Prevalence of anemia and associated risk factor among under-five children in Asella Teaching and Referral Hospital, Arsi University, Asella, Ethiopia

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Abstract

Anemia is a decrease in the total amount of red blood cells (RBCs) or hemoglobin in the blood or both which results in a lowered ability of the blood to carry oxygen. According to a 2008 WHO report indicate that more than half of the world's preschool-age children (56.3%) reside in countries where anemia is a severe public health problem. In sub-Saharan Africa, it is a severe public health problem among preschool-age children. In this region, much of the national prevalence is estimated to be above 40% among this age group. In Ethiopia, more than 44% of under-five children are anemic. Furthermore, a 2016 report national-level indicates even there was intervention the prevalence increased significantly to 72.3%. It means that the prevalence of anemia is still at the highest public health problem in Ethiopia. The Objectives of the study is to assess the prevalence of anemia and associated factors among under-five children attending the pediatrics outpatient department in Asella teaching and referral Hospital from June 2018 to October 30, 2018. An Institutional based cross-sectional study was conducted by non-probability convenience sampling technique; 338 children were selected. The results of the study showed that the overall prevalence of anemia among under-five children was 36.7%, around 21(6.2%) of them were found to be severely anemic, whereas 37 (10.9%) were moderately anemic. Factors like child's age [AOR=2.36, 95%CI (1.18, 3.74)] and birth intervals [AOR=3.31, 95%CI (1.17, 3.6)], were associated with anemia. Anemia remains a common health problem in the study area among under-five children and further studies are needed to focus on etiologies and interventions.

1. Background

Anemia is a decrease in the total amount of red blood cells (RBCs) or hemoglobin in the blood [1, 2] or both which result in a lowered ability of the blood to carry oxygen [3]. The three main types of anemia are due to blood loss, decreased red blood cell production (e.g. iron deficiency Anemia), and increased red blood cell breakdown [4]. Iron deficiency anemia in young children is recognized as a major public health issue and the most prevalent form of micronutrient deficiency worldwide. Which is defined as a hemoglobin level of <11g/dl [5]. A full blood count (FBC), also known as a complete blood count, is one of the most frequently requested blood tests to investigate anemia [6].

According to the 2008 WHO report indicate that more than half of the world's preschool-age children (56.3%) reside in countries where anemia is a severe public health problem [6]. In sub-Saharan Africa, it is a severe public health problem among preschool-age children[7]. In this region, much of the national prevalence is estimated to be above 40% among this age group [5].

In Ethiopia, more than 44% of under-five children are anemic. Furthermore, a 2016 report national-level indicates even there was intervention the prevalence increased significantly to 72.3%. It means that the prevalence of anemia is still at the highest public health problem in Ethiopia [8].

This study aimed to investigate the prevalence of Anemia among under-five children in Asella Referral and Teaching Hospital since there was no published data in this study area and also this study will be

helpful for caregivers for evidence-based intervention and creating awareness for the health professionals working in pediatrics department farther more it helps as baseline information for further large scale study.

Hence this study was conducted to assess anemia and associated factor among pre-school age children and the information obtained from the study might be contributing to design effective intervention strategies in the study area by the concerned body.

2. Methods

2.1 Study design and area

The study was conducted at Arsi Zone Asella town in Asella referral and teaching hospital. Asella is Located in the Arsi Zone of the Oromia Region about 175 kilometers from the capital Addis Ababa. The institutional-based cross-sectional study design was employed to assess the magnitude of anemia and associated factor among under-five from June 2018 to November 2018

2.2 Study population and sampling procedure

A total of **338** children within study time until sample size fulfill based upon inclusion criteria from those coming to the laboratory from September 26 / 2018

2.3 Data Collection and Statistical Analysis

The raw data was entered and analyzed by SPSS version 20. Percentage and frequency were used to show the distribution of descriptive data using tables. Bi- variant logistic regression analysis was employed using a model for further analysis and interpreted based on the odds ratio and level of statistical significance at p-value <0.05.

3. Result

3.1 Socioeconomic and Demographic Characteristics of a Family

A total of 338 children aged 6–59 months with their mother's/care givers were included in the study. Thirty-seven percent 126 (37.3%) of mother's/care giver attended their education only up to elementary school and 46.7% of fathers have attended their education diploma and above.

Around 22% of participants' families had the lowest monthly income which was less than 1000 Ethiopian Birr (table 1).

Table 1. Sociodemographic of participants' family in Asella teaching and referral Hospital Asella, Oromia, Ethiopia, October 2018 (n=338).

Variable	Frequency	Percent (%)
Residence of child family		
Urban	171	50.6
Rural	167	49.4
Education status of Father		
Illiterate	9	2.7
Elementary	76	22.5
Secondary	96	28.4
Diploma and above	157	46.4
Education status of Mother		
Illiterate	25	7.4
Elementary	126	37.3
Secondary	104	30.8
Diploma and above	83	24.6
Occupation of Father		
Merchant	52	15.4
Farmer	136	40.2
Civil servant	150	44.4
Occupation of Mother		
Housewife	201	59.5
Merchant	71	21
Civil servant	66	19.5
Monthly income of family		
<1000	76	22.5
1000-2000	11	3.3
2000-3000	60	17.8
>3000	91	56.5
The birth interval of mother		
< 2 year	73	21.6
> 2 year	265	78.4

3.2 Demographic Characteristics and Nutritional Status of Children

Out of 338 study participants, 142 (42%) were males and the majority of the children were 24-59 months old 101(29.9%) (Table 2).

Table 2. Demographic Characteristics of under-five children in Asella teaching and referral Hospital Asella, Oromia, Ethiopia, October 2018 (n=338).

Variable	Frequency	Percent (%)
Age		
6 Month	91	26.9
6-11 Month	83	24.6
12-23 month	63	18.6
24-59 month	101	29.9
Sex of child		
Male	142	42
Female	196	58
Malnutrition status of a child		
Normal	141	41.7
Mild malnutrition	160	47.3
Severe malnutrition	37	10.9
Body mass index of child		
Normal	119	35.2
Underweight	211	62.4
Obese	8	2.4
Total time of Breastfeeding of child		
6 only month	64	18.9
up to 1 year	194	57.4
up to 2 year	80	23.7

3.3 The magnitude of Anemia among Children

According to our study 123(36.7%) were anemic and from those around 21(6.2%) of them were found to be severely anemic (Chart 1).

4. Risk Factors

Children aged 6-11 months were more anemic than the other which was 45.8% and prevalence relatively decreased in children aged 24-59 months. Accordingly, children of age 6-11 month were two times more likely of developing anemia than those of children 24-59 months. Male children are 2.4 times at risk of being anemic than female children's and the birth interval is also a significant risk factor for anemia (Table.3).

Table 3. Associated factors anemia among children aged 6-59 months in Asella referral and teaching hospital Asella, Oromia, Ethiopia, 2018(n=338).

Variables	Anemic status		
	Number (%)	Adjusted OR (95% CI)	P-Value
Age of child in a month			
<6	35 (28.5)		
6-11	83 (30.9)	2.36 (1.18, 3.74)	0.005
12-23	23 (18.7)		
24-59	27 (22.0)		
Sex of child			
Female	56 (45.5)		
Male	67 (54.5)	2.4 (1.23, 3.65)	0.001
Stunting			
Yes	60 (48.8)	1.4(0.71, 2.89)	<0.005
No	63 (51.2)		
Wasting			
Yes	57 (48.8)	2.00(1.90, 3.66)	<0.005
No	66 (51.2)		
The birth interval of Mother			
< 2 year	40 (32.5)	3.31 (1.17, 3.6)	0.001
> 2 year	83 (67.5)		
Malaria positive			
No	115(93.4)		
Yes	8(6.5)	1. 1.00, 1.40)	>0.05

5. Discussion

Anemia is considered the most prevalent nutritional deficiency globally, affecting about a quarter of the world population, especially children and women of reproductive age. In children, anemia can negatively affect cognitive development, school performance, physical growth, and immunity. Nowadays, the changing nutritional scenario of children less than five years of age has been evaluated globally, revealing a tendency towards dramatic reductions in the undernutrition for this age group. This trend has been attributed to improvements in education levels and family socioeconomic conditions, as well as public investments in infrastructure, health, and sanitation. Nevertheless, similar improvements have not been observed concerning child anemia. According to recent studies, about one-fifth of children under five years of age are anemic[9, 10].

This study evaluated 338 under-five children subjects overall. The population studied was predominantly female who cover 58% of the participants with a male to female ratio of 1:1.4. In our study we have found prevalence of anemia 36.4% which was much lower than EDHS 2016 findings, (57%)[8], Brazil (56.6%) [11], Ghana (78.4%)[12] and which is near to the prevalence of Tigray (37.3%) [13], Haiti (38.8%) [14] Cameron (37%)[15]. Our finding is higher than in Gondar (28.6%) [16], Pakistan (33.2%) [17], India (29.7%)[18].

Prevalence of anemia reported from several developing countries varied. As different studies indicate in Africa and other developing countries insufficient dietary of iron is considered which primary cause of anemia was. The possible reason for this discrepancy of anemia might be due to deficiency in Iron nutritive among under-five children associated with poor food availability and cultural behaviors. In developing countries.

Sex of child also shows statistically significant association with child anemia which was male children are 2.4 times more likely anemic than female. The influence of gender on anemia shows conflicting results. Many studies found no association between anemia and gender whereas other authors reported that anemia is more common in boys. An association with boys may be due to the faster growth of pre-school boys compared to girls, which results in a high iron demand that cannot be met by diet alone. However, further studies are necessary to better understand this factor. If this physiological state is not compensated with appropriate and iron shortage of iron in the body Cause of IDA anemia

Other factors that were assessed to be associated with child anemia were the childbirth interval of the parent. Our study shows that childbirth is less than 2 years from the last child and was 3.31 times more likely to be anemic than childbirth interval greater than 2 years.

6. Conclusion And Recommendation

Anemia was found to be a moderate public health problem (36.7%) among children aged 6–59 months who attended in Asella referral and teaching hospital. It was established that the occurrence of anemia is directly correlated with parents' income and maternal literacy status. Childs' age, birth intervals, sex of the children, being stunting and wasting, infected with malaria parasites were associated with anemia.

Therefore, appropriate and tailored interventional strategies are required to reduce the prevalence of childhood anemia. These include improving providing health education on child Brest feeding practices and complimentary food and also birth interval of the child must be adjusted until the child starts other complementary food other than Breast milk only.

Declarations

Ethical considerations

Ethical clearance was obtained from the Arsi University ethical review and research committee. This study is conducted in Arsi University and ethical clearance is taken from Arsi University ethical review committee before conducting this study. Oral consents were taken from parent's/care giver after creating awareness about the objective, benefit of the study, individual's rights.

Conflict of Interests

The authors declare that they have no competing interests.

Acknowledgment

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Competing interests

The authors declare no competing interests.

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Figures

Figure 1

Chart 1. The degree of anemia among children aged 6–59 months based on Hgb level in Asella referral and teaching hospital Asella, Oromia, Ethiopia, 2018(n=338).