Research Article

Anemia in among Children Aged 6-59 Months at the Institute of Social Pediatric (ISP) in Dakar Suburban Area

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Abstract

Introduction: Anemia is a public health problem throughout the world with disastrous consequences on the health and cognitive and socio-economic development of populations.

Objective: To study the socio-demographic, health and nutritional aspects of children aged 6-59 months with anemia followed at the pediatric social institute (PSI).

Methods: This is a cross-sectional study carried out at PSI from 1 November 2018 to 20 February 2019. Children aged 6-59 months with anemia were included.

Results: A total of 280 children had anemia among 467 who had a blood count, determining a prevalence of 59.9%. The mean age was 21.34 months 10.82 with a sex ratio of 1.52. Food diversification was started before 4 months (40.7%), between 4 and 5 months (16.1%) and from 6 months (43.2%). Cereals predominated in the diet (66.4%) followed by dairy products (59.6%). The mean hemoglobin level was 9.72±5.12 g/dl. The anemia

was mild (48.9%), moderate (48.9%) and severe (2.2%). Microcytic hypochromia was present in 92.1% of the children. Acute malnutrition was present in 9.3% of children.

Conclusion: The prevalence of anemia is high in Senegalese suburban areas. It is most often microcytic hypochromic, most probably reflecting an iron deficiency related to errors in food diversification.

Keywords: Anemia; Children; Food Diversification

1. Introduction

Anemia is a major public health problem worldwide with adverse consequences for the health, economic and social development of populations. The prevalence varies considerably between regions and population groups but remains high in developing countries. Globally, anemia affects 1.62 billion people or 24.8% of the population. In 50% of cases, it is due to iron deficiency [1]. Globally, 293.1 million (47.4%) of children under 5 years of age are anemic, of which 67.7% live in Africa [2]. In Senegal, data from the 2017 Continuous Demographic Health Survey (DHS,EDS-C) report that 71% of children aged 6 months to 59 months are anemic [3]. The objective of this study was to describe the sociodemographic, health and nutritional aspects of children with anemia in the DHS, EDS-C.

2. Methods

This was a cross-sectional study, covering the period from November 1, 2018 to February 20, 2019 at the IPS of Pikine in a suburban area of Dakar. This is a university institute under the dual supervision of the Ministry of Health and the Cheikh Anta Diop University of Dakar, with a branch located in Pikine, in the suburbs of Dakar, and a branch located in a rural area (Khombole, Thiès region) 94 km from Dakar. Children aged between 6 and 59 months who were seen in consultation and presented with pallor had a blood count. Those with anémia were included. Anemia in children under 5 years of age was defined as a hemoglobin (Hb) level below 11 g/dl. It is mild if the Hb level is between 10.0-10.9g/dl, moderate between 7.0-9.9g/l and severe between 4.0-6.9 g/dl [4]. It is microcytic if the mean blood volume (MBV) is below 80 fl, normocytic between 80-90 fl and macrocytic above 90 fl.

Hypochromia is defined as a mean corpuscular hemoglobin concentration (MCHC) below 30 g/dl and as a normochromia between 30-34 g/dl [5]. Sociodemographic data (age, sex, birth weight, term of pregnancy), health data (fever, cough and/or breathing difficulties, diarrhea, vomiting), nutritional status and diet were collected. Nutritional status was assessed by the weight-for-height (W/H) ratio. Nutritional status is normal for a W/H ratio between -2 and 2 z-scores and malnutrition was defined by a W/H ratio below -2 z-scores from the median [6]. Data analysis was performed with SPSS version 21.0 software with quantitative variables described in terms of positional parameters and qualitative variables as percentages. The $p < 0.05$ was considered statistically significant.

3. Results

3.1 Socio-demographic characteristics

During the study period, 467 children had a blood count. Of these, 280 had anemia, with a frequency of 59.9%. Males predominated with a sex ratio of 1.52. The average age was 21.34 months 10.82. The average weight of the children was 10.059 6.27 kg. The average age of the mothers was 28.73 6.12 years. The socio-demographic characteristics of the children with anemia

are presented in Table 1.

3.2 Health and nutritional characteristics

The reasons for consultation were fever (46.8%), cough (42.9%), diarrhea (21.4%) and vomiting (17.1%). Acute malnutrition was 9.3% according to the P/T ratio. The mean z-score of the P/T ratio was -0.85 ± 1.05. The mean Hb level was 9.72 4.65 g/dl. The severity and type of anemia is shown in Table 2

	Number (n)	Percentage (%)
Gender		
Male	169	60
Femal	111	40
Age groups of children (month)		
6-12	56	20
13-24	156	55, 7
25-59	68	24, 3
Term of pregnancy		
Full terme	227	81, 1
Prematurity	14	5
Post-maturity	39	13, 9
Birth Weight (gr)		
2500-3999	239	85, 4
<2500	30	10, 7
>4000	11	3, 9

Table 1: Sociodemographic characteristics of anaemic children (n=280).

	Number (n)	Percentage (%)
Severity of anemia		
Mild	137	48,9
Moderate	137	48,9
Severe	6	2,2
Type of anemia		
Microcytic hypochromic anemia	258	92,5%
Normocytic normochromic anemia	16	5,7%
Macrocytic normochromic anaemia	5	1,8%

Table 2: Severity and type of anemia (n=280).

3.3 Feeding

Of the children aged 6 to 23 months, 75.7% were breastfed. Food diversification was started before 4 months (40.7%), between 4 and 5 months (16.1%) and from 6 months (43.2%). Cereals predominated in the diet (66.4%) followed by dairy products (59.6%). Nearly half of the children (48.3%) received two cereal meals a day and 22.8% received at least three meals. The cereals were mainly millet porridge (68.9%) and locally produced cereals (35.4%). Among the children who eat the family meal (42.1%), only 34% had eaten meat, fish or eggs in the previous 24 hours. Slightly more than a third (38.3%) of the children ate vegetables and fruit.

4. Discussion

The prevalence of anemia is relatively high in the suburban area of Dakar, concerning 59.9% of children seen at the PSI. This prevalence is lower than that reported at the national level (71%) in the 2017 DHS-EDSC [4], but also at the level of some francophone countries in West Africa (72.4%) [7]. However, in some English-speaking countries in West and East Africa, slightly lower rates ranging over 50.4-58.8% have been reported [8, 9]. These rates are well above the 40% threshold set by the World Health Organization (WHO), making anemia a major public health problem [2]. The difference in prevalence observed between our study and that of the general Senegalese population could be explained by the fact that our work was carried out in the suburban areas of the capital, where socio-economic conditions are better, whereas the DHS-EDSC also concerned rural areas where the population is often confronted with problems of food availability.

Moreover, hygiene conditions are less good in rural areas, thus encouraging the recrudescence of infections such as malaria and diarrhea, which are risk factors for anemia [2]. The predominance of anemia in the 13-24 months age group is frequent and was reported in the 2017 DHS-EDSC and in a study conducted in Uganda [3, 9]. The age range between 6 and 23 months is a critical period for children. It represents a period of transition from exclusive breastfeeding to a diversified diet. The complementary diet must therefore ensure a sufficient food intake with foods containing iron which is easily absorbed (meat, fish, poultry) but also fruits and vegetables rich in vitamin C and poor in phytates which promote the digestive absorption of iron [10]. This dietary diversification is poorly conducted in most of our children (55.7%), early, with a predominance of cereal products (66.4%) and dairy products (53.2%) and poor in proteins (34%). This preponderance of cereals and dairy products and the insufficient consumption of protein-rich foods has also been reported at national level and in Benin [3, 11].

In the vast majority (92.1%) of cases, the anemia was microcytic hypochromic. Generally, microcytic hypochromic anemia is essentially due to iron deficiency. It is promoted by the lack of intake due to a diet low in easily absorbable iron, malabsorption and digestive losses due to digestive infections and inflammation [1]. This iron deficiency has been demonstrated by the good response to martial treatment of all cases of microcytic hypochromic anemia in children followed as outpatients at the Albert Royer Children's Hospital in Dakar [12]. Of the children with anemia, 9.3% were acutely malnourished. Our results are in line with those reported by the DHS, EDS-C 2017 in the general population, but also with those found in Guinea-Bissau (9.4%) [4, 13].

However, they are slightly higher than those reported in

Uganda (5.3%) [9], but much lower than those found in Benin (25.25%) [1]. The main reasons for consulting children, notably fever (46.8%), cough (42.9%) and diarrhea (21.4%), are frequent health problems in children. They were found in the 2017 DHS, EDS-C [3].

5. Conclusion

The prevalence of anemia in Senegalese children aged between 6 and 59 months is high, especially in the 13-24 months age group. It is most often of the microcytic hypochromic type, most probably reflecting an iron deficiency. In most cases, it is the consequence of poor food diversification. The fight against anemia requires the implementation of innovative strategies with the promotion of good infant and young child feeding practices, but also the strengthening of health programs for mothers and children, and a strong political commitment.

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