

Epidemioclinical and Therapeutic Aspects of Malnutrition at Pediatrics Department of Mali Hospital

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Abstract

Original Research Article

Severe acute malnutrition still constitutes a worrying public health problem today. In its complicated form, it remains a significant cause of infant mortality in our countries. **Objective:** To study the epidemiological-clinical and therapeutic aspects of Severe Acute Malnutrition (SAM) complicated by anemia. **Methodology:** This is a retrospective descriptive study from 2019-2020 and prospective 2021 which took place at the Mali hospital. The study focused on all children aged 6 to 59 months hospitalized for severe acute malnutrition complicated by anemia. **The Results:** From January 1, 2019 to December 31, 2021, we screened 5,676 children among whom 200 children were diagnosed with SAM complicated by anemia with a hospital frequency of 3.52%. Children under 5 years old were the most represented with 85.5% of cases. There was no predominance of sex, the ratio =1. In our study, marasmus was the majority with a rate of 88.5% followed by kwashiorkor 7% and the mixed form 4.5%. The main complications observed were dehydration, fever, severe anemia and hypoglycemia with respective rates of 27%, 16%, 13.5% and 9.5%. The patient profile had hypochromic microcytic anemia with a number of 167 or 83.5% most often linked to iron deficiency. Gastroenteritis, pneumonia, malaria, and cerebral palsy were the most frequent associated pathologies during our study with respective rates of 48.5%, 34%, 26% and 12.5%. **Conclusion:** At the end of our study at the Mali hospital where the investigation took place, we managed to conclude that children aged 6 to 59 months who were screened for severe acute malnutrition had severe anemia with a rate of 13.5% microcytic type to 83.5% which explains that iron deficiency was the most plausible cause and 57% of these children screened had pallor.

Keywords: Malnutrition, Anemia, Child, Therapeutic.

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INTRODUCTION

Malnutrition is a pathological state resulting from the deficiency or relative or absolute excess of one or more essential nutrients, whether this state manifests itself clinically or is only detectable by biochemical, anthropometric or physiological analyzes [1]. It is both a medical problem and a social problem. The child's medical problems result in part from social problems in the home in which he lives. Malnutrition is the result of chronic and, often, emotional nutritional deprivation: ignorance, poverty and family difficulties prevent parents from providing the malnourished child with the necessary care and nutrition [2].

In the world, 1/3 of children under 5 years old are affected by malnutrition, of which: 70% live in Asia, 26% in Africa and 4% in Latin America and the Caribbean [3]. In 2009, the Food and Agriculture Organization of the United Nations (FAO) estimated the number of people suffering from severe undernutrition at more than one billion worldwide [4]. According to the FAO, 1.02 billion people still suffer from undernutrition, a serious form of malnutrition, 99% of whom live in developing countries [4]. The rate of acute malnutrition was 20% in the Sahelian strip of Chad in August 2010. It exceeded 17% in Agadez and Zinder in Niger in October 2010 [5]. In Mali, according to the MICS survey in 2010, moderate acute malnutrition is 18.9% and severe acute malnutrition 5.3% among children aged 6 to 59 months

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[6]. The causes of severe acute malnutrition are on the one hand food insecurity, poverty, poor weaning practices, infectious diseases, and on the other hand natural disasters and civil wars [7]. Anemia is defined according to the WHO as a decrease in hemoglobin concentration below the limit values considered normal depending on the age, sex and physiological state of the individual. It remains a public health problem in both industrialized and developing countries. Globally, a third of the population suffers from anemia and around 50% of vulnerable people are affected.

Africa and Asia are the most affected regions [8]. Anemia, in tropical regions, is linked to numerous parasitic, infectious, genetic and nutritional causes, always with the presence of iron deficiency (Dillon, 2000) [9].

PATIENTS AND METHOD

The study took place in the pediatric department of Mali hospital, located in commune 6 of the Bamako district. This was a retrospective descriptive study of data from 2019-2020 and prospective 2021. It took place over a period of 3 years. The study focused on all children aged 6 to 59 months hospitalized for severe acute malnutrition complicated by anemia. The data collected was using a pre-established survey form. These data were entered and processed electronically using Microsoft Word 2016, Excel 2016, and SPSS 21 software. Informed consent was obtained from the parents of all patients.

Collections and dosage of venous blood samples from each child are collected in tubes containing an anticoagulant, Ethyl Diamine Tetra Acetic (EDTA) in the morning. These blood samples are transported before 12 p.m., the same day of collection to the Biology Laboratory of the Mali hospital for the completion of the blood count. The determination of the hematological parameters of the blood count was carried out immediately after homogenization on Coulter, by a Sysmex KX 21N automatic analyzer. Criteria defined by the World Health Organization (WHO) were used to estimate the different prevalences of the main hematological parameters. Anemia was defined according to WHO criteria by a hemoglobin level below 11.5 g/dL. Anemia is considered mild for a hemoglobin level between 10.6 and 11.4 g/dL, moderate for hemoglobin levels between 6.5 and 10.5 g/dL. The mean corpuscular volume (MCV) is considered normal for values between 80 and 100 fl, microcytosis and macrocytosis are defined for values lower than 80 and greater than 100 fl respectively. The normal value of corpuscular hemoglobin content (TCMH) is 24 pg.

Anthropometry:

Weight was measured upon admission and every day using a SECA brand mother/child electronic scale with a range of 150 kg with an accuracy of ± 100 g. Height was measured using a locally manufactured

Unicef measuring rod and mid-upper arm circumference (MUAC) with a Unicef measuring tape. Edema was looked for in both lower limbs. Their presence or not, as well as the anthropometric indices and the MUAC made it possible to classify and monitor the evolution of subjects during hospitalization. The minimum weight of a child affected by kwashiorkor corresponded to that observed after the complete disappearance of the edema. We searched for acute and chronic pathologies and described the demographic and clinical aspects as well as the evolution during hospitalization.

Research Ethics:

The study was approved by the ethics committee of the Mali Hospital. Parental approval was obtained in advance after written or verbal consent. No invasive procedure was performed, and parents were free to refuse without any influence on the follow-up of their children. No parent refused to participate in the study or withdrew during the study.

RESULTS

Sociodemographic Aspects:

Frequency:

From January 1, 2019 to December 31, 2021, we collected 5,676 children among whom 200 children were diagnosed with SAM complicated by anemia with a hospital frequency of 3.52%. All of his children met our inclusion criteria.

The average age was 12 months. There was no gender predominance during our study; the frequency of SAM was the same in both sexes (male and female). We found more stay-at-home mothers with a rate of 83%. The fathers of our patients were not educated in 67.5% of cases. For the admission period the maximum number of cases was recorded in the 3rd trimester during our study corresponding to the beginning of the peak malaria period.

Clinical Forms of Severe Acute Malnutrition:

For the clinical forms of severe acute malnutrition in our study, marasmus was the majority with a rate of 88.5%, followed by kwashiorkor 7% and the mixed form 4.5%. In a study done on malnutrition, 17.0% had kwashiorkor and 9.8% had marasmus.

Prevalence and Typologies of Anemia:

Prevalence:

Moderate anemia is 61% or 122 cases for all cases of severe acute malnutrition with 41% anemia in marasmus and 20% in kwashiorkor.

Typology:

Among these anemias, according to the TCMH 53.5% are hypochromic, 29.5% normochromic, and according to the VGM 16% are normocytic, 83.5% microcytic and 0.5% macrocytic.

Duration of Stay: The average length of hospitalization was < or =7 days with extremes ranging from 1 to 27 days.

Treatments and Discharge Status:

In our study, 97.5% of children were treated with therapeutic milk in the acute phase, 95.5% with antibiotics, 76.5% with RUTF in the transition phase, to correct anemia; the malnourished were treated with therapeutic milk which is already rich in iron.

DISCUSSION

Limitations of the Study

Few studies have been carried out on severe acute malnutrition complicated by anemia. This is the first at the Mali hospital concerning only hospitalized patients. The data that we were able to collect made it possible to carry out analyzes which led to results that could be commented on and discussed with regard to our objectives and compared to the literature. Our study is a retrospective study ranging from the year 2019 to 2020 for the retrospective and 2021 for the prospective. Like any retrospective study; we were faced with difficulties linked to missing data (incomplete files). These missing data concerned certain sociodemographic data.

Sociodemographic Aspects:

Age:

In our study, infants were the most affected, with the most represented age group being 13 -24 months, i.e. a rate of 4.5%. Our results were similar to those reported by a study carried out in Cameroon, the age group of 12 to 23 months was the most represented [10]. The age group of 12-23 months was the most affected, i.e. 166(58, 50%) in a study carried out at CHU-GT [11]. The frequency of malnutrition in this age group could be explained by repeated infectious diseases, participation in family meals and poor socioeconomic conditions.

Gender:

There was no gender predominance during our study; the frequency of SAM was the same in both sexes (male and female); however some have found a male predominance: Brahim K. Barry [12], Emil S [13], with respective rates of 1.1%; and 1.8%.

Origin:

Most of the children resided in Bamako precisely in commune 6, i.e. 77.5%. Contrary to the results reported by Tangara AA [14], the peripheral districts of commune 1 were the most represented with respective rates of 20.4%. The predominance of commune 6 in our study could be explained by the fact that the MALI hospital is the center most accessible to the population of commune 6.

Clinical Forms of Severe Acute Malnutrition:

For the clinical forms of severe acute malnutrition in our study, marasmus was the majority

with a rate of 88.5%, followed by kwashiorkor 7% and the mixed form 4.5%. Contrary to the results in a study carried out in Cameroon on malnutrition, 17.0% had kwashiorkor and 9.8% marasmus, and (73.2%) had kwashiorkor-marasmic [10]. Marasmus was the most observed clinical form, 205 cases or 73.74%; 33 cases of kwashiorkor, i.e. 11.87%, and 40 cases of mixed form, i.e. 14.39%, in a study carried out at CHU-GT [11].

Prevalence and Typologies of Anemia:

Prevalence:

Moderate anemia was 61% or 122 cases for all cases of severe acute malnutrition with 41% anemia in marasmus and 20% in kwashiorkor. A study carried out in Ivory Coast on nutritional anemia found a rate of moderate anemia of 30.3% [15].

Typology:

Among these anemias, according to the TCMH 53.5% are hypochromic, 29.5% normochromic, and according to the VGM 16% are normocytic, 83.5% microcytic and 0.5% macrocytic. In view of these results, hypochromic microcytic anemia was the most represented indicator of iron deficiency. This iron deficiency during severe acute malnutrition is explained by an increase in physiological iron needs linked to height and weight growth; chronic iron losses due to parasitosis, poor iron absorption following episodes of diarrhea and inadequate diet.

In Relation to Associated Pathologies:

Gastroenteritis, pneumonia, malaria, and cerebral palsy were the most frequent associated pathologies during our study with respective rates of 48.5%, 34%, 26% and 12.5%. In the study carried out at CHU-GT, the most frequent associated pathologies were pneumonia (32.35%), Diarrhea/Vomiting (28.92%), HIV (17.65%) [11].

Duration of Stay:

The average length of hospitalization was < or =7 days with extremes ranging from 1 to 27 days. Emile S [14], found an average duration of 8 days with extremes of 1 to 30 days.

We found that the occurrence of death in phase 1 of nutritional treatment and non-responsiveness to nutritional treatment contributed significantly to increasing the length of stay in our study.

In Relation to Treatments and Discharge Status:

In our study, 97.5% of children had been treated with therapeutic milk in the acute phase, 95.5% with antibiotics, 76.5% with RUTF in the transition phase, to correct anemia; the malnourished were treated with therapeutic milk which is already rich in iron. However, a study has shown that anemia in malnourished children is often improved by nutritional support, even without iron intake [16]. 46.5% had been dewormed.

We had 73% treated successfully, death at 16%, abandonment 3.5% and medical transfer 7%. Our death rate is higher than that of Maiga B [11], with a death rate of 8.99%. Our death rate could be due to the delay in transfer/referral by certain 1st and 2nd referral health structures, comorbidity and the delay in treatment by parents who first opted for self-medication.

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