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Evaluation Of The Quality Of Care For Severe Malaria In Children Aged 0-59 Months At The Lisungi Hospital Center In The Commune Of Mont-Ngafula In Kinshasa, DR Congo

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Abstract

Background. Malaria remains a major public health problem worldwide. It is the most widespread parasitic disease in the world. Children under 5 years of age account for the majority of deaths from this scourge. Objective. The aim of this work is to describe the clinical, biological aspects and complications of malaria in children aged 0 to 59 months. Materials and methods. This retrospective documentary study was carried out during a period from JANUARY 4 to NOVEMBER 4, 2023 on a sample of 34 children received at the LISUNGI Hospital Center. Results. The most affected age group was between 24 - 35 months in 32.4% of cases. Males were the most affected with 67.6% of cases with a sex ratio of 2.09. Mont- Ngafula was the commune of origin of most patients, or 61.8% of cases. Anemia was the most common reason for consultation, or 32.4%, followed by fever in 26.5% of cases. The majority of cases had impaired consciousness, coma, or 41.2%. The thick drop was positive in 82.4% of cases, with a parasitemia of less than 250,000 trohozoites / ul in 76.5% of the 34 cases. Artesunate was the most used molecule, or 61.8%. The evolution of the patients was marked by recovery in 73.5% of cases with a death rate of 14.7% of cases. Conclusion. The age group of 0 to 59 months is the most affected by malaria of all forms; the neurological form of severe malaria is the most found, causing a good number of deaths. Malaria is therefore a real public health problem for which preventive measures must be undertaken.

Keywords – Severe malaria, Lisungi Hospital Center, Child, Kinshasa.

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1. INTRODUCTION

Malaria is an endemic disease caused by plasmodium, a blood haematozoan. It is a parasitic disease caused by a haematozoan transmitted by the bite of a female Anopheles mosquito (PNLP 2019), it is estimated that 300 to 500 million cases of malaria are recorded each year.

In endemic regions where there is a high frequency of cases of malaria, especially severe forms caused by plasmodium falciparum.

It is a febrile and hemolytic erythrocytopathy due to the presence and development in the human body of one or more hematozoa of the genus Plasmodium, which are transmitted by the infective bite of a vector mosquito of the Culicidae family and of the Anopheles genus (CHANTIERE.A, 1997).

Classically, there are four plasmodial species responsible for human malaria: Plasmodium vivax , Plasmodium malariae , Plasmodium ovale and Plasmodium falciparum . But there are also reports, in the forest areas of Southeast Asia, of increasingly frequent infestations by Plasmodium knowlesi , a parasite of monkeys.

Malaria remains a major public health problem worldwide (CLAYTON.SG, 1992; DANIS.F, GENTILLINI.M, 1993). It is the most widespread parasitic disease in the world. Plasmodium falciparum is the most widespread and the most fearsome since it is responsible for the potentially fatal pernicious attack (GENTILLINI.M, 1993).

Its socio-economic impact is considerable: reduced productivity, cost of care and hospitalization, especially in rural areas where the season of high malaria transmission coincides with the depletion of cereal reserves and the period of full agricultural activity. The overall economic cost of malaria is estimated at 12 billion US dollars per year for Africa alone.

In 2019, the World Malaria Report recalls that in 2018, about 228 million cases. Most malaria cases occurred in the WHO African Region with 213 million or 93%, followed by the WHO South-East Asia Region with 3.4% of cases and the WHO Eastern Mediterranean Region with 2.1% (FRIED.M, DUFFU.PE, 1998).

Nigeria accounts for almost 24% of all malaria deaths worldwide, followed by the Democratic Republic of Congo (11%), the United Republic of Tanzania (5%), Angola, Mozambique and Niger with 4% each (FRIED.M, DUFFU.PE, 1998).

Despite the measures envisaged and the efforts made in the fight against this disease, the morbidity and mortality related to it still seem high in children aged 0 to 5 years. This is why we conducted this study aimed at evaluating the clinical -biological and therapeutic aspects of severe malaria in children.

In order to properly assess the management of malaria patients in the city province of Kinshasa, we asked ourselves the following question: What are the epidemiological and clinical profiles of children suffering from severe malaria, as well as their management at the Mobikisi Health Center ? This is the fundamental question addressed in this study.

It is useful to know that malaria in children is a major public health problem in Africa. It has serious consequences on the lives of adolescents.

The general objective of this study is to describe the clinical, biological aspects and complications of malaria in children under 5 years old in the Pediatrics department of the MOBIKISI Health Center in the commune of MONT-NGAFULA in the city province of Kinshasa in the Democratic Republic of Congo. Specifically : (i) determine the frequency of malaria in children under 5 years of age seen in consultation in the Pediatrics department of the MOBIKISI Health Center; (ii) describe the socio-demographic characteristics of patients; (iii) describe the clinical aspects of malaria in patients; (iv) Determine the treatment regimen in the management of severe malaria in children; (v) Determine the outcome of children.

2. ATERIALS AND METHODS

2.1. STUDY FRAMEWORK

2.1.1. Name

Our study environment is called the LISUNGI Hospital Center in the commune of Mont- Ngafula in Kinshasa, in acronym "CHL". By its meaning, it is a state establishment of a medical and social nature, whose objective is to provide all individuals with quality care in a preventive, promotional and curative manner, with the aim of restoring and maintaining health balance.

2.1.2. Geographical location

LISUNGI Hospital Center is a clinic located near the market and government office, General Directorate of Taxes. Mont- Ngafula is located south of Kinshasa in the Commune bearing its name 31/2 km west of CHL (located near the Church of Sainte Rita and the Silo Evangelical Center). Landmarks:

- AENA (Church 300 meters to the North-East)
- DGRK (Government office 540 meters northwest)
- Pan-African University of Congo (4200 meters to the North) and the Faculty of Medical-Legal Institute, College 570 meters to the North
- Winners Chapel Green City 500 meters away
- Sainte Rita school 130 meters away
- Triangle bus stop 190 meters north
- UCC, University 640 meters to the East
- Cité Verte Bakery in the North West.

2.2. STUDY PERIOD

Our study spanned a period from JANUARY 4 to NOVEMBER 4, 2023.

2.3. STUDY POPULATION

Our study concerned all children who consulted the Pediatrics Department of the LISUNGI Hospital Center, in whom the diagnosis of severe malaria was made.

2.4. METHODOLOGY

- ***Type of study***

Our research is a quantitative, documentary, retrospective study.

- ***Sampling***

The sample of our study is 34 children from the LISUNGI Hospital Center who met our selection criteria out of the 173 files found.

- ***Selection criteria***
  - ✓ **Inclusion criteria**
    - Any child aged 0 to 59 months, hospitalized for severe malaria during the period of our study.
    - And having a complete medical file.

✓ **Exclusion criteria**

- Any patient suffering from severe malaria, but not included in the age group 0 to 59 months;
- Any child hospitalized not suffering from severe malaria;
- Any patient aged 0 to 59 months whose file was unusable or untraceable.

➢ ***Variables of interest***

The variables of interest were:

- Sociodemographic variables: Age, gender;
- Clinical profile: reason for consultation, admission procedures, medical history, therapeutic history, general and physical signs, signs of severity.
- Paraclinical profile : thick drop, parasite density, Hb .
- Management and prognosis: time to home management, antimalarials used, route of admission, therapeutic progress, availability of inputs.

➢ ***Data collection tools***

To make our collection effective, we used the tools below:

✓ A questionnaire or data collection sheet;
✓ Two pens (one blue and one red);
✓ A computer.
✓ Consultation registers;
✓ Consultation sheets;
✓ Hospitalization records.

➢ ***Conduct of the study***

The data collection activities were preceded by obtaining a research certificate at the LISUNGI Hospital Center, useful for collecting information for our study, I began to frequent the service by going through the various documents in order to extract useful information.

Whenever we came across cards containing a diagnosis of severe malaria, but with less readable or incomprehensible data, I consulted the doctors on duty to obtain clarification in order to decide whether to include or exclude the case.

➢ ***Data processing and statistical analysis***

For the processing and analysis of our data, we proceeded to manual processing (verification, numbering and coding). Data entry was done using Office Word 2010 software and analyzed with Excel 2016 and SPSS version 20.0 software.

The data were expressed in frequency and percentage and then presented in tables.

➢ ***Ethical question***

The handling of data at the time of their collection, recording on the sheets and statistical analyses, was kept anonymous in order to respect the confidentiality of the information; no procedure of the present study was harmful to the identity of the patients and the care providers.

- ***Difficulties encountered***

Our study encountered a number of challenges during data collection, including:

- Lack of order in the classification of patient files;
- Some clinical examinations were not carried out due to lack of financial resources;
- Absence of certain files in the classification;
- Absence of certain data (on medical records), essential for our study.

3. RESULTS AND DISCUSSION

3.1. HOSPITAL FREQUENCY

During our study period from January 4 to November 4, 2023, we reviewed the files of 173 malaria cases and retained 34 cases included in our study within the Pediatrics Department of the LISUNGI Health Center.

3.2. SOCIODEMOGRAPHIC DATA

3.2.1. Age

Table I. Distribution of patients by age

Age range (months)	n=34	Percentage(%)
0 – 11	5	14.7
12 – 23	8	23.5
24 - 35	**11**	**32.4**
36 – 47	6	17.7
48 – 59	4	11.8

This table shows that the most affected age group was between 24-35 months in 32.4% of cases.

3.2.2. Sex

Table II. Distribution of patients by sex

Sex	n=34	Percentage(%)
Male	**23**	**67.6**
Female	11	32.4

This table shows that the male sex was the most affected with 67.6% of cases with a sex ratio of 2.09.3.2.3. Municipality of origin

Table III. Distribution of patients according to the municipality of origin

Commune of origin	n=34	Percentage(%)
Lemba	6	17.7
Mount Ngafula	**21**	**61.8**
Ngaba	3	8.8
Kisenso	2	5.9
Selembao	2	5.9

This table shows that the majority of patients came from the Commune of Mont- Ngafula , or 61.8% of cases.

3.3. CLINICAL DATA

3.3.1. Months of hospitalization

Table IV. Distribution of patients according to month of hospitalization

Months of hospitalization	n=34	Percentage(%)
January	4	11.8
FEBRUARY	2	5.9
March	3	8.8
April	**8**	**23.5**
May	2	5.9
June	4	11.8
July	0	0
August	5	14.7
September	3	8.8
October	2	5.9
November	1	2.9

This table states that the month of April was the one that received several sick people, or 23.5% of cases.

3.3.2. Number of days before hospitalization

Table V. Distribution of patients according to the days elapsed before hospitalization

Days before hospitalization	n=34	Percentage(%)
1	5	14.7
2 - 3	**18**	**52.9**
4 - 6	7	20.6
7 and up	1	2.9
Not specified	3	8.8

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It is noted in this table that most children were kept at home for 2 to 3 days before consulting the hospital, i.e. 52.9% of cases.

3.3.3. Reason for consultation

Table VI. Distribution of patients according to reason for consultation

Reason for consultation	n=34	Percentage(%)
Anemia	**11**	**32.4**
Fever	9	26.5
Declining state of consciousness	8	23.5
Convulsions	3	8.8
Physical asthenia	3	8.8
Acute malnutrition	1	2.9
Anuria	1	2.9

Anemia was the most common reason for consultation, at 32.4%, followed by fever at 26.5% of cases.

3.3.4. Complications

Table VII. Distribution of patients according to complications

Complications	n=34	Percentage(%)
Coma	**14**	**41.2**
Convulsions	9	26.5
Distress respiratory	5	14.7
Anemia severe	3	8.8
Hypoglycemia	2	5.9
Fever bilious hemoglobinuric	1	2.9

Analysis of this table shows us that coma was the main sign of severity of severe malaria in 41.2% of cases.

3.3.5 . Associated pathologies

Table VIII. Distribution of patients according to associated pathologies

Associated pathologies	n=34	Percentage(%)
Meningitis	5	14.7
Verminosis	4	11.8
Fever typhoid	3	8.8
Pneumopathy	4	11.8
Malnutrition	2	5.9
Rhinopharyngitis	**9**	**26.5**
Dehydration	7	20.6

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It follows from this table that nasopharyngitis was the most common associated pathology in 26.5% of cases.

3.4. PATIENT CARE AND DEVELOPMENT

- ***BIOLOGICAL DATA***

3.4.1. Diagnostic mode

Table IX. Distribution of patients according to the mode of diagnosis

Diagnostic mode	n=34	Percentage(%)
Clinical	4	11.8
Clinical + organic	**30**	**88.2**

As this table shows, 88.2% of cases were diagnosed by combining clinical and biological findings.

3.4.2. Biological examinations

Table X. Distribution of patients according to biological tests

Biological examinations	n=34	Percentage(%)
Drop thick		
Positive	28	82.4
Negative	2	5.9
Not specified	4	11.8
Density parasitic		
<5% (<250,000 trophos)	26	76.5
>5% (> 250,000 trophos)	8	23.5
Thin smear		
Positive	16	41.1
Negative	1	2.9
Not specified	17	50
TDR		
Positive	21	61.8
Negative	7	20.6
Not specified	6	17.7

This table informs us that the majority of patients had a positive thick smear, i.e. 82.4% of cases, a parasite density of less than 250,000 trohozoites / ul , i.e. 76.5% of the 34 cases, a positive thin smear in 41.1% of the 17 specific cases and a positive TDR in 61.8% of cases.

- ***IMMUNOLOGICAL DATA***

3.4.3. Hemoglobin level

Table XI. Distribution of patients according to hemoglobin level

Hemoglobin level (g/dl)	n=34	Percentage(%)
<5	3	8.8
=5	6	17.7
>5	**25**	**73.5**

This table shows that the majority of patients had a hemoglobin level >5 g/dl in 73.5% of cases.

3.5. THERAPEUTIC AND EVOLUTIONARY DATA

- ***THERAPEUTIC DATA***

3.5.1. Self-medication

Table XII. Distribution of patients according to the type of self-medication

Self-medication	n=34	Percentage(%)
Modern	**24**	**70.6**
Traditional	2	5.9
Mixed	3	8.8
None	5	14.7

As this table shows, 70.6% of cases received medication at home before consulting.

3.5.2. Treatment with antimalarials

Table XIII. Distribution of patients according to the type of antimalarial

Type of antimalarial	n=34	Percentage(%)
Artesunate inj + ACT or Quinine Co	**21**	**61.8**
Quinine inj + ACT or Quinine Co	10	29.4
Artemether inj	2	5.9
Not specified	1	2.9

This table informs us that artesunate was the most used molecule, i.e. 61.8% of cases.

3.5.3. Admission procedures

Table XIV. Distribution of patients according to admission procedures

Terms and conditions admission	n=34	Percentage(%)
Coming from oneself	26	76.5
Referred		
Anemia severe	1	12.5
Coma	2	25
Dyspnea	2	25
Fever persistent	**3**	**37.5**

This table shows that the majority of patients came to consult on their own, i.e. 76.5% of cases compared to 23.5% of referred cases with the reason for referral being persistent fever in 37.5%.

- ***EVOLUTION***

3.5.4. Evolution

Table XV. Distribution of patients according to evolution

Evolution	n=34	Percentage(%)
Healing	**25**	**73.5**
Lost sight of	1	2.9
Death	5	14.7
Transferred	3	8.8

This table shows that the outcome of the patients was marked by recovery in 73.5% of cases with a high death rate of 14.7% of cases.

3.6. AVAILABILITY OF INPUTS

3.6.1. Availability of inputs

Table XVI. Distribution of patients according to availability of inputs

Availability of inputs	n=34	Percentage(%)
Inputs for paraclinical assessment		
Available	34	100
Not available	0	0
Drugs antimalarials		
Available	31	91.2
Not available	3	8.8

It is clear from this table that supplies for paraclinical examinations were always available for all patients; but as for antimalarial drugs, 8.8% of cases were lacking compared to 91.2% of situations where drugs were available.

3.7 . SUMMARY AND DISCUSSION

3.7.1. Sociodemographic data

In this study, we exploited sociodemographic variables, variables relating to the clinic, the management and the evolution of patients from 0 to 59 months suffering from severe malaria during the period of our study. After analysis of the results, some salient facts emerged:

Our work focused on the epidemioclinical profile and management of severe malaria in children aged 0 to 59 months at the Lisungi Hospital Center aimed to contribute to improving knowledge on severe malaria in children at the LISUNGI Hospital Center and in Kinshasa.

The age in our study ranges from 0 to 59 months with a mean of 2.9 months, estimated at 2.5 years. In the OKOKO AR series in Congo Brazzaville, the age ranged from 3 months to 15 years with a mean of 5.5 years. Children under 5 years were mostly affected by severe malaria with a predominance in the 3 to 5 year age group; In the publications of other authors, this age group of 0 to 5 years constituted a risk group for malaria.

The male gender was the most affected in this study with 67.6% against 32.4% for the female gender with a sex ratio of 2.09.

For some authors, the sex of children does not have a major impact on the occurrence of severe malaria.

In our series, most of the patients came from the commune of Mont- Ngafula , the commune where the Hospital Center of our study is located.

This situation can be justified by the proximity of patients to the Hospital Center.

3.7.2. Clinical data

In this study, the month of April was the month when the cases of hospitalization for severe malaria were effective and the patients were kept at home for 2 to 3 days before consulting the Hospital Center to benefit from treatment. This observation can be justified by the fact that the parents of sick children, to avoid hospital expenses, often try to self-medicate their children at home and end up returning to the hospital centers only in case of failure of treatment. In this series, the reason for consultation of children for malaria was summarized in the subjective signs as reported by the parents. Anemia and fever were the main reasons for consultation at the Lisungi Hospital Center . This observation is close to those of several others who place fever as the most preponderant subjective sign declared by the parents of the children.

In our series, the most serious complication that accompanied severe malaria was impaired consciousness due to coma. This observation was also made by TCHOUKOTEU, MOYEN G. and CAMARA, who placed the following signs in first position; these are fever , impaired consciousness, jaundice and dehydration. It should be noted that the clinical signs of malaria in children are almost identical in all literatures.

Signs of neurological severity (coma and convulsion) followed by signs such as anemia and respiratory distress dominated the clinical work of severe malaria in children in our study.

As is the case in most studies cited by MASIKINI BOMBAMU Fiston, neurological and anemic signs during malaria are prognostic factors for the severity of malaria in children according to MARSH.

3.7.3. Biological and immunological data

In our study, we noted that 88.2% of cases were diagnosed by combining clinical and biological findings. Of this, the majority of patients had a positive thick smear, i.e. 82.4% of cases, a parasite density of less than 250,000 trohozoites / ul , i.e. 76.5% of the 34 cases, a positive thin smear in 41.1% of the 17 specific cases, a positive TDR in 61.8% of cases and a hemoglobin level >5 g/dl

in 73.5% of cases. These results demonstrate the severity of the biological signs of malaria. The comparative literature presents the same observations as us. According to this literature, the signs of biological severity are a function of age and the clinical evolution of the disease.

3.7.4. Therapeutic and evolutionary data

The results of our study show that 70.6% of cases benefited from home medication before consulting. This reality is the custom of the majority of families who prefer to consult only when they encounter therapeutic failure. In our series, the antimalarial used during the first-line treatment of severe malaria was injectable Artesunate in 61.8%. TCHOUKOTEU and MOYEN G. reported the same observations in their work. This clearly shows that the recommendations of the WHO and technical bodies for the fight against malaria are followed to the letter. In our study, the majority of patients came to consult on their own, i.e. 76.5% of cases against 23.5% of referred cases. Overall, the evolution of patients was good with a survival rate of 73.5% against a death rate of 14.7%. ILUNGA-ILUNGA in the DRC, having worked in the same country, had found a result lower than ours with a death rate of around 5.9% while TCHOUKOTEU in Cameroon had found a result similar to our observation with a death rate of around 30%.

3.2.5. AVAILABILITY OF INPUTS

The results of our study stipulate that supplies for paraclinical examinations were always available for all patients even if in some cases, there was a lack of antimalarial drugs, i.e. 8.8% of cases. This reality supports the work of the health zone which supplies supplies each month to the health structures under its coverage.

4. CONCLUSION AND SUGGESTIONS

At the end of our study on the epidemio -clinical profile and the management of severe malaria in children aged 0 to 59 months at the Lisungi Hospital Center , we can draw the following conclusions:

- Severe malaria affected boys more often than girls in the 0-59 month age group;
- Severe neurological malaria is the clinical form most commonly encountered in children with coma as the major sign;
- Death occurred in 14.7% of patients.

These data will improve our knowledge of severe malaria in Kinshasa. We cannot conclude this work without making the following recommendations:

1. To the managers of the Health Center in the city of Kinshasa

- To ensure that consultation records and hospitalization files are kept in the pediatric department;
- To organize refresher sessions for medical staff in the pediatric department on emergency management;
- To return all medical records to the archives department promptly to facilitate research;
- To provide the archives department with computer equipment for the backup of all medical records.
- To ensure good management of stocks of supplies needed for malaria in order to be reassured of the quality of care

2. To the child's parents

- To always bring children on time for proper care, which will save them from complications;
- To avoid giving indigenous treatments which have not always proven their effectiveness on malaria.

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