

Original Research Article

Haematological Issues on Anaemia Prevalence Among Less Than Ten Years Old Children Patients Attending Rongo Sub-County Hospital, Kenya

Yambo, Elizabeth Onyango

Department of Medical Laboratory Science, Mount Kenya University, Kisii Campus Kenya

***Corresponding Author:**

Yambo, Elizabeth Onyango

Email: elizabethyambo@gmail.com

Abstract: The purpose of the study was to determine anemia prevalence on less than ten years old children patients' attending Rongo sub-county hospital, Kenya. The country has experienced rapid economic growth over the last few decades, significant health and nutritional problems remain. Unfortunately, because little work has been done to track basic diseases, such as iron-deficiency anemia, the exact problem of these health problems still remain unknown. The study comprise 250 parents, 7 medical laboratory technologists/technicians, 1 medical superintendent 1 hospital administrator. The study adopted hospital based cross sectional survey design. Since the hospital is one, there is one medical superintendent and an administrator; purposive sampling was used to select them as they were few. Due to the fact that there are 250 parents of anemic children attending the hospital 30 percent of them was considered hence 75 parents/guardians. The study used questionnaire. The actual data collection, a pilot study was conducted in the same county among the parents of less than ten years old attending Minyanya health centre which was not included in the final study population. From this health centre where 10 parents were randomly selected for the pilot study, 3 medical laboratory technologists, and their respective hospital administrator and medical superintendent. A minimum correlation coefficient of 0 .65 is recommended and considered reliable. Data was analyzed using descriptive statistics by means, percentages and frequency distribution tables. Obtained data was also analyzed, synthesized and presented using statistical package of social sciences (SPSS) version 20. The study found that that 68 percent of children of ages 7-24 months were mostly affected. The effect of anemia was found that headache and dizziness was 94.7 percent. The study concluded that most children have been blood transfused, Malaria test was mainly positive and children of ages 7-24 months were mostly affected. The research recommended that hospitals should be stocked with enough blood because most children have been blood transfused, more precaution should be taken because malaria test was mainly positive in the hospital and children of ages 7-24 months were mostly affected hence more parental/guardian awareness be encouraged.

Keywords: Kenya, anemia, Prevalence, children, patients.

INTRODUCTION

Studies done in Britain by Bliss [1] defined anaemia as condition in which the red blood cells (erythrocytes) are reduced in number or volume or are deficient in hemoglobin, their oxygen-carrying pigment. The most noticeable outward symptom of anemia is usually pallor of the skin, mucous membranes, and nail beds. Symptoms of tissue oxygen deficiency include pulsating noises in the ear, dizziness, fainting, and shortness of breath [2]. Compensatory action of the heart may lead to its enlargement and to a rapid pulse rate. There are close to 100 different varieties of anemia, distinguished by the cause and by the size and hemoglobin content of the abnormal cells. The treatment of anemia varies greatly, depending on the diagnosis. It includes supplying the missing nutrients in the deficiency anemia, detecting and removing toxic factors, improving the underlying disorder with drugs

and other forms of therapy, decreasing the extent of blood destruction by methods that include surgery (like splenectomy), or restoring blood volume with transfusion.

Studies done by Villalpando, Shamah-Levy, Ramírez-Silva, Mejía-Rodríguez and Rivera [3] in Mexico on evaluation of hemoglobin levels, which was conducted among 5,397 children, this was 88.1% of the total sample. The finding revealed that the overall prevalence of anemia was found to be 51.2%. Further, higher risk of presenting anemia was documented for boys, lower maternal schooling, lower household socioeconomic status, poorer sanitary conditions, presence of maternal anemia, and anthropometric deficits. Regional differences were observed, with the highest rate being observed in the North. Similarly, Lutter [4] and Villalpando *et al.* [3] concluded that the

prevalence rates of anemia in indigenous children were approximately double than those reported for non-indigenous Brazilian children in the same age group. Consequently, notable differences in the occurrence of anemia in indigenous and non-indigenous children have been reported for other countries. Deeper knowledge about the etiology of anemia in indigenous children in Brazil was essential to its proper treatment and prevention. Given the multifactorial nature of this disease, correcting anaemia often requires an integrated approach. In order to effectively combat it, the contributing factors must be identified and addressed. In settings where iron deficiency is the most frequent cause, additional iron intake is usually provided through iron supplements to vulnerable groups; in particular pregnant women and young children. Report by WHO [5] pointed out that food based approaches to increase iron intake through food fortification and dietary diversification are important, sustainable strategies for preventing IDA in the general population. In settings where iron deficiency is not the only cause of anaemia, approaches that combine iron interventions with other measures are needed. In Cuban research by Brabin, Premji and Verhoeff [6] had a divergent opinion on hemoglobin and iron deficiency when they argued that depending on the type of nutritional problem at issue, hemoglobin may not always be the most appropriate indicator for anemia, due to its low sensitivity to iron deficiency (hemoglobin levels often overlap in iron-deficient and healthy individuals). Its specific utility is also poor, since iron deficiency is only one of many disorders that can cause anemia. Despite this constraint, in Cuba, as in many developing countries with high prevalence of iron deficiency, hemoglobin levels can be an appropriate, inexpensive and simple indicator of iron status and anemia.

In Africa, a research in Nigeria by Muoneke, Ibekwe, Nebe-Agumadu, and Ibe [7] and in Ghana by Koram, Owusu-Agyei, Utz, Binka, Baird, Hoffman and Nkrumah [8] added that severe anemia is a common blood disorder in children from developing countries. Mortality rates from severe anemia are high in these regions with high levels of poverty, infections and malnutrition in addition to the problems of inaccessible and poorly funded health facilities. Urgent blood transfusion is generally the mainstay of treatment however, despite blood transfusion, a number of children with severe anemia still die. They conducted this study to improve their understanding of the probable risk factors associated with poor outcome in children with severe anemia. Anemia has been a major public health problem in developing countries including Kenya. This therefore, calls for appropriate policy framework in combating it within. According to Sawe [9] and Yambo [10] it is the prerogative of governments' policymakers, program planners and other non-governmental organizations to be well informed of the high prevalence of anemia. What is widely unknown is the prevalence within specific socio

demographic subgroups as well as sub-regional areas with specific needs. Due to this lack of information, directing the limited resources to the appropriate target areas is mostly a challenge and a contributing factor to missing the target population. Furthermore, identifying the specific variables associated with anemia is relevant in prioritizing interventions and revealing patterns for improved results. In the present Kenya, the Ministry of Health has laid out policy on Iron supplementation to all women attending antenatal clinics. However, the prevalence of anemia has been still a challenge but is estimated at about 46 percent. Thus the burden of disease like anemia in pregnancy has been poorly studied hence the extent has not been clearly known. This has been especially among people of low social economic status. Mbagathi sub-county Hospital, for instance, caters for the urban poor people. A majority of the patients attended to here live in the sprawling Kibera slums in Nairobi, Kenya. These people live on less than a dollar a day, signifying lack of adequate and well balanced diets in addition to living in unsanitary conditions [11].

Statement of the problem

All over the world, every existing government aims at providing meaningful healthy conditions to their people, including young ones. Anemia has been a major public health problem in developing countries, contributing significantly to morbidity and mortality in children less than ten years. About 43% of children fewer than ten years are anaemic worldwide and two-third are residing in Sub Saharan Africa. Despite the respective government effort to improve health, provide needed medications, even where blood transfusions are available there is still significant cases of fatality rate of about 31 %. This study aimed at determining the prevalence of anaemia, associated factors of severe anaemia as well as morphological types of anaemia among children under five years attending Rongo Sub county Hospital.

Anaemia prevalence on less than ten years old children patients

Anemia has been a public health problem that affects populations in both rich and poor countries. Studies done by WHO [5] in Geneva, posited that although the primary cause is iron deficiency, it is seldom present in isolation. More frequently it coexists with a number of other causes, such as malaria, parasitic infection, nutritional deficiencies, and haemoglobinopathies. Given the importance of this pathology in the world, numerous countries conduct interventions to reduce anaemia; particularly in the groups most susceptible to its devastating effects: pregnant women and young children especially the pre-school age children (PreSAC). Anemia is the most prevalent nutritional deficiency globally, affecting about a quarter of the world population. In Brazil, about one-fifth of children under five years of age are anemic. Previous case studies indicate prevalence rates much higher

among indigenous peoples in the country. The First National Survey of Indigenous People's Health and Nutrition in Brazil, conducted in 2008–2009, was the first survey based on a nationwide representative sample to study the prevalence of anemia and associated factors among indigenous children in Brazil.

Sickle-Cell Anaemia, also sickle-cell disease, hereditary condition in which haemoglobin, an oxygen-carrying protein in the blood, is altered, leading to periodic interruptions in blood circulation. According to Holloway [12] the disease was found predominantly in blacks; it also occurs in the Middle East and the Mediterranean areas. Symptoms of the condition appear at about six months of age and may include enlargement of the abdomen and heart and painful swelling of the hands and feet. In adolescence, sexual maturation may be delayed.

A survey done by WHO [13] prescribed and added that correcting anaemia requires an integrated approach based on identifying and addressing the contributing factors. Moreover, low blood haemoglobin concentrations may be caused by genetic traits like sickle cell and thalassaemias; inadequate bio available dietary iron, folic acid and/or vitamin B12; malaria, schistosomiasis, hookworm, or human immunodeficiency virus (HIV) infections; and some non communicable diseases. The work of Steer [2] with analysis conducted to better understand the prevalence of anaemia, attributed to iron deficiency estimates that the proportion of all anaemia amenable to iron was around 50% in women and the global prevalence of anaemia in 2011 42% in children, but higher for severe anaemia (over 50% for children and non-pregnant women and over 60% for pregnant women) and in regions where there are fewer other causes of anaemia [13]. According to Kozuki, Lee and Katz [14] the proportion was lowest where other factors contribute to anaemia, for example, <45% in non-pregnant women in different parts of the WHO African and South-East Asia Regions. Iron deficiency anaemia should ideally be addressed through dietary diversification and improved access to foods that have high levels of bio available iron, including animal products. Daily or intermittent iron supplementation, alone or together with folic acid and other micronutrients, can be used for high-risk groups (children, pregnant women and women of reproductive age), to improve iron intakes [2].

The disturbances in blood flow associated with the disease also dispose affected people to infections and leg ulcers. As put forward by Allen, de Benoist, Dary and Hurrell [15] these symptoms are due to the altered haemoglobin, which changes shape when the amount of oxygen in the blood is reduced for any reason. The red blood cell in which the haemoglobin is contained also changes its shape, from round to crescent (sickle shaped). The sickle-shaped red cells interfere with normal blood flow by plugging up small blood

vessels. Similarly, WHO [5] supported that in the last three decades, there have been various attempts to produce estimates of the prevalence of anaemia at different levels including at the global level, but until the present time, there has never been a systematic review of all of the data collected and published with the objective of deriving regional and global estimates [16]. The WHO Global Database on Anaemia has filled this gap: data from 93 countries, representing as much as 76% of the population in the case of preschool-age children, were analyzed and used to develop statistical models to generate national prevalence estimates for countries with no data within the time frame specified. Research done by Brabin, Premji and Verhoeff [6] agreed that sickle-cell anaemia occurs when an individual inherits a sickle-cell gene from each parent. Programmes have been initiated to detect carriers of the gene, who do not themselves show the trait. Such carriers are informed that a child resulting from the union of two carriers runs a one-in-four risk of having sickle-cell disease. In Africa in countries like Ghana and Kenya this is not a strange phenomenon. Anemia in children continues to be a major public health challenge in most developing countries, particularly in Africa. In Kenya, the work of Waweru, Mugenda and Kuria [17] revealed that anemia in the early stages of life leads to severe negative consequences on the cognitive as well as the growth and development of children, which may persist even after treatment. Moreover, Koram *et al.* [8] who examined the prevalence of anemia in under-five children in the Ghanaian population helped to inform and serve as a guide to health policies and possible interventions. Therapy for sickle-cell anaemia is largely to allay symptoms. Preventive administration of penicillin to affected children by the age of four months greatly decreases mortality from infections. For this reason, routine screening of newborns for sickle-cell anaemia is currently carried out in most developed countries and developing countries including Kenya [9]. The research done by Yambo, Odhiambo and Odera [10] opined that the routine checking normally alleviate stress among patients of all ages and that include adult as well as young children. It has been found out that sickle-cell anaemia among other related health conditions also cause unnecessary stress to young ones [10]. Consequently, sickle-cell anaemia should be prevented at all costs.

RESEARCH METHODOLOGY

The study adopted hospital based cross sectional survey design. According to Bloomberg and Volpe [18], the survey studies are concerned with assessing attitudes, opinions, preferences, demographic practices and procedures. The work of Best and Kahn [19] further asserted that this design gathers data at a particular point in time with the intention of describing the nature of existing conditions, identifying standards against which existing conditions can be compared and determining the relationships that exist between specific events. Survey design is suitable in the study as it

enabled the researcher to collect original data from the parents of less than ten years old patients attending Rongo sub-county hospital easily. The design allows the use of several instruments of data collection like the questionnaires, document analysis and interview schedules. According to Babbie [20] a survey research is intended to produce statistical information about aspects of health that interest policy makers and health planners.

The study targeted Rongo sub-county hospital. It comprised 250 parents of anemic children attending the hospital, 7 medical laboratory technologists, 1 medical superintendent 1 hospital administrator. Sampling is the process of selecting a number of individuals from a population such that the selected group contains element representative of the characteristics found in the entire group [21]. Since the hospital has been one, there is one medical superintendent, an administrator and 7 laboratory technologists. Purposive sampling was used to select them as they were few as suggested by Kothari [22]. Due to the fact that there are 250 parents of anemic children attending the hospital, 30 percent of them were considered to be 75 parents. It was so because Best and Kahn [19], Kothari [22] and Bloomberg and Volpe [18] contend that 30% is statistically significant enough.

The study used questionnaire, and documentary analysis. A questionnaire is a research instrument that gathers data from over a large sample [23]. When using a questionnaire it was easier to ensure that questions and instructions were uniform for all participants which allowed for comparisons to be made Kothari [22]. According to Bloomberg and Volpe [18] the Likert Scale was used for the construction of the questionnaire because was the most popular perception scale particularly to examine the anemia prevalence on less than ten years old children patients' attending Rongo sub-county hospital.

Reliability is the measure of the degree of which a research instrument yields consistent results or data after repeated trial [20]. Before the actual data collection, a pilot study was conducted in the same county among the parents of less than ten years old attending Nyaburu health centre which will not be included in the final study population. From this health centre where 10 parents were randomly selected for the

pilot study, 3 medical laboratory technologists, 3 clinicians and their respective hospital administrator and medical superintendent. The purpose of the pilot study was to enable the researcher to ascertain the reliability of the instruments, and also to be familiar with the administration of the questionnaires. Split-Half technique will be employed for the test. Pilot questionnaires will be divided into two equivalent halves and their correlation confident for the two halves computed using the Spearman Brown prophecy formula. If their coefficient indicates that the degree of the two halves of the test provide the same results, describing the internal consistency of the test then it shows that the instrument is reliable, according to Bloomberg and Volpe [18] minimum correlation coefficient of 0.65 was considered as reliable.

Validity is the degree in which an instrument measures what it is supposed to measure [22]. The researcher will seek the opinion of research experts from Faculty of Health Sciences and the Department of Medical laboratory technology of Mount Kenya University to validate the research instruments. They will assess the instrument and the feedback will be incorporated. This will enable the researcher to discover loopholes and adjust accordingly.

The researcher was fully aware that it was a voluntary activity for the respondents to participate in research they were therefore assured of confidentiality of information since each respondent gave his/her own response/opinion from the questionnaire. The researcher consequently ensured that research questions did not invade personal lives of the respondents. Anonymity of respondents was ensured. The researcher endeavored to guard against plagiarism and also gave credit and acknowledged all the information which was referred to Kombo and Tromp [23].

RESULTS AND DISCUSSION

In this section the research question explored:

What are the determinants of anaemia prevalence on less than ten years old children patients attending Rongo sub-county hospital?

In this study the indicators of anemia prevalence were found to be low haemoglobin level and blood transfusion

Table 1: Has the child been blood transfused?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	42	56.0	56.0	56.0
	No	33	44.0	44.0	100.0
	Total	75	100.0	100.0	

Parents/guardians responded that most children have been blood transfused making it 56 percent of the valid cases. This means that anemic cases were

proportionally high. The finding has been supported by the work of Brabin *et al.* [6], Muoneke *et al.* [7] and WHO [5] when they supported that in the last three

decades, there have been various attempts to produce estimates of the prevalence of anaemia at different levels including at the global level, but until the present time, there has never been a systematic review of all of the data collected and published with the objective of deriving regional and global estimates.

When the medical laboratory technologists and technicians were asked about malaria results tested among the fewer than ten years old children, they responded as indicated in Figure 1.

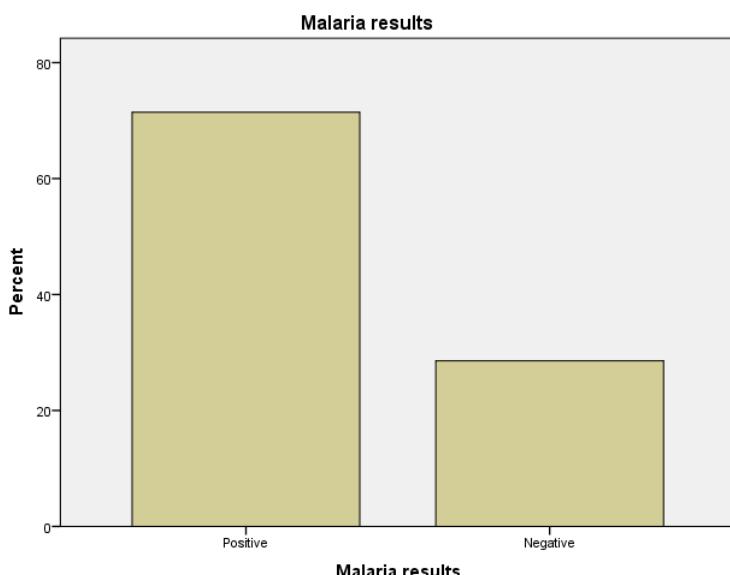


Fig-1: Malaria status

The results revealed that 71.4 percent of the respondents reported that malaria test was mainly positive hence high prevalence. The findings concurred with Yambo [10], Steer [2] and Koram et al. [8] that severe anemia is a common blood disorder in children from developing countries. Mortality rates from severe anemia are high in these regions with high levels of poverty, malaria infections and malnutrition in addition to the problems of inaccessible and poorly funded health facilities.

CONCLUSION

The results of the study established that:

Most children have been blood transfused making it 56 percent of the valid cases. This means that anemic cases were promotionally high. The results revealed that 71.4 percent of the respondents reported that malaria test was mainly positive hence high prevalence.

RECOMMENDATIONS

This study came up with the recommendation that hospitals should be stocked with enough blood because most children have been blood transfused

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