

## Profile of Anemia in Children Aged 0 to 59 Months Treated at Kabondo Reference General Hospital of Kisangani City, R. D. Congo

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### ABSTRACT:

Severe anemia is a major risk factor for infant mortality and is a public health problem in our country, DR Congo. Most cases require urgent medical care with blood transfusions and a very high hospital bed occupancy rate. This cross-sectional study aims to determine the profile of anemia in children from 0 to 59 months in care at the Kabondo Reference General Hospital during 2017. Our study is transversal descriptive, based on the register of consultations of the pediatric department of the reference general hospital of Kabondo in the year 2017, and 3,641 cases were selected, and based on selection criteria, 486 cases were retained. At the end of our investigations, the following results were obtained: the anemias represent a significant morbid load with a hospital prevalence of 13.3%, in children from 0 to 11 months (38.9%) predominantly female (57.5%). The dominant clinical signs were: fever (40.3%) and digestive disorders (26.1%). 94.1% of cases were cured against 3.9% of deaths. These results demonstrate the use in case management by: 95.9% antianemic agents and 70.3% antibiotic therapy. This study brings to the database more information on the anemic profile of children aged 0 to 59 months treated at the Kabondo Reference General Hospital and gives the relevance of certain drugs in case management.

**Keyword:** *Anemia, public health problem DR Congo, infant mortality,*

### INTRODUCTION

According to the World Health Organization (WHO), anemia is the most common public health problem in the world, affecting all ages [1-3]. Two billion people around the world are affected by this disease, especially developing countries whose prevalence is of the order of 60% in pregnant women, 50% in children under 4 and 45% in school-aged children [4, 5, 6].

Severe anemia is a medical emergency that usually requires blood transfusion and; the hospitalization rate is relatively higher in sub-Saharan Africa [7]. The transfusion rate was 12.1% in 2016 at the Kinshasa Reference General Hospital and 9% at the Kabondo Reference General Hospital [8].

The management of anemia due to malaria is very important in Africa where mortality is very high among children [9]. As anemia problems are not adequately addressed in the child survival program, it was difficult to achieve the Millennium Development Goal (MDG). Because of multiple reasons related to infections, enzymatic deficiency (G6PD) and micronutrients, through intestinal parasites [10].

The situation is aggravated by the context of HIV infection. In fact, HIV contributes 45% of the deaths of children with severe anemia. According to several studies, malaria is among the main causes of anemia in areas of high endemicity. Severe anemia is one of the 15 criteria for severity of malaria formulated by WHO. With or without fever, children with moderate or severe anemia are among those with high parasitaemia, compared to children without plasmodia [11].

In the Democratic Republic of Congo, the decrease in the number of malaria cases was parallel to the decline in the rate of severe anemia. It accounted for 17% of hospitalizations in

patients treated for malaria during 2015. Severe anemia is the result of poor management of simple cases of malaria.

According to WHO, the risk of developing signs of untreated malaria severity ranges from 30 to 80%. The physiopathological mechanism is the destruction of erythrocytes or the dyserythropoiesis associated with certain etiological factors [12].

Promoting the national health policy of iron supplementation and malaria control could reduce the incidence of severe anemia and its deaths. In addition, improving access to quality health care remains essential.

The objective of our study is to determine the profile of anemia in children from 0 to 59 months in care at the Kabondo Reference General Hospital during 2017.

### FIELDS OF STUDY AND METHODS

#### *Fields of study*

This survey was conducted at the Kabondo General Referral Hospital, located in Kabondo commune, Kisangani City. It took place in the pediatric ward from 08 to 18 February 2018. This health facility covers a total population of 176,621 inhabitants in the city of Kisangani and its outskirts. This hospital has a capacity of 161 beds, including 26 for surgery, 26 for gynecology, 38 for maternity, 28 for internal medicine, 27 for pediatric and 16 for emergency.

#### *Size of the sampling*

Of 3,641 cases recorded in the pediatric ward at Kabondo Reference General Hospital during 2017; we were interested in 486 cases that met the inclusion criteria: children under 5 years, treated for anemia in the pediatric ward and with a complete

record, also the criterion of non-inclusion: anemic children over 5 years cared for in the pediatric ward and sickle cell children.

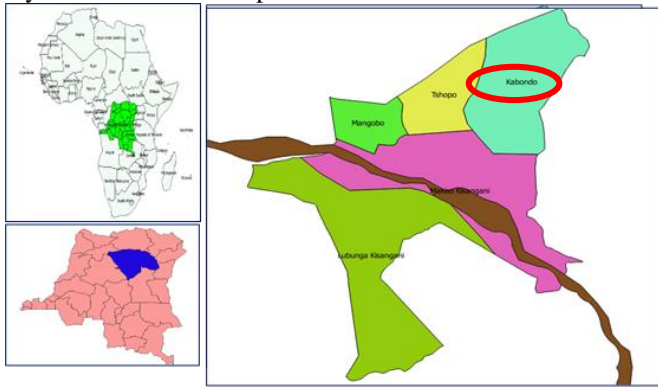


Fig. 1: Kabondo Reference General Hospital in Kabondo Commune, Kisangani City.

**Type of study**

Our study is descriptive transverse.

**Study parameters**

- Frequency of anemia by contribution to other pediatric pathologies;
- Ages
- Sex;
- Clinical signs;
- Complications;
- Supported;
- Exit modality.

**Analysis**

To analyze and interpret our data, we have grouped them into different tables and calculated the percentage using the following formula:

$$\% = fo \times 100 / N$$

Legend:

fo = observed frequency

N = sum of frequencies or total frequency

100 = conversion coefficient in percentage

% = percentage

**RESULTS**

From the consultation register of the pediatric department of Kabondo Reference General Hospital, 486 cases were selected in our investigation according to the inclusion and non-inclusion criteria set in our study.

**Age of the cases surveyed**

Table 1 shows that 38.8% of cases were aged 0 to 11 months and the low representativeness is between the age group from 48 to 59 months, equal 9.7% of cases retained.

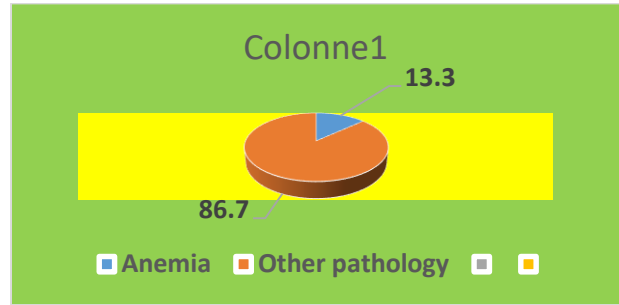
Table 1: Distribution of anemic children cared for by age

Age in months	Number	%
0-11	189	38.9
12-23	94	19.3
24-35	73	15.0
36-47	83	17.1
48-59	47	9.7
Total	486	100.0

**Prevalence of anemia**

Figure 1 shows the hospital prevalence of anemic children aged 0-5 years was estimated at 13.3%.

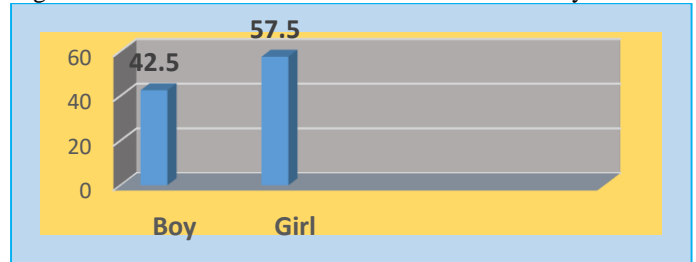
Figure 1: Distribution of children treated by pathologies in pediatric service



Sex

The data in Figure 2 indicate that the majority of children under-examination was female, or 57.5% of cases. Either, a sex ratio girl / boy is 1.4.

Figure 2: Distribution of anemic children cared for by sex



**Clinical signs**

The results in Table 2 divide cases of anemia according to the frequency of clinical signs: the highest is 40.3% of children with fever and the lowest is that of respiratory disorders with 7.5%.

Table 2: Distribution of anemic children treated according to clinical signs

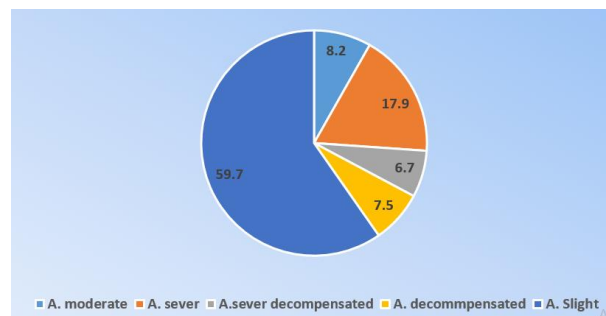
Clinical signs	Number	%
Fever	196	40.3
Asthenia	76	15.7
Digestive disorders	127	26.1
Respiratory disorders	36	7.5
Pallor	40	8.2
Other	11	2.2
Total	486	100.0

**Clinical hypotheses**

The results in Figure 3 give the different clinical hypotheses, the most common is mild anemia with 59.7% and the lowest is severe anemia decompensated with 6.7% of cases retained.

Figure 3: Distribution of children treated according to clinical assumptions: A. moderate, A. severe

A. severe decompensated, A. decompensated, A. slight



**Complications of anemia**

More than half of the anemic children receiving treatment had no complications, 58.2% and 35.0% of cases with convulsions, according to Table 3.

Table 3: Distribution of anemic children treated according to the complications of anemia

Complications	Number	%
Any	283	58.2
Convulsion	170	35.0
Other	33	6.8
Total	486	100.0

#### Medical management of anemia

The treatment of anemic children was made by antianemic agents (95.9%), antibiotics (70.3%) and blood transfusion (37.8%) on selected cases, according to Table 4.

Table 4: Distribution of anemic children treated following the medical management of global cases

Medical Support	Number	%
Antibiotic	342	70.3
Antipyretic	138	28.4
Transfusion	184	37.8
Metoclopramide	92	18.9
Hematinic	466	95.9
Other	79	16.2

#### Exit modality

94.1% of anemic children aged 0-5 years treated and cured at the Kabondo Reference General Hospital according to Table 5.

Table 5: Distribution of anemic children treated according to the exit modality

Exit Modality	Number	%
Exit Modality	457	94.1
Death	19	3.9
Not available	10	2.0
Total	486	100.0

## DISCUSSIONS

The results of our study show that anemia is a major public health problem, reaching 13.3% of children in the city of Kisangani. Despite the efforts of specialized child health promotion programs, this situation persists because of insufficient awareness-raising meetings with community members about the warning signs of this disease.

The analysis of the different tables shows the insufficiency of interventions in the management of anemia. In addition to the various factors such as geographic, financial and drug accessibility that negatively influence children's access to medical care structures; Kabondo Reference General Hospital has no support from health partners. The majority of child deaths (3.9%) are due to family poverty and the lack of a blood bank at the Kabondo General Referral Hospital.

The causes of anemia are numerous in poor countries [10]. Its high frequency (13.3%) is noted at the end of each rainy season in the city of Kisangani. As in the present study, several authors have shown that malaria is the main cause of anemia [13].

In Ghana, for example, the rate of anemia was high (22.1%) during the rainy season and this was consistent with the period of high malaria transmission [14]. The low prevalence of anemia in Kisangani City can be explained by the timid efforts of

national programs to fight malaria and nutrition. The city of Kisangani is located in the equatorial region where it rains nine over twelve months of the year, the multiplication of mosquitoes and the transmission of malaria are endemic and seasonal.

A study conducted in the city of Yaoundé in 2008, among children aged 5 to 10 years concluded that sickle cell disease and malaria played a key role in the occurrence of anemia [15] and malaria accounted for 71.58% of etiologies in 2003 in our study, the rate of severe anemia could be higher if we included sickle cell disease.

Strong parasitaemia was shown to be associated with anemia and high mortality in this group. On the other hand, other authors think of the overestimation of malaria in febrile patients residing in areas of malaria transmission. However, there is not a big difference between severe anemia in patients with or without plasmodium in the blood.

We observed that children aged 0 to 11 months and those aged 12 to 23 months represent successively 38.9% to 19.3% and they are the most affected by anemia. The female predominance of cases is estimated at 57.5%. Fever (40.3%) and digestive disorders (26.1%) were the main clinical signs recorded in our investigated cases.

In Gabonese children, the age group of 1 to 11 months had a high prevalence of severe anemia caused by malaria. On the other hand, children over six years of age had severe anemia of cause other than malaria. The risk of severe anemia caused by malaria was high in one-year-old infants during periods of high intensity of transmission and in 2-year-old infants during periods of low intensity. Anemia is a useful indicator for estimating the burden of malaria in areas of high endemicity [16].

A study was conducted in Tanzania, on children with asymptomatic anemia, found in the community children who had a low hemoglobin, that is to say  $<8 \text{ g / dl}$  and  $<5 \text{ g / dl}$  respectively at 87%, 39% and 3% of children. The authors described this situation as "silent anemia". And, when the symptoms appeared, they did not always go to the gravity of the pathology [17].

Regarding treatment, antianemic drugs (95.9%), antibiotics (70.3%) and transfusion (37.8%) were used more often. These led to 94.1% of cured patients without any complication (58.2%); except convulsion (35.0%).

In Cameroon, almost all cases of severe anemia were transfused, the rate of blood transfusion was 87% [7]. Blood transfusion is a protection against some deaths. This saving measure is not always easy to implement, it is linked to a reaction risk and disease transmission [18]. Indeed difficulties are related to the availability of blood in quality and quantity; systematic search for certain infectious agents.

In Tanzania, severe anemia had exposed approximately 19,000 children to HIV who survived through blood transfusion [13]. Some post transfusion septic states are the result of bacterial contamination of transfused blood. Indeed the bacteria were isolated in 8.8% of whole blood bags for transfusion in Kenya.

In general, blood transfusion should be reserved for cases where severe anemia is accompanied by signs of intolerance such as respiratory distress and especially at the beginning of hospitalization.

Considering the potential risk of transfusion, it is important to fight against all the risk factors for anemia. However, the focus is on the efficacy of treating uncomplicated malaria to prevent severe forms and malaria anemia. Some studies have demonstrated the protective effects of preventive treatment of ACTs on malaria and anemia [19].

In the Democratic Republic of Congo, the National Malaria Control Strategic Plan places importance on promoting the use of the Long-Lasting Insecticide-treated Mosquito Net (MILDA), the distribution of which continues on any the extent



of the country. Since 2010, the government has been offering free ACTs for the treatment of uncomplicated malaria in children under 5 years of age.

This policy makes it possible to remove certain barriers (geographic, financial and medical) to access to care. Unfortunately, their application is ineffective because of the limited accessibility to LLINs and the myth surrounding their use. Indeed, a small proportion of children under five slept under MIILDA according to the results of the Demographic Health Survey - Democratic Republic of Congo (EDS DRC II).

Three "delays" are put involved to prevent death from anemia. The first is the identification of palmar pallor depth and some signs of severity by the parents or health worker. The second is the urgency of decision-making to go for consultation or referral to an appropriate health facility. And, the third delay is the making of the blood transfusion decision based on clinical evidence. The strategy of "Integrated Management of Childhood Illness" in its community component, it strengthens the ability of parents and families to implement these first two points. To improve the application of this strategy, some authors recommend that the search for anemia take into account both conjunctival paleness, whimpering and palmar pallor.

Malnutrition is also a major contributor to morbidity and malaria anemia. The malaria control program is not going to be alone, a significant impact without the nutrition program. And, primary prevention of iron deficiency anemia and malaria can reduce deaths from anemia in young children living in endemic areas [10].

Our study nevertheless has some limitations. Because it is based on a single medical training whose population is not representative of the inhabitants of Kisangani, nevertheless for reasons of geographical, financial and preferential accessibility, this choice was imposed on us. In this study, we did not include sickle cell disease. Also the patients treated in the emergency department were not taken into account because of the difficulty of managing their files. But, this study has the advantage of providing basic elements that can constitute a database on this theme.

## CONCLUSION AND RECOMMANDATIONS

### Conclusion

In our descriptive cross-sectional study, we used the documentary technique to collect all relevant information. And his results led to the different observations:

1. The morbid burden of severe anemia represents a significant hospital prevalence equivalent to 19.3%;
2. Children aged 0 to 11 months and 12 to 23 months accounted for 38.9% and 12.3%, respectively;
3. Female children were more affected with 55.4% of cases, a sex ratio of girls to boys of 1.4;
4. The most prominent clinical signs were digestive disorders (26.1%) and fever (40.3%);
5. 59.7% of the subjects selected had mild anemia and 17.9% of cases of severe anemia;
6. Apart from convulsion (35.0%), we noted 58.2% of uncomplicated cases;
7. Treatment was anti-anemic (95.9%) and antibiotic therapy (70.3%) treated;
8. At the end of the hospitalization, we recorded 94.1% of cases discharged cured against 3.9% of deaths.

### Recommendations

In order to promote the health of our children and women in Kisangani City, we recommend:

1. Increase community awareness of the use of health services at the first signs of anemia.
2. Implement government policy of free child ACTs and the use of long-lasting insecticide-treated

bed nets (LLINs) to significantly reduce the incidence of malaria anemia.

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