

Comparative Analysis of Community-Based Management of Anemia in Children before and during the COVID Pandemic

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Abstract

Introduction: In low-income countries, severe anemia represents a significant risk of mortality. It is generally the consequence of a lack of correct community-based management of mild and moderate anemia and its etiologies. Our study aimed to evaluate the community practice in confronting anemia by mothers of children aged 0 - 5 years old before and during the COVID-19 period. **Methods:** We conducted a descriptive cross-sectional study in two phases at the pediatric ward of the regional hospital of Ngaoundere in Cameroon; before the period of the COVID-19 pandemic from December 2018 to May 2019 and during the pandemic period from December 2020 to May 2021. It was a volunteer sample. Were included in this study all mothers of children aged 0 - 5 years present in the pediatric ward at the time of the survey who agreed to freely answer our questionnaire. **Results:** Of the 152 mothers surveyed in the “Before COVID-19” group, 69% went to a health facility when they suspected their children were anemic, 20% gave grenadine juice (Red colored soda), 7% went to marabouts, 2% bought street medicines and 2% used other home-made potions. Of the 92 mothers included in the “During COVID-19” group, the majority did not go to a health facility: 36% gave grenadine juice and other potions, 26% went to marabouts, 23% bought medicines from the street and only 13% went to a health facility; 2% did nothing. The average Group rank is not statistically significantly different between the before and during the COVID-19 periods ($p = 0.89$). **Conclusion:** Community behavior and practice in confronting anemia deteriorated during the COVID-19 pandemic, with the majority of mothers resorting to non-effective out-of-hospital solutions. The consequence can be an increase in infant mortality. While waiting for

the end of the pandemic, it is judicious and urgent to review the whole health system in Africa and especially in countries with limited resources. We propose developing multiple advanced strategies to promote community visits to prevent anemia and to develop anticipatory management of anemia as well as all the main child-killing pathologies.

Keywords

Anemia, COVID-19, Community, Management

1. Introduction

Anemia is a major public health problem in the world with negative consequences on human health [1] [2]. Severe anemia is a major cause of death in children under five in resource-limited countries. For children aged 0 - 5 years, the percentage of deaths due to anemia is high in highly malarious areas of Africa (Sierra Leone 11.2%, Zaire 12.2%, Kenya 14.3%) [3]. A preliminary survival analysis of a cohort of infants in Malawi indicated that if hemoglobin falls by 10 g/L at 6 months of age, the risk of death is 1.72 times higher than those with higher hemoglobin [3]. It is a consequence of a failure to properly manage mild and moderate anemia and its etiologies in the community [3] [4]. For proper community management of anemia and other childhood diseases, a health system has been established to promote proximity of evaluation and treatment to the community, and to anticipate the management of various health problems of children. The COVID-19 pandemic has disrupted all aspects of service delivery and clinical planning [5]. Abdoulaye *et al.* in Niamey reported that the COVID-19 pandemic has a negative impact on the provision of services to the most at-risk groups of the population, namely women and children [6]. The weakness of the health care system on the African continent distinguishes it from other continents that have experienced COVID-19 so far [7]. We conducted a study to assess community management of anemia by mothers of children aged 0 - 5 years before and during the COVID-19 pandemic.

2. Method

A descriptive cross-sectional study was carried out in the pediatric department of the regional hospital of Ngaoundere in Cameroon (Central Africa). It was spread over 12 months and divided into two phases of 6 months as follows: the first study was carried out 6 months before the COVID pandemic in order to assess the community management of anaemia by mothers of children. With the COVID pandemic, we proposed to reassess this attitude for another 6 months and identify changes. Before the COVID-19 period from December 2018 to May 2019 and during the COVID-19 period from December 2020 to May 2021. We aimed to describe the attitudes and practices of mothers when anemia was suspected in their children and to determine the difference in attitudes between the

periods before and during the COVID-19 pandemic. It was a volunteer sample. We used simple random sampling. The Lorenz formula was used for sample size calculation. Were included in this study all mothers of children aged 0 - 5 years present in the pediatric ward at the time of the survey who agreed to freely answer our questionnaire. We assessed: their knowledge of anemia (definition, ability to recognize anemia and the causes) and their attitudes (medication or home care) in the face of anemia. The research was conducted in compliance with ethical and administrative formalities. The anonymity and confidentiality of the respondents were respected. A questionnaire was used as an interview guide, filled out either directly by the mothers or by a health care worker who assisted uneducated mothers. In order to ensure the reliability and validity of our questionnaire, we carried out a pre-survey on 10 mothers of children aged 0 - 5 years. We assessed: their knowledge of anaemia, (definition, ability to recognize anaemia and causes) and their attitudes (use of medication or home management) towards anaemia. Data were collected and then analyzed on Excel 2016 software (Microsoft Corporation, Redmond, USA). Quantitative data are expressed as means or medians while qualitative data are expressed as frequency. As the numbers compared were small, a non-parametric test was performed (Paired Mann-Whitney test).

3. Results

Socio-demographic profile of participants

Before the COVID-19 period, 152 mothers agreed to answer our questionnaire; during the COVID-19 period, 92 mothers agreed. In both groups, the majority of the mothers were between 19 and 35 years old, married with primary school education, Muslim and housewives (**Table 1**).

Mothers' knowledge of anemia

The majority of mothers in both groups (82% in the "Before COVID-19" group and 55% in the "During COVID-19" group) gave a good understanding of anemia. Further, the number of mothers with anemic children was higher in the "During COVID-19" group, 59%, compared to 38% in the "Before COVID-19" group.

Mothers' attitudes towards anemia

Of the 152 mothers surveyed in the "Before COVID-19" group, 69% went to a health facility when they suspected their children were anemic, 20% gave grenadine juice (Red colored soda), 7% went to marabouts, 2% bought street medicines and 2% used other home-made potions. Of the 92 mothers included in the "During COVID-19" group, the majority did not go to a health facility: 36% gave grenadine juice and other potions, 26% went to marabouts, 23% bought medicines from the street and only 13% went to a health facility; 2% did nothing (**Table 2**). The average Group rank is not statistically significantly different between the before and during COVID-19 periods ($p = 0.89$) (before ($n = 5$) 11.0 [3.00; 30.0] after ($n = 5$) 21.0 [12.0; 24.0], Mean: -12.4, $n = 5$, $P = 0.89$, Test: Paired Mann-Whitney). The COVID-19 epidemic has not significantly changed the attitude of mothers. It is important to remember that the 2 groups have the same epidemiological

Table 1. Socio-demographic profile of mothers.

Socio-demographic profile of participants	Group before COVID-19 N = 152	%	Group during COVID-19 N = 92	%
Age of Mothers				
<18 years	44	29%	19	21%
19 - 35	84	55%	55	60%
>35	24	16%	18	20%
Marital status				
Single	43	28%	18	20%
Married	102	67%	64	70%
Divorced	6	4%	6	7%
Widow	1	1%	4	4%
Level of study				
Not in school	43	28%	13	14%
Primary	51	34%	40	43%
Secondary	24	16%	25	27%
University	34	22%	14	15%
Religion				
Muslim woman	94	62%	48	52%
Christian	58	38%	41	45%
Other		0%	3	3%
Mother's occupation				
Housekeeper	81	53%	45	49%
Shopkeeper	18	12%	25	27%
Student	16	11%	17	18%
Public servant	18	12%	5	5%
Other	19	13%	0	0%

Table 2. Mothers' attitudes towards anaemia.

Mothers' attitudes towards anaemia	Group before COVID-19 N (%)	Group during COVID-19 N(%)	P-Value (Test Paired Mann-Whitney)
Bringing the child to the marabout	11 (7)	24(26)	0.89
Take the child to the hospital	105 (69)	12(13)	
Give him the grenadine juice	30 (20)	33 (36)	
Buy the medicine from the store	3 (2)	21(23)	
Other decoctions (Tomato, milk, beetroot etc)	3 (2)	0 (0)	

characteristics (the age of the mothers, their profession, their marital status and religion) the only difference is in the number of mothers which is low during the COVID-19 period.

During the study, we corrected the wrong answers of the mothers and the sick children were treated.

4. Discussion

The identical socio-demographic profile in both groups eliminates any bias in the interpretation of mothers' attitudes. A low number of participants in the "During COVID-19" group highlight the low hospital attendance by mothers during the pandemic which may lead to a bias in the interpretation of the results.

A significant drop in the use of curative services at the level of all health districts in Niamey was reported in the second quarter of 2020 [6]. With no treatment available for COVID-19 at that time, the hospital was perceived more as a place of risk than a health care facility. This encourages people not to go to the hospital, but rather to take care of themselves at home [8] [9].

The presence of more anemic children in households during the COVID-19 pandemic reinforces the idea that since the first case of the coronavirus disease was reported, there has been a decline in the use of services in most health facilities. This may undermine the efforts made so far to anticipate and prevent childhood diseases and increase the number of out-of-hospital deaths related to other diseases [10].

Community management of anemia has deteriorated during the COVID-19 pandemic. Although the statistical test is not significant, probably due to the small number of participants, we note that the mothers of the children turned more to ineffective self-medication of very poor quality putting at risk the life of the anemic child. The WHO has recently developed guidance for countries on how to ensure safe access to essential health services during the pandemic [11]. The response to the global pandemic has disrupted all aspects of service delivery and clinical planning in the health system. Countries have yet to make important decisions to deal with COVID-19; this is already affecting access to care for other health problems [12]. COVID-19 is taking all the media attention and aggregating all international funding to the detriment of real African public health priorities like malaria, diarrhea, and AIDS [13]. The preventive, curative and palliative care programs for these diseases have been disrupted by the COVID-19 pandemic [14]. Malaria remains the leading cause of anemia in sub-Saharan Africa. In a group of 95 children aged 6 months to 2 years living in a rural area of Côte d'Ivoire, 80% of whom were anemic; the risk of anemia was 8 times greater in the event of infestation by *P. falciparum* [15] [16]. In light of this situation, African policymakers and governments need to develop health. Strategy for COVID-19 that is specific to their continent. This includes extending education and prevention measures to the entire population. Africa must take the lead in its fight against COVID-19 and deploy solutions adapted to its epidemiological

realities and resources [9]. It should lay the groundwork for a profound restructuring of the health system that will improve the management of public health emergencies in the long term. This study has some limitations such as the small number of participants during the COVID-19 period.

5. Conclusion

Community behavior and practice confronting anemia deteriorated during the COVID-19 pandemic: mothers resorted to out-of-hospital solutions. The consequence can be an increase in infant mortality. While waiting for the end of the pandemic, it is advisable to develop multiple advanced strategies in order to provide anticipatory management of anemia in the community. It is also advisable for the African health system to improve community behavior in preventing other serious childhood diseases.

Conflicts of Interest

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

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