



Severe Malaria in Adults at the Yalgado Ouédraogo University Hospital of Ouagadougou, Burkina Faso: Epidemiological, Clinical, Therapeutic and Evolutionary Aspects

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: To describe the epidemiological, clinical, therapeutic and evolutionary characteristics of severe malaria in adults at the Yalgado Ouédraogo University Hospital from 2004 to 2021.

Methodology: This was a cross-sectional study, with retrospective data collection covering the period from January 1, 2004 to December 31, 2021. Patients with severe malaria diagnosed on the basis of clinical and biological signs, with a positive thick blood drop were included.

Results: During the study period, a total of 217 cases of severe malaria were recorded, representing a hospital prevalence of 2.1%. The mean age of the patients was 40 years \pm 20 with extremes ranging from 18 years to 92 years. Females predominated (52.8%) compared to 47.2% for males, i.e. a sex ratio of 0.89. Thirty percent of the patients lived in urban areas, 24% in semi-

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urban areas and 46% in rural areas. They were mostly housewives, farmers, pupils or students. Clinically, the functional signs of our patients were dominated by neurological signs, digestive signs and respiratory signs. The physical examination noted a systemic inflammatory response syndrome and multivisceral failure in the majority of patients. Biological disturbances were dominated by renal failure, severe anemia, thrombocytopenia and metabolic acidosis. Comorbidities were dominated by arterial hypertension, HIV infection and diabetes. Under treatment, the evolution was marked by a case fatality of 29.5%.

Conclusion: In clinical practice, severe malaria in adults is rare but potentially serious. It is frequently responsible for sepsis associated with multivisceral failure. Its prognosis depends on the rapidity of the diagnosis and the initiation of appropriate treatment.

Keywords: Severe malaria; adult; sepsis; multivisceral failure.

1. INTRODUCTION

Malaria is a vector-borne parasitic infection that has been prevalent since ancient times [1]. Nearly half of the world's population is at risk of malaria [2]. Despite a global funding effort through the Global Fund, the US President's Malaria Initiative, the Roll Back Malaria program, and the Abuja Declaration [2,3], malaria remains the most common parasitic endemic in the world. It is a priority public health problem, particularly in sub-Saharan Africa [4,5]. In Burkina Faso, malaria remains the leading cause of consultations in health facilities and the World Health Organization (WHO) estimates that the country recorded 3.2% of global cases in 2020 [6,7,8]. This is why Burkina Faso has subscribed to the global strategy to fight this scourge [2,4]. The COVID-19 pandemic that occurred in 2019 has had a negative impact on the fight against this disease [8]. Indeed, WHO estimates that in 2020, there would have been 14 million cases of malaria with 69,000 more deaths compared to 2019 [8]. Ninety-three percent (93%) of malaria cases and 96% of deaths occurred in the WHO African Region [8,9]. Most deaths were due to severe forms of *Plasmodium falciparum*. However, severe forms due to *P vivax* and *P Knowlesi* have also been reported to a lesser extent [10]. Several authors have reported the high lethality of severe forms of malaria, particularly in children, who pay a heavy price for this disease [11,12,13]. The development of the antimalarial vaccine, RTS, S/AS01, is a ray of hope since it would reduce severe forms of malaria in children by 30% [9]. Although children are more exposed to this disease, adult cases are also encountered in routine practice. The objective of this study is to describe the epidemiological, clinical, therapeutic and evolutionary characteristics of severe malaria in adults at the Yalgado Ouédraogo University Hospital from 2004 to 2021.

2. PATIENTS AND METHODS

This study involved all adult patients hospitalized for severe malaria in the medical emergency services and in the infectious diseases service of the CHU-YO from January 1, 2004 to December 31, 2021. Patients with severe malaria diagnosed on the basis of clinical and biological signs with a positive thick blood drop were included. Other biological tests were ordered to look for signs of severity. These were: blood count, creatinine, blood glucose, blood bicarbonate, transaminase, and bilirubin. The definition of severe malaria was the WHO definition [14].

Patients with severe malaria but whose records were not usable were excluded. For each patient included, socio-demographic, clinical, therapeutic and evolutionary variables were collected.

Data were entered, processed, and analyzed on a microcomputer using EPI info software version 7.2.2.6. Chi-square tests were used for statistical comparisons.

From an ethical point of view, the confidentiality and anonymity of the patients were respected in the processing and analysis of the data.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Epidemiological aspects

During the study period, a total of 217 cases of severe adult malaria were collected, representing a hospital prevalence of 2.1%. Fig. 1 shows the evolution of the cases according to the period. The mean age of the patients was 40 years \pm 20 with extremes ranging from 18 years to 92 years.

Females predominated (52.8%) compared to 47.2% for males, i.e. a sex ratio of 0.89. Thirty percent (30%) of the patients lived in urban areas, 24% in semi-urban areas, while the majority (46%) lived in rural areas. Table 1 shows the distribution of patients by occupation.

3.1.2 Clinical aspects

The average time to consultation for our patients was 5 days±3. Sixty-one patients had a medical history. Table 2 presents the distribution of patients according to their medical history.

Table 3 shows the distribution of functional signs of the patients.

The clinical and biological signs found in our patients are presented in Table 4.

3.1.3 Therapeutic aspects

Ninety-four percent (94%) of patients received artesunate injection with oral artemether +

lumefantrine. Eight percent (8%) of patients had received quinine, and 1% of patients had received artemether. All patients had received adjuvant therapy: 180 patients (83%) had received analgesic and antipyretic treatment; 73 patients (33.6%) had been rehydrated; 41 patients (19%) had received oxygen therapy; 39 patients (18%) had received anticonvulsant treatment with injectable diazepam or phenobarbital; 74 patients (34%) had received electrolyte supplementation; 116 patients (53.4%) had received antibiotic therapy; six patients (2.8%) had received resuscitation; 21 patients (9.7%) had received 10% hypertonic glucose serum; 70 patients (32.3%) had received a blood transfusion based on red blood cell concentrate.

The duration of hospitalization was less than seven days in 78% of patients. It was more than seven days in 22%. The evolution was marked by a lethality of 29.5%.

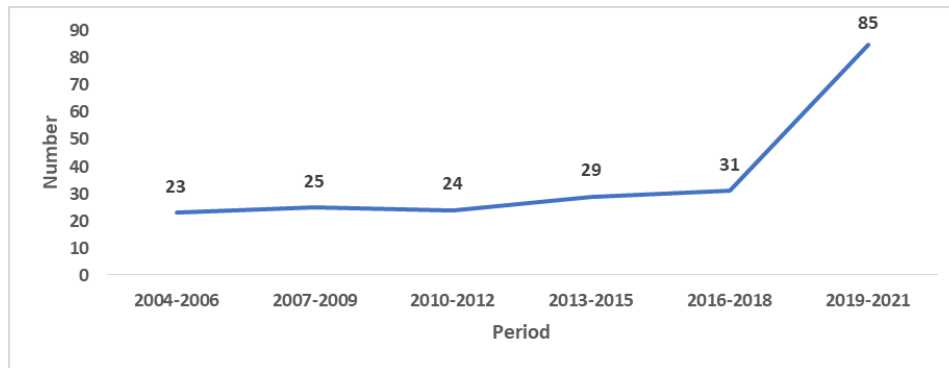


Fig. 1. Evolution of the 217 severe malaria cases according to the period

Table 1. Distribution of patients by occupation

Occupations	Number of patients	Percentage
Housewives	64	29,5
Farmers	53	24,5
Pupils / Students	52	23,9
Workers	20	9,2
Shopkeepers	17	7,8
Civil servants	11	5,1
Total	217	100%.

Table 2. Distribution of patients by medical history

Background	Number of patients	Percentage
HTA	23	10,5
Diabetes	13	5,9
HIV	13	5,9
Sickle cell disease	6	2,7
STROKE	6	2,7
Total	61	28,1

Table 3. Distribution of functional signs of the patients

Functional signs	Number of signs	Percentage
Headache	67	17,8
Vomiting	57	15,1
Disturbances of consciousness	53	14,1
Abdominal pain	41	10,9
Asthenia	37	9,8
Delirium	27	7,2
Anemia	25	6,6
Anorexia	21	5,6
Prostration	17	4,5
Coughing	8	2,1
Chills	8	2,1
Dizziness	8	2,1
Diffuse pains	8	2,1
Total	377	100

NB: a patient could have several functional signs.

Table 4. Distribution of clinical and biological signs of the patients

Signs	Number of signs	Percentage
Clinical signs		
Fever	155	16
Tachycardia	111	11
Coma	50	5,1
Hypotension	39	4
Respiratory distress	37	3,8
Altered general condition	35	3,6
Hemoglobinuria	27	2,8
Septic shock	27	2,8
Delirium	27	2,8
Jaundice	25	2,5
Convulsions	21	2,1
Hemorrhage	20	2
Agitation	17	2
Biological signs		
Creatinemia greater than 265µmol/l	87	8,9
Severe anemia	85	9
Thrombocytopenia	84	8,6
Metabolic acidosis	70	7,2
Peripheral oxygen saturation<90%.	39	4
Hypoglycemia	18	1,8
Total	974	100

NB: a patient could have several signs at the same time

3.2 DISCUSSION

In our study, the majority of severe malaria cases (39.2%) occurred during the first three years of the COVID-19 pandemic. Indeed, this disease had a negative impact on malaria control [8]. In our series, as in that of Yameogo, there was a predominance of the female sex, contrary to most African series [5,11,12,14,15]. The mean age of our patients was higher than in most African series [5,11,13,14,15]. As in the Eholié and Soumaré series [12,16], the functional signs

of our patients were dominated by headache. On physical examination of our patients, neurological signs predominated, while biologically, disturbances of renal function were frequently associated in our patients. The same observation had been made by Senegalese and Ivorian authors [5,12,17]. The mechanism of renal failure would be related to vascular obstruction by parasitized erythrocytes responsible for tubular necrosis [18]. The clinical and biological signs observed in our patients often evolved in a context of sepsis with multivisceral failure, severe

anemia, thrombocytopenia and acidosis, all of which are factors that worsen the prognosis of the patients [6,19,20,21]. Bruneel made the same observation in patients with severe imported malaria [22]. And he suggested that these patients should benefit from special and urgent management in intensive care [22,23]. Therapeutically, severe malaria is treated with intravenous artesunate according to WHO recommendations [24]. As soon as the patient is clinically stable and able to swallow, oral treatment with artemisinin derivatives should be administered [24]. The management of severe malaria must necessarily take into account the different disturbances that are associated [25,14,26]. The evolution was marked by a high case fatality in our series compared to most African series [5,11,12,17,16]. We agree with Eholié that despite the good efficacy of the antimalarial drugs used, the prognosis of severe malaria in adults remains severe. However, the prognosis could be improved by early diagnosis and appropriate management. To achieve this, adequate equipment of health care facilities is necessary [12].

4. CONCLUSION

Severe malaria in adults is rare in routine practice. It should be considered and a thick blood sample should be requested for any adult patient presenting with sepsis. The relative frequency of septic shock states during severe malaria requires the setting up and consequent equipment of intensive care and resuscitation units in our hospitals. Particular emphasis should be placed on prevention through vector control, the use of insecticide-treated mosquito nets, rapid diagnosis and treatment of simple forms of malaria, both in health facilities and in the community, and chemoprophylaxis in subjects at risk.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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