

Clinical and Epidemiological Aspects of Severe Acute Malnourished Children from 6 to 59 Months Hospitalized in a Secondary Hospital in Mali

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Abstract

Introduction: Malnutrition acts on the immune system and thus increases susceptibility to infections. Infections can weaken the body and cause malnutrition, so we speak of a vicious circle between malnutrition and infection. **Objective:** To study the clinical and epidemiological aspects of severe acute malnutrition in children aged 6 to 59 months. **Methodology:** This was a prospective and descriptive study extending from July 1, 2018 to June 30, 2019. All severely acute malnourished children aged 6 to 59 months were hospitalized at URENI whose parents or careers accepted their participation in the study. **Results:** Severe acute malnutrition was diagnosed in 398 of the 671 hospitalized children, *i.e.* 59.3%. The median age was 15.33 months (2 months - 59 months). The sex ratio was 1.03 (M = 50.8 F = 49.2). Eighty-seven percent of mothers were housewives. Parents were uneducated in 49.3% for mothers and 51.8% for fathers. Marasmus represented 93.5% of cases, children diagnosed with HIV+ represented 6.3% with exclusively HIV1 (100%). Pneumopathy was most frequently associated pathology with 33.4%. The duration of hospitalization was less than 7 days in 67.6% of cases and 93.3% of children had been successfully treated. The mortality rate was 4%. **Conclusion:** Malnutri-

tion still remains a public health problem affecting mainly children aged 13 to 24 months, mainly from low-income families.

Keywords

Severe Acute Malnutrition, Children, Hospitalized, Mali

1. Introduction

The overall prevalence of acute malnutrition was 7.5% in 2014, or 50 million affected children, 16 million of whom were severely malnourished. Almost half of acutely malnourished children under five live in South Asia. In sub-Saharan Africa, prevalence was 8.3% in 2014, or 13 million children. It was higher in the West and Central Africa regions (10.1%) compared to the Eastern and Southern Africa regions (6.3%) [1].

According to the Mali Demographic and Health Survey (EDSM-VI) conducted in 2018, malnutrition levels are higher in rural areas than in urban areas: the prevalence of stunting varies from 29% to 17%, that of waste from 9% to 8% and that of underweight from 20% to 13% [2].

According to the same report (EDSM-VI), the percentages of malnourished children in all forms tend to decrease with the mother's level of education, from 30% when the mother has no level of education to 13% when she has secondary education or higher and, for wasting, from 9% to 7% respectively [2].

According to the SMART survey (Specific, Measurable, Accessible, Realistic, Timely) achieved in 2012 in commune VI, the prevalence of global acute malnutrition would be 8.8%, including 1.3% in the severe form [3].

Children with severe acute malnutrition have an increased risk of death compared to normal or moderately malnourished children [4].

Acute malnutrition remains a public health problem in developing countries, particularly in Mali. According to a study conducted by Sidibé B [5]. on the socio-economic profile of severely malnourished children, hospitalized in the pediatric department of the same commune in order to draw the attention of the political and health authorities to the nutritional status of children in commune VI.

2. Methods

Our study took place at the URENI of the pediatric department of Commune VI.

***Type and period of study**

This was a prospective and descriptive study that took place over a 12-month period from July 1, 2018 to June 30, 2019.

***Study population**

Severe acute malnutrition is defined as a weight-for-height ratio < -3 zscore or a PB < 115 mm with or without nutritional oedema. In the presence

of nutritional edema or poor appetite, management is done in hospitalization at URENI with F75 milk, then F100/plumpy and with drugs according to the recommendations of the National protocol for the management of acute malnutrition.

The sampling involved all children aged 6 to 59 months hospitalized for severe acute malnutrition at the URENI of the CS Ref CVI.

Selection criteria:

Inclusion criteria:

All children aged 6 to 59 months hospitalized for severe acute malnutrition at URENI and whose parents or careers have accepted their participation in the study.

Non-inclusion criteria:

- All hospitalized children whose parents refused to participate in the study;
- Children under 6 months and over 59 months;
- Children followed at URENAS for severe acute malnutrition.

***Conduct of the investigation**

Malnourished children were recorded in the hospital wards of URENI. Milks were prepared and administered according to weight and treatment phase.

- Every day the children are weighed and examined. The information was collected on an individual survey sheet whose main variables were: general characteristics (age, sex, residence, anthropometric parameters), clinical forms, associated pathologies, duration of hospitalization and immediate fate.

Data were entered and analyzed using Epi Info3.4.1dfr and SPSS version 16.0.

***Analysis and interpretation of results**

Data were entered using Excel2016 software and analyzed by SPSS version 16.0 software.

***Ethical aspects**

As part of the respect for confidentiality and the human person, we have obtained the informed consent of parents before collecting the data.

3. Results

Of the 671 children aged 6 - 59 months hospitalized in the paediatric ward; 398 had severe acute malnutrition, a frequency of 59.3%. The mean age of the children was 15.33 months. We noted a slight male predominance of 50.8%; 73.9% of our patients resided in the commune (**Table 1**).

Table 1 summarizes the general characteristics of all our patients.

At admission, 47.7% of children had a PB less than 115 mm; the average weight was 6.69 ± 1.35 kgs; Slump was the most common type of malnutrition with 93.5% of cases (**Table 2**).

Pneumonitis was the most common associated pathology followed by gastroenteritis with 33.4% and 32% of cases, respectively (**Table 3**).

The duration of hospitalization was less than 7 days in 67.6% of cases with a mean duration of 6.53 ± 4.48 days (**Table 4**).

Table 1. General characteristics of sam children

Characteristics	Actual	Percentage
6 - 12 months	176	44.2
13 - 24 months	192	48.2
25 - 36 months	18	4.5
37 - 48 months	12	3.0
Male	202	50.8
Female	196	49.2
Commune VI	294	73.9
Outside Commune VI	104	26

Table 2. Distribution of children according to anthropometric parameters of admission.

Anthropometric parameters	Actual	Percentage (%)
3 - 6 Kg	271	68.1
7 - 9 Kg	120	30.2
10 - 12 Kg	7	1.8
<115 mm	190	47.7
115 - 125 mm	186	46.7
>125 mm	22	5.5

As regards the clinical form, stagnation was the most common form of malnutrition with 93.5% of cases.

Table 3. Distribution of patients by pathologies associated with malnutrition.

Associated pathologies	Actual	Percentage (%)
Pneumonia	133	33.4
Gastroenteritis	127	32%
Digestive candidiasis	46	11.6
Malaria	50	12.6
HIV	25	6.3
Other	17	4.3

Table 4. Distribution of patients according to patient evolution/fate.

Become	Actual	Percentage (%)
Successfully Processed	371	93.3
Deceased	16	4.0
Referred	11	2.8
Total	398	100

Recovery rate was 93.3% of cases.

4. Discussion

The objective of this work was to study the clinical and epidemiological aspects of severe acute malnutrition in children aged 6 to 59 months. It made it possible to highlight: socio-demographic data, associated pathologies and evolution under treatment.

- **Epidemiological aspects**

Our study shows that children aged 12 to 24 months were the most represented with 48.2% of cases; this same observation was made by TRAORE F M. at the CHU-GT [6]. Indeed, it is a critical period of withdrawal that is often marked by a high frequency of infections, abrupt and early weaning and where food is not sufficient to cover growth needs, which aggravates nutritional deficiencies and exposes the child to malnutrition.

Male sex predominated in our study. Several studies have found the same results without the difference between the two sexes being really statistically significant. However, male predominance is classic in pediatric morbidity [7] [8].

- **Clinical aspects**

Marasmus was the most common form with 93.5% of cases. Studies carried out in other structures in Mali and Africa have reported a predominance of SAM without edema, this figure is higher than those of GUINDO S O. and TRAORE F M in Mali, Ouédraogo SO in Burkina Faso, D Bonkano in Niger, which found respectively 82.5%, 73.74%, 81%; 78%; 86.30%, 66.1% and 53% of cases [6] [7] [9] [10]. In contrast, kwashiorkor was the predominant form of malnutrition in the series of Mwene-Batu P *et al.* and Mbusa Kambale R *et al.* in the Democratic Republic of Congo [11] [12]. The high frequency of marasmus in our study may be related to an overall dietary deficiency in children from an early age. Pneumonitis was the most common associated pathology with 33.4% followed by gastroenteritis with 32%. These results are similar to those found by TRAORE F M. who found 32.35% for pneumonia and 28.92% for diarrhea [6]. No cases of tuberculosis were clarified during our study despite the prevalence of pneumonia. The predominance of signs of respiratory and digestive calls can be explained by the communication of these devices with the outside and the weakening of the immune status of children, and the significant disruption of the intestinal flora. During our study, HIV serology performed during hospitalization was positive in 6.3% of children; this figure is higher than that found by Mbaye Ngagne *et al.* who had found 3% [13] in Dakar. This is explained by the fact that HIV serology was systematic in us from admission HIV1 was the type exclusively found which was also reported by Mbaye Ngagne *et al.* in Dakar [13].

- **Evolution**

During our study, 93.3% of the children had been successfully treated, this result is similar to that found by GUINDO S O. 92.5% [7] and higher than those found by FOFANA B. and NANTOUME A. who had found 80% and 77.8% respectively [14] [8].

We found a lethality of 4%, these deaths could be caused by an alteration of

the immune system caused by malnutrition hence a high vulnerability to infections; and late consultation of sick and/or malnourished children, which occurs only when complications such as diarrhoea, anaemia or respiratory infections appear. This death rate is lower than those found by Mbusa Kambal R and Mwene-Batu P in DRC, DIARRASSOUBA G. *et al.* in Côte d'Ivoire and KONE A. in Mali who found respectively 7.5%, 15.1%, 36.7% and 16.2% [11] [12] [15] [16].

The mean length of hospital stay was 6.53 ± 4 days with extremes of 4 to 32 days; on the other hand, D BONKANO had found an average duration of 15.7 days [10]. The length of stay depends on the associated comorbidities and the possible presence of oedema.

5. Conclusion

During our study, we found that 398 children aged 6 to 59 months were severely acutely malnourished. Children aged 12 to 24 months were the most affected. Stagnation was the predominant form. Pneumonitis has been found in the majority of our patients. Malnutrition is still a public health problem, especially affecting developing countries, including Mali.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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