



Original Article

Severe Acute Malnutrition in Children Infected with Acquired Immunodeficiency Virus in Souro Sanou University Hospital of Bobo-Dioulasso (Burkina Faso)

Malnutrition aiguë sévère chez l'enfant infecté par le VIH au CHU Souro Sanou de Bobo-Dioulasso (Burkina Faso).

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ABSTRACT

Objective. To compare the profile of acute malnutrition among HIV positive and HIV negative children. **Methods.** This was a retrospective transversal analytic study concerning 231 severely malnourished children aged 0-5 years hospitalized from January 1st, 2008 to June 30th, 2009 (18 months) in the pediatrics department and monitored in educational and nutritional rehabilitation centre of the department. Our data of interest were epidemiology, clinical and therapeutic features and issue. **Results.** We did not notice any significant difference between age and serology. Also, there was no statistically significant difference between gender and serology nor with the type of malnutrition. Urban -born children were more exposed to HIV infection (79.6% vs 57%; p=0,000). The percentage of HIV infected children was 44,6% of which 94,2% of the serotype HIV1 and almost 80% of the infected children were severely immunodepressed (rate of CD4 inferior to 25%). Marasmus was the most noticeable type of malnutrition to infected children combined with Candida and cutaneous lesions. The non infected children had more edema. Blood transfusion concerned more the non infected children and the latter had a good nutritional rehabilitation with the new national protocol. The infected children were more inclined to die than the non infected children. **Conclusion.** The nutritional monitoring of infected children, the rapid access to ARV are measures which will permit to reduce the occurrence of acute malnutrition among these children and reduce the high mortality rate that we noticed.

RÉSUMÉ

Objectif. Comparer de la malnutrition aiguë sévère chez l'enfant infecté et celui non infecté par le VIH. **Méthodes.** Étude transversale analytique rétrospective concerne 231 enfants malnutris sévères âgés de 0-5 ans hospitalisés du 1^{er} janvier 2008 au 30 juin 2009 (18 mois) dans le département de pédiatrie et suivis au centre d'éducation et de récupération nutritionnel du département. Nos paramètres d'intérêt étaient les aspects épidémiologiques, cliniques, thérapeutiques et évolutifs. **Résultats.** On ne notait pas de différence significative entre l'âge et la sérologie, le sexe et la sérologie et non plus avec le type de malnutrition. Les enfants provenant du milieu urbain étaient les plus exposés à l'infection par le VIH (79,6% contre 57% ; p=0,000). Le pourcentage d'enfants infectés par le VIH était de 44,6% dont 94,2% du séro-type VIH1 et près de 80% de ces enfants infectés étaient sévèrement immunodéprimés (taux de CD4 inférieur à 25%). Le marasme était la forme de malnutrition la plus observée chez les enfants infectés associé à des lésions candidosiques et cutanées. Les enfants non infectés présentaient plus d'œdèmes. La transfusion a d'ailleurs concerné les enfants non infectés et ces derniers avaient une bonne récupération nutritionnelle avec le nouveau protocole. Le risque de décès était plus élevé chez les enfants infectés. **Conclusion.** Le suivi nutritionnel des enfants infectés, l'accès rapide aux ARV sont des mesures qui permettront de réduire la survenue de la malnutrition sévère chez ces enfants et réduire la forte mortalité observée.

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INTRODUCTION

Malnutrition is a pathological condition resulting from a deficiency or an excess, relative or absolute, of one or more nutrients essential to the proper development of the living organism. Malnutrition is frequently observed in

sub-Saharan Africa, particularly among babies and young children. Causes are numerous: lack of intakes, dietary errors, repeated infections, chronic diseases [1]. This condition is either clinically manifest or detectable only by biochemical, anthropometric and physiological analyzes [2]. HIV infection is an important risk factor for

developing malnutrition. HIV weakens nutritional status by compromising the immune system [3].

The aim of our work was to study the relationship between human immunodeficiency virus (HIV) infection and malnutrition in children admitted in our department.

METHODS

This was a cross sectional, retrospective, descriptive and comparative study covering the period from January 1, 2008 to June 30, 2009. We included patients who were aged between 0 and 59 months and had done a retroviral serology test with:

- a weight-for-height index less than 70% (or less than - 3 z-scores) of the median of the NCHS/WHO reference,
- or the presence of bilateral nutritional edema,
- hospitalized in the pediatric department and followed-up at the Center for Recovery and Nutritional Education (CRNE).

We used the files of the patients and their monitoring sheets from the Center for Recovery and Nutritional Education. Our data of interest were epidemiology, clinical and therapeutic features and issue. We used the Chi-square test and the Barlett test for comparison of means. The significance level used was $p < 0.05$.

RESULTS

Sociodemographic data

The study population consisted of 231 children including 102 HIV-infected children and 128 uninfected children. The sex ratio was 1.24 in uninfected children against 1.02 in infected children (no significant difference). Table 1 summarizes the epidemiological characteristics of the sample according to HIV status.

Table 1 : sociodemographic features of the study population

	HIV+	HIV-	p
Mean age (months)	22.2(2-59)	18.1(1-59)	0.05
Average weight (g)	6820.7(2100-15000)	5951.2(2180-12000)	0.022
Average size (cm)	77.4 (50-117)	72.62 (52-97)	0.014
Sex			
Male	52(22.5)	71(30.7)	0.45
Female	51(22.1)	57(24.7)	
Origin			
City of Bobo	82(35.5)	73(31.6)	0.000
Other	21(9.1)	55(23.8)	
Profession of parents			
Employee	16(6.9)	4(1.7)	0.000
Other	87(37.7)	124(53.7)	
Immunization status			
Complete	68(29.4)	68(29.4)	0.048
Incomplete	38(16.4)	60(26)	
Type of malnutrition			
Marasmus	86.5	71.1	
Kwashiorkor	5.8	10.1	
Mixed	7.7	18.8	

Clinical data

Marasmus was the most common form of expression, accounting for 180 children (77.9%) in the general population.

Marasmus was more common in the group of infected malnourished children (88 children, 86.5%) than in the group of uninfected children (91 children, 71.1 %) and the difference was statistically significant ($p=0.005$). The edematous form was more common in uninfected children.

More skin lesions were observed significantly in infected children ($p=0.018$) and also more oral candidiasis ($p=0.000$).

In addition an hepatomegaly was noticed in infected children (29 against 22 with $p=0.046$).

Biological data

In our sample of 103 (44.6%) children infected with HIV, 97 children (94.2%) were infected with HIV 1 against 3 children (2.9%) for HIV 2 and also 3 children (2.9%) for HIV1+2. The mean CD4 count was 17.57% with extremes of 1 and 46%. Only 4 patients out of 103 infected children had not benefited from achieving CD4 count and nearly 80% of these children had a CD4 count $< 25\%$, thus, severely immunocompromised.

Of the 231 children, 197 (85.2%) had benefited from a blood count and among them 87.8% (173 children) were anemic (hemoglobin $< 11g / dl$) against 12.2% not anemic. Of the 197 children, 33% or 65 children had a hemoglobin level below 7g/dl. Only 24 children, or 12.2% of these 197 children had a hemoglobin level above 11g/dl.

Modalities of treatment

After re-nutrition with standard products or ready-to-use therapeutic products, antibiotics were the most common drugs that were used.

Cotrimoxazole was administered in 153 (66%) of the 231 children. Infected children significantly received cotrimoxazole more than uninfected patients (100 against 45 with $p=0.000$). Of the 231 children, 159 (68.8%) had received an antimycotic and those who were infected received more than the uninfected ($p=0.009$).

Uninfected children were also transfused more often (47 against 17 with $p=0.004$).

Evolution of children

The average follow-up time for uninfected malnourished patients was 24 days with extremes of 0 and 147 days against 21 days with extremes of 0 and 120 days for recovered malnourished infected children.

The mean daily weight gain per kg body weight was 5.5 g/kg/day in infected children against 7.9g/kg/day in uninfected children. There was a statistically significant difference between daily weight gain and serology ($p=0.049$).

Uninfected children had a daily weight gain higher than infected children.

The analysis of the weight curve of the children of our sample followed-up at the Center for Recovery and Nutritional Education of Sourou Sanou University Hospital of Bobo-Dioulasso (CHUSS) showed the following results according to the serology (Figure 1).

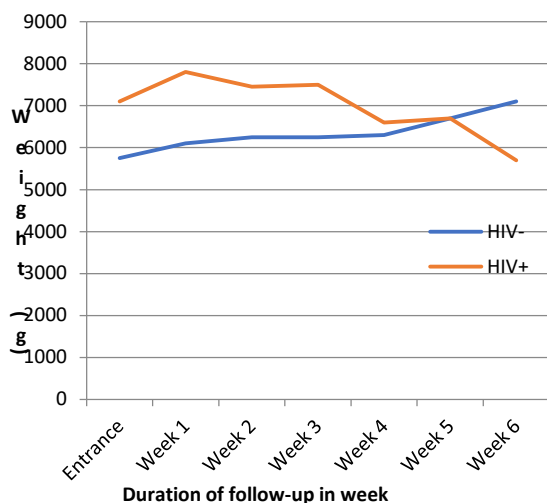


Figure 1: Evolution of body weight according to HIV serology during the follow-up at the Center for Recovery and Nutritional Education of Souro Sanou University Hospital.

The rate of recovered was 32.03% in uninfected children and 31.06% in infected children;

The lethality rate in uninfected children was 17.47% against 24.27% for infected patients. Statistical analysis showed a significant difference between the two groups for death with a RR=1,42 ; (1,05 <RR<1,93), p=0,048.

DISCUSSION

The mean age of the 231 children was 20.18 months. Our results were close to those of Somé in Ouagadougou (CHUYO) [4], who found an mean age of 21.10 months. This mean age varied according to whether the child was infected or not, but without any significant difference. The same observation was made by Beau in the Republic of Ivory Coast [5].

The sex ratio of the population of our study was similar to that of Bachou [6]. This insignificant difference between sex and type of malnutrition could be explained by the absence of genetic or anatomical factors in the occurrence of this pathology. In infected children, mean weight and mean height were significantly higher than in uninfected children. This is explained by the higher mean age of infected children compared to uninfected children.

Marasmus prevailed in the general population and more in those infected. This was pointed out by Ashrah and Tiendrebéogo (7,8). Our results were consistent with those of Sanon [9] in Burkina Faso, Mbaye in Senegal [10] and David in Asia [11]. This could be explained by immunodepression deeper in marasmus than oedematous forms as shown by the study of Bachou in Uganda [12]. This study found that children with severe marasmus had a lower CD4 count.

Infected children had more skin lesions and oral candidiasis associated with severe immunodepression. Infected children had more hepatomegaly (p=0.046). Our results were consistent with those of Sanon [9]. This could be explained by the toxicity of ARVs taken by infected children, and by anemia.

The majority of HIV-positive people were HIV1 infected and severely immunocompromised. Sanon found 95.8% of HIV 1 [9]. Mbaye et al found that HIV1 was the only type found [10].

Cotrimoxazole and antimycotics were more commonly used in infected children; this would be related to the systematic prevention of opportunistic infections [13]. The average time of CRNE follow-up was satisfactory in both groups according to the new national protocol [14]. Uninfected children had good nutritional recovery. This is explained by the fact that immunodepression, especially severe, constitutes a real problem to nutritional recovery. Infected children died more significantly; our results were similar to those of Pamela (30.4% against 8.4%, p=0.001) and also to those of Jobiba (35.4% against 10.4%, p=0.001) (15.16). This would be related to the seriousness of cases of severe acute malnutrition admitted to the center.

Conclusion

HIV significantly affects infants mortality, especially among severely malnourished children. Infected children had better nutritional recovery. Special follow-up (early screening, prevention of opportunistic infections, treatment with ARVs) would be necessary for those infected in order to reduce the high mortality observed.

Conflicts of interest : None

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