malaria behavior in pregnant women

Total number of pregnant women	Pregnant women with malaria	%
5,916	969	16,3

Complications were more prevalent in females, with 228 cases (57,8 %). The most common complication was cerebral malaria, with 48,8 %, followed by acute anemia, with 17,3 %, and seizures, with 16,8 %. There were 41 deaths, representing 0,3 % of cases, with females predominating at 61,0 % (table 6).

Table 6. Most common complications and deaths from the disease

Complications	M	%	F	%	Total	%
Cerebral malaria	87	22,1	105	26,7	192	48,8
Seizures	27	6,8	39	9,9	66	16,8
Acute anemia	21	5,3	47	11,9	68	17,3
Acute renal failure	2	0,5	4	1,0	6	1,5
Respiratory distress	8	2,0	13	3,3	21	5,3
Acute pulmonary edema	2	0,5	1	0,2	3	0,7
Hypoglycemia	11	2,8	15	3,8	26	6,6
Disseminated Intravascular Coagulation	6	1,5	4	1,0	10	2,5
Total	164	41,2	228	57,8	392	100
Deaths from the disease	16	39,0	25	61,0	41	100

DISCUSSION

Although malaria can affect both sexes, this study showed a predominance of females. The authors believe this is because more women in the municipality carry out agricultural work and are more exposed to mosquitoes. These results are similar to those found by Restrepo in 2019, which showed a higher infection rate in females at 66,8 %.⁽⁶⁾ They are also similar to a study conducted in Benguela, where of 1,535 diagnosed cases, 937 were women, representing 61 %.⁽⁷⁾

Regarding age, the results are consistent with research conducted in 2020 in the department of Nariño by Galindo et al., where the age group most affected by the infection was 15-19 years.⁽⁹⁾

The most frequently reported symptoms were fever, headache, chills, and abdominal pain. Other literature reports similar results, highlighting fever as the most relevant symptom, such as the study conducted in the Department of Córdoba, Colombia, in 2015 by Knudson-Ospina et al., where they describe fever as the most frequent symptom in 99,1 % of the patients studied.⁽⁹⁾

According to the classification of malaria, with uncomplicated malaria predominating, the authors believe that this is due to early patient attendance at consultations, with timely diagnosis and treatment, in conjunction with the presence of the *Plasmodium falciparum* and *vivax* parasites, which are less lethal and more common. No studies were found related to the behavior of these variants; however, some authors note that in cases of uncomplicated malaria, symptoms begin to subside quickly after the start of antimalarial treatment.⁽¹⁰⁾

Drug combination therapy is the use of two or more drugs to treat a condition, which may be necessary to increase the effectiveness of treatment, reduce side effects, and improve the patient's quality of life. The combination used in this research is similar to that used in the metacentric study conducted in Africa, which showed that the adequate clinical and parasitological response was 95,5 % with artemether/lumefantrine, while in Nigeria, cure rates of 100 % were observed with the same drug, data obtained with polymerase chain reaction (PCR) tests.⁽¹¹⁾

Malaria during pregnancy is a health problem to be taken into account as it increases the risk of serious illness, anemia, and even maternal and fetal death. In the municipality of Cacolo, there is a program that protects and benefits pregnant women through multidisciplinary management, pregnancy counseling, and mosquito nets to minimize or prevent the onset of the disease, hence the low percentage of pregnant women with malaria in this study. This result differs from some studies conducted in Colombia over the last fifteen years, which have studied malaria associated with pregnancy in the Urabá Antioqueño and San Jorge areas of Córdoba. In this region, the infection rate among pregnant women was found to be 45 %, as determined by real-time quantitative PCR.⁽¹²⁾

Complications from malaria are the causes that generally lead to death in patients if appropriate medication is not administered promptly. In the present study, cerebral malaria, acute anemia, and seizures were the most prevalent complications.

Other studies agree with this result, reflecting that these complications include cerebral malaria, pulmonary edema, acute renal failure, severe anemia, and/or bleeding along with metabolic complications. Acidosis and hypoglycemia are the most common complications in these patients.^(13,14)

Malaria deaths are increasing worldwide every year despite all the actions taken by various health organizations around the world. The results found in the research are modest, as the authors consider inadequate reporting in the death registry, considering that there may be errors in the diagnosis of the cause of death in the municipality of Cacolo, evidencing a bias in the information. The results differ from other literature reviewed.

Almost 85 % of malaria deaths worldwide in 2018 were concentrated in 20 countries in Africa and India. Nigeria accounted for nearly 50 % of all malaria deaths worldwide, followed by the Democratic Republic of Congo (11 %), the United Republic of Tanzania (5 %), Angola, Mozambique, and Niger (4 % each). Africa accounted for 93 % of all malaria deaths in 2017. Similarly, this region accounted for 88 % of the 172,000 malaria deaths worldwide reported in that same year.⁽⁷⁾

CONCLUSIONS

Malaria infection was more prevalent among females in the 15-19 age group. The most commonly reported symptoms were fever and headache. Uncomplicated malaria predominated. The most widely used drug combination was artemether/lumefantrine (20/120 mg). There was a low percentage of pregnant women with malaria in this study. The most frequent complication was cerebral malaria. There was a predominance of females among the deceased patients.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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