Anemia among Children Aged 1 month -12 Years at Al-Wahda Hospital,Derna-Libya

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Abstract: Anemia is one of the main public health issues among children in the world. The causes of anemia are multifactorial, but iron deficiency is the most common one**.** There are direct proportions between iron and body mass. The paper aimed at determining anemia prevalence in children aged 1-144 months in Al-wahda Hospital in Derna city during the first quarter of 2017, as well as determining the type of anemia. A sample of 129 children aged 1-144 M was tested for hemoglobin levels to diagnose anemia. Mean corporal values were measured to determine the type of anemia, and data were collected based on independent variables such as age and sex. The frequency was created, and comparisons were tested using chi-square. Anemia prevalence of overall sample was 65.11%. It was significantly higher in children aged (1-3 months) than those aged (4-6 months), and (7-144 months) (p =.001). Significant differences were found in anemia prevalence among boys and girls, where prevalence was higher in girls than in boys (P=.008). Prevalence of Microcytic hypochromic anemia was higher (69.4 %) compared to Normocytic normochromic (28.57%), and Macrocytic hyperchromic anemia (2.38%). Prevalence of anemia of the overall sample is considered as sever based on World Health Organization anemia classification. In addition, increased anemia prevalence in children less than 3 months shud be taken care of the Libyan government to prevent and control anemia in pregnant women. The high prevalence of Microcytic hypochromic in the overall sample was observed. Further estimation of iron and ferritin should do, and further evalution is needed to identify the causes of anemia in children under 12 years

Keywords: Anemia, children, Derna**.**

INTRODUCTION

Anemia remains a public nutritional problem throughout the world (Habib et al., 2016; Ngesa & Mwambi, 2014). There are >1.5 billion people affected by anemia worldwide (Li et al., 2017). Anemia is common in infants young children-, and pregnant.(Li et al., 2017). Prevalence of anemia in children under 5 years is 24% in developing countries (Li et al., 2017).

Most children with anemia are asymptomatic. Anemia is classified as microcytic, normocytic, and macrocytic based on the mean corpuscular volume. The etiologies of anemia are multifactoral. The most prevalence form of anemia throughout the world is iron-deficiency anemia, it is estimated as 50% of anemia cases worldwide, and it particularly affects women and children.

Iron is an essential mineral in infancy where it plays a significant role in the stages of neurogenesis and cell differentiation in various areas of the brain (Al-Qaoud, Al-Shami, & Prakash, 2015; Pita et al., 2014).

There is a direct proportional between iron and body mass, so infants with low birth weight have less total iron than infants with normal

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birth weight. This may lead to irreversible body development including that for the brain and may lead to serious problems such as cognitive, motor, and behavioral problems (Al-Qaoud et al., 2015; Li et al., 2017).

WHO has developed a classification system to facilitate international comparisons of anemia as a public health problem. The problem is considered severe if anemia prevalence is $\geq$ 40%, moderate from 20 to 39.9%, and mild from 5 to 19.9% (Pita et al., 2014).

Hemoglobin may not always be the most appropriate indicator for anemia because of its low sensitivity to iron deficiency and individuals health. Since iron, deficiency is only one of many disorders that can cause anemia.

In Libya, as in many other developing counties, hemoglobin levels can be an appropriate, inexpensive, and simple indicator of both iron status and anemia (Pita et al., 2014).

The objective of our research was to determine the prevalence of anemia in children under 12 years who were admitted to Derna's Al-wahda hospital and to determine which type is more common to provide more insights to the nature and types of policies that we can put up to prevent and treat anemia.

MATERIALS AND METHODS

The research was conducted in the period from January-March 2017. 129 children under 12 years, who were admitted to the pediatric department of Al-wahda hospital in Derna city, were included in this study.
5ml of blood were collected from all children in EDTA containers. By using automated cell counter (SYSMEX 21), hemoglobin and RBC indices were estimated.

The dependent variable was anemia, Mean corpuscular volume, and the independent variables were sex and age (Table1).

RESULTS

Eighty-two children of 129 (65.11%) were anemic.

Table (1). Study variable

Variable	Category
Age group (months completed)	1-3
	4-6
	7-12
Sex	Male, Female
Anemia	-1-3 months
	Yes: Hb <16µg/dl
	No: Hb>16 µg/dl
	-4-6 months
	Yes: Hb<9 µg/dl
	No: Hb>9 µg/dl
	-7-144months
	Yes: Hb<12 µg/dl
	No: Hb>12 µg/dl

The mean level of hemoglobin concentration was 13.04 (SD = 11.94) ranging from 12.9 g/dl (SD=2.65) in the group aged 1-3 months, to 11.094 in the group aged (7-144 months), to 10.47 in age group 4-144 months.

The prevalence of anemia was significantly high among children aged 1-3 months than those observed in the group aged 4-6 months and the group aged 7-144 months (P=.001) (Table 2).

Table 2. Prevalence of anemia according to age

Age (months)	Children tested	Anemic children	Percentage of anemic children
1-3	20	16	80%
4-6	9	1	11.11%
7-144	100	65	65%

Female children were found to have a higher prevalence rate than male children (P =.008) (Table 3).

Table 3. Prevalence of anemia according to sex

Sex	Children tested	Anemic children	Proportion of Anemic Children
Female	72	54	75%
Male	57	28	49.12%

According to Mean Corpuscular Volume (mean 78.57, SD=11.9), Microcytic hypochromic anemia was higher than both Normocytic normochromic and Macrocytic hypochromic anemia (Table 4).

Table 4.Prevalence of anemia by mean corpuscular value.

Anemia type	Tested children	Anemic Children	Percentage
Microctic Hypochromic	82	57	69.51%
Normocytic Normochromic	82	23	28.04 %
Macrocytic Hyperchromic	82	2	2.38%

DISCUSSION

The present study showed that the overall prevalence of anemia among hospitalized children was 65.11%. This rate is markedly higher than the prevalence data reported by industrial countries such as Austria 10.5% and Belgium 8.7%. However, it is still lower than the prevalence data reported by south Asian countries such as India 74.3% (Al-Qaoud et al., 2015).

The distribution of anemia by age in the present study showed that in the prevalence rate was high in group aged 1-3 months than other groups. This results were consistent with findings from other study in other countries (Li et al., 2017). Increased anemia prevalence in group aged 1-3 months could be due to the low hemoglobin level in the mother during pregnancy. This was consistent with a study in

Brazil which found that one of the factors contributing to low levels in a child was maternal anemia, highlighting the need to prevent anemia before, during, and after pregnancy (Pita et al., 2014).

Boys are reported to be more susceptible to iron deficiency than girls due to their more rapid growth in the first months of life (Pita et al., 2014), but this was inconsistent with our finding where the prevalence was significantly higher in girls than in boys.

The present study showed a high prevalence rate of Microcytic hypochromic anemia among anemic children. This result is consistent with World Health Organization which shows that iron deficiency is the most common cause of anemia (Pita et al., 2014).

CONCLUSION

Based on World Health Organization classification of anemia, the prevalence of anemia in our study is considered as severe (> 40). Anemia prevalence in group aged 1-3 months was high compared with those aged 4-6 months and 7-144 months. There was an Increased prevalence of Microcytic Hypochromic anemia of overall anemic samples. Further research is needed to know the exact causes of anemia in children under 12 years among this area. We recommend taking more action to control anemia in women of childbearing age.

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ETHICS

Ethical approval was granted from the research and ethics committee of the college, and

consent was gotten from all participated patients.

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الأنيميا في الأطفال الذين تتراوح أعمارهم ما بين شهر إلى 12 سنة في مستشفى الوحدة بمدينه درنة-ليبيا

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المستخلص: الأنيميا هي إحدى المشاكل الصحية الأساسية المنتشرة في الأطفال في العالم. هناك عدة أسباب للأنيميا لكن يبقى نقص عنصر الحديد واحدا من أهم مسببات الأنيميا كما أن هناك علاقة مباشرة بين عنصر الحديد ووزن الجسم. هذه الورقة قد أجريت لتحديد انتشار الأنيميا في الأطفال الذين تتراوح أعمارهم بين (شهر-144 شهرا) في قسم الأطفال في مستشفى الوحدة في مدينة درنة في ربع الأول من سنة 2017، بالإضافة إلى تحديد نوع الأنيميا الأكثر انتشارا، عدد أفراد العينات129 طفل تتراوح أعمارهم بين شهر-144 شهرا قد شاركوا في هذه الدراسة. مستوى الهيموجلوبين قد قيس لتشخيص الأنيميا كما أن البيانات قد جمعت على متغيرات مستقلة مثل العمر والجنس. كما أنه قد تم استخدام بعض الإختبارات الإحصائية (Frequency comparisons tests chi square)، انتشار الأنيميا لكل العينات المشاركة كانت بنسبة (65.11%). الأنيميا في الأطفال الذين تتراوح أعمارهم بين(شهر-3شهور) كانت الأكثر انتشارا مقارنة بالفئتين العمريتين الآخريين (4شهور -6 شهور) (7شهور-144 شهرا)(p=.001). كان هناك ارتفاع ملحوظ في انتشار الأنيميا في جنس الإناث من الأطفال مقارنة بجنس الذكور من الأطفال (p=.008). كما أن هناك ارتفاعاً ملحوظاً في نسبة نوع الأنيمياMicrocytic Hypochromic (69.4%) ثم تليها Normocytic Normocromic بنسبة (28.27%) ويأتي نوع الأنيميا Macrocytic Hyperchromic كأقل انتشارا بنسبة (2.3%). نسبة انتشار الأنيميا في العينات المشاركة حادة طبقا لتصنيف منظمة الصحة العالمية World Health Organization. بالإضافة إلى أن الأنيميا في الفئة العمرية (1 شهر-3 شهور) كانت أكثر انتشار وذلك مما يستوجب على السلطات المحلية محاولة منع الأنيميا أو التحكم فيها بالنساء الحوامل. ارتفاع نسبة انتشار نوع الأنيميا Microcytic Hypochrimic لكل العينات المشاركة تجعل من الضروريّ قياس ferretin and iron.لابد من دعم دراسات أخرى لتحديد أسباب انتشار الأنيميا في الأطفال بصفة عامة وفي مدينة درنة بصفة خاصة.

الكلمات المفتاحية: أطفال، أنيميا، درنة.

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