



## Hypovitaminose D Chez the Enfants of 6 to 59 Months Suffering Serious Paludisme in the Pediatria Service in CHUD-B/A in 2016

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### Abstract

**Objective:** To calculate the frequency of hypovitaminosis D in children aged 6 to 59 months with severe malaria in the paediatric ward at CHUD-B/A in 2016.

**Frame and Methods:** This is a descriptive and analytical cross-sectional study. The data collection was forward-looking. Included in the study were children aged 6 to 59 months hospitalized for severe malaria in the pediatric ward of CHUD-B/A; hiv-infected, eutrophic and who have not had vitamin D supplementation in the past 6 months. Vitamin D was boosted by the High Performance Liquid Chromatography (HPLC) technique.

**Results:** A total of 80 subjects are included in the survey. The average age was 26.08 months, the sex ratio was 0.8 and the average weight was 10.80 kg. The frequency of hypovitaminosis D was 83.8% (67 cases out of 80 children surveyed) with an average plasma concentration of vitamin D of 21.57 ng/ml - 7.34 with both extremes (11.24-42.32) ng/ml. The minimum parasitemia is 202 P/l and the maximum is 580,000 P/l.

**Conclusion:** Hypovitaminosis D is common in children with severe malaria. this result suggests that a large-scale community study should be conducted to decide whether vitamin D should be considered in national policies for supplementation and management of severe malaria.

**Keywords:** Vitamin D; Severe Malaria; Children

### Introduction

Hypovitaminosis, given the high sun in Africa in the Sub-Sahara should be exceptional. However, certain factors (dark skin colour, poor nutritional intake) may predispose children to vitamin D deficiency which, if any, may affect malaria morbidity and mortality given its role in the immune system [1-3].

The objective of this work was to calculate the frequency of hypovitaminosis D in children aged 6 to 59 months hospitalized for severe malaria in the pediatric ward of CHUD-B/A in 2016.

### Methodology

#### Goal

Calculate the frequency of hypovitaminosis D in children 6 to 59 months hospitalized for severe malaria in the pediatric ward of CHUD-B/A in 2016.

#### Framework and Methods

This is a descriptive and analytical cross-sectional study. The data collection was forward-looking. Included in the study were children aged 6 to 59 months hospitalized for severe malaria in

the pediatric ward of CHUD-B/A; hiv-infected, eutrophic and who have not had vitamin D supplementation in the past 6 months. Vitamin D was boosted by the High Performance Liquid Chromatography (HPLC) technique.

### Results

#### Frequency

From May 2016 to July 2016, eighty (80) hospitalized severe malaria cases meeting the inclusion criteria were recorded for this study. Among the eighty-eight children, sixty-seven (67) suffered from vitamin D deficiency, a frequency of 83.8% with IC [73.8-91.1]. Thus: 3.8% of these children had a severe deficit; 47.5% a moderate deficit and 32.5% a small or insufficient deficit.

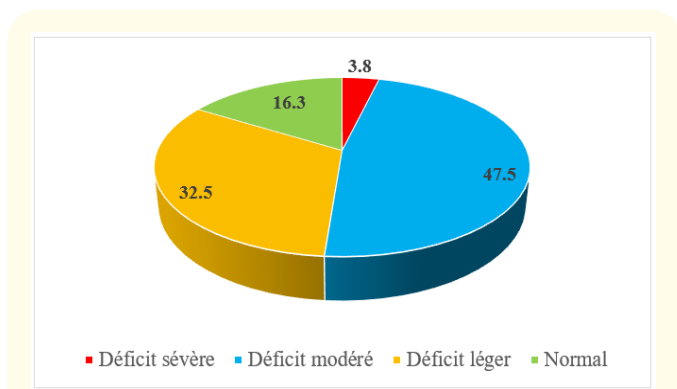
Figure 1 shows the distribution of hypovitaminosis D.

#### Socio-demographic aspects

##### Age, sex, rank in siblings

##### Age

The average age of patients in our series was 26.08 - 13.16 months and ranging from 7 months to 59 months.



**Figure 1:** Distribution of hypovitaminosis D in children aged 6 to 59 months hospitalized for severe malaria in pediatrics in 2016.

Ages	Staff	Percentage %
≤ 12	17	21,3
12 – 24	24	30,0
24 – 36	28	35,0
36 – 48	08	10,0
48 – 59	03	3,8
Total	80	100,0

**Table 1:** Distribution of children aged 6 to 59 months hospitalized for severe malaria in the paediatric ward by age group in 2016.

**Sex**

Of the eighty (80) children, forty-four (44) children were female (55%) and thirty-six (36) male (45%) and the sex ratio between boys and girls (g/f) was 0.8.

**Row in siblings**

The table shows that 37.5% of the children had the rank of siblings greater than three (03). In Table 2, the distribution of children according to their rank in the siblings is presented.

Row in siblings	Staff	Percentage %
1 <sup>st</sup>	11	13,8
2 <sup>nd</sup>	21	26,2
3 <sup>rd</sup>	18	22,5
3 <sup>rd</sup>	30	37,5
Total	80	100,0

**Table 2:** Breakdown of children aged 6 to 59 months hospitalized for severe malaria in the paediatric ward according to their rank in the siblings in 2016.

**Home, family type, education level**

The mothers of the children included resided in rural areas in 73.8% of cases, 57.5% lived in a monogamous household. 72.5% were uneducated women.

Table 3 shows the environment of residence, the type of family and the level of education.

Variables	Staff	Percentage %
<b>Mid-residence</b>		
Urban	21	26,3
Rural	59	73,8
Total	80	100,0
<b>Family type</b>		
Monogamy	46	57,5
Polygamy	34	42,5
Total	80	100,0
<b>Education level</b>		
Uneducated	58	72,5
Primary	05	6,3
Secondary	02	2,5
Higher	02	2,5
Literate without a degree	13	16,3
Total	80	100,0

**Table 3:** Breakdown of mothers or caregivers by setting of residence, family type and education.

**Behavioural aspects**

**Basic food, type of breastfeeding, duration of AME**

Mothers or babysitters had corn or mil/sorghum or yam as their staple food in 47.5% of cases. Of the eighty (80) children, 92.5% were breastfed alone and 53.8% were exclusively breastfed for a period of less than six (6) months.

Table 4 shows the distribution of the basic food, the type of breastfeeding and the duration of breastfeeding (AM).

Variables	Staff	Percentage %
<b>Basic food</b>		
Corn	22	27,5
Mil/sorghum	18	22,5
Yam	02	2,5
The three	38	47,5
Total	80	100,0
<b>Type of breastfeeding</b>		
Milk	74	92,5
Mixed (breast milk plus pharmacy milk)	06	7,5
Total	80	100,0
<b>Duration of AME</b>		
< 6	43	53,8
≥ 6	37	46,3
Total	80	100,0

**Table 4:** Distribution of children aged 6 to 59 months hospitalized for severe malaria in paediatrics by basic food, type of breastfeeding and duration of exclusive breastfeeding in 2016.

**Early breast-feeding, weaning age, complementary food type, snack type**

Of the eighty (80) children included in the study, 75% of children were not breast-feeding early, 77.5% were subjected to the family dish and only 10% had a fruit juice snack.

Table 5 shows the distribution of children included in the study based on the time it takes to breastfeed after birth, the age of weaning, the type of complementary food and the type of snack.

Variables	Staff	Percentage %
<b>Early breast-and-the-clasr</b>		
Yes	20	25,0
Not	60	75,0
Total	80	100,0
<b>Age at definitive weaning</b>		
≤ 6	11	18,3
6 – 12	06	10,0
12 – 18	21	35,0
> 18	22	36,7
Total	60	100,0
<b>Complementary food</b>		
Special	12	15,0
Family dish	62	77,5
Both	06	7,5
Total	80	100,0
<b>Snack type</b>		
Fruit juice	08	10,0
Other	72	90,0
Total	80	100,0

**Table 5:** Distribution of children aged 6 to 59 months hospitalized for severe malaria in paediatrics by delay in breast-feeding after birth, age of weaning, type of complementary food and type of snack in 2016.

**Discussion**

**La Frequency of hypovitaminosis D**

At the end of the study, the frequency of hypovitaminosis D in the CHUD-B Pediatrics department was 83.8% in children aged 06-59 months.

This frequency is similar to those reported (80%) Uganda by Sarah et al in their 2014 study of 18-month-old children with severe malaria [4].

This high frequency (83.8%) found in children in our study despite adequate sun exposure, highlighted by the average duration of sun exposure 2.34h versus 10 to 15 minutes recommended and the lack of relationship between vitamin D deficiency and duration

of exposure can be explained by the combination of several factors such as:

- Dark skin pigmentation that provides a screen against the Ultra-Violet S B rays needed for the endogenous synthesis of vitamin D. Skin pigmentation, if a protective factor against sunburn, is a major cause of vitamin D deficiency in children, due to theine Melan that absorbs UVB rays [5].
- Inappropriate diet: According to a 2014 UNICEF-BENIN study, the prevalence of acute malnutrition and chronic malnutrition in the north was 12% and 39% respectively. The source of vitamin D being also exogenous through an appropriate diet could contribute to this high prevalence of hypovitaminosis D [6].
- Recurrent infectious diseases including malaria, low respiratory infections and diarrhoea are the leading causes of infant-juvenile morbidity and mortality in our context.
- The variation in individual behaviours such as the peculiarities of clothing habits [9,10].

Other studies in children suspected of rickets by Anath et al (83.3%) respectively in their study of 06-month-old children in 2013 in Tanzania [11], by Henry et al (80%) 2015 among children aged 06 to 24 months in Uganda [12] and by Timothy et al (60%) in Malawi in 2013 in children aged 24 months [13] showed lower frequencies than in our study. Similarly in Nigeria, in 2000, Tom et al [14] regained a frequency (37%) children aged 05 to 35 months with rickets.

Because the frequency of hypovitaminosis D is higher than that found in these different studies in children suspected of rickets, one would think that malaria is more a purveyor of hypovitaminosis D in children than rickets. But also one might think that the children included in the study were deficient in vitamin D without bone manifestation before having their malaria severe or that they had a normal plasma concentration of vitamin D but exhausted by the development of severe malaria. In all cases, this result suggests that a community study should be conducted on clinically healthy children.

**Conclusion**

At the end of this work, during which we are proposed to evaluate the frequency of hypovitaminosis D in children with severe malaria in the paediatric ward at CHUD-B/A in 2016, we can remember that hypovitaminosis D is common in children with severe malaria on the cob of high sunlight and is associated with an increased likelihood of severe malaria in children.

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