

الآية

(لَقَدْ أَرْسَلْنَا رُسُلَنَا بِالْبَيِّنَاتِ وَأَنْزَلْنَا مَعَهُمُ الْكِتَابَ وَالْمِيزَانَ لِيَقُومَ النَّاسُ بِالْقِسْطِ وَأَنْزَلْنَا الْحَدِيدَ فِيهِ بَأْسٌ شَدِيدٌ وَمَنَافِعُ لِلنَّاسِ وَلِيَعْلَمَ اللَّهُ مَن يَنْصُرُهُ وَرُسُلَهُ بِالْغَيْبِ إِنَّ اللَّهَ قَوِيٌّ عَزِيزٌ)

(الحديد: آية 25)

Dedication

To

My Parents.

To

My brothers.

To

My sisters.

To

My husband

And To Sudanese children

Acknowledgements

First, all thanks of **ALLAH** for giving me the power and – willing to complete this study.

I would like thanks to our supervisor of this project **professor Babiker Ahmed Mohammed** for the valuable guidance and advice. He inspired us greatly to work in this project, too thank to **co supervisor Dr. Munsoor Mohammed Munsoor**. Also my thanks to **staff of hematology lab at Albuluk, Ahmed Gasim and Gaffer Ibn ouf Children Specialized Hospitals**. Iam deeply indebted and grateful to **Miss Esraa Omer**. My thanks are extended to all those who gave me help during this work.

Abstract

Anemia is a major public health problem worldwide. It affects mainly infants in low-income countries. At the global level, anemia prevalence is over 30%. In sub-Saharan Africa, anemia prevalence levels are not well documented due to inadequate and insufficient techniques used to estimate anemia in the population.

The aim of this study is to determine the frequency of iron deficiency anemia among the microcytic hypochromic anemia. In 500 infants and 100 control of the age between (two to twenty four) months in Khartoum state children hospitals Albuluk, Ahmed Grasim and Gaffer Ibnouf. Fully automated hematological analyzer (sysmex) was used for the CBC analysis, and fully automated Biosystem A25 was used for the iron profile analysis. also spectrophotometer used for iron profile analysis, manual analysis was used for blood film and reticulocyte count .

All children were selected as anaemic (Hb < 11.2 g/dl). Red cell indices were used to classify anaemia. The means of the haemoglobin concentration Hb 8.3 g/dl, PCV 26.9%; MCV 62.7fl, MCH 20.0 pg, MCHC 30.4/dl and (RDW) 18.3 %, Mean platelets counts $320(10^3/\mu\text{l})$. Mean total red blood cells $4.1(10^6/\mu\text{l})$, the means of parameter in control sample shows Hb 14.1 g/dl, PCV 35.2%; MCV 84.7, MCH 30.8pg, MCHC 31.6/dl and (RDW) 13.1 %, Mean platelets counts $271.4(10^3/\mu\text{l})$. Mean total red blood cells $4.2(10^6/\mu\text{l})$ the reticulocyte count among study populations has a mean of 1.9% in samples. And 1.0 % in control. the serum iron 28 $\mu\text{g/dl}$, serum ferritin 97 $\mu\text{g/dl}$, TIBC 470 $\mu\text{g/dl}$ and iron saturation 7%.

As for morphology the blood films shows microcytic hypochromic, -pokylocytosis target and pencil cells.

This study conclusion IDA is common in Sudanese children. Sixty two percent of mothers gave history of anemia during pregnancy and 74% gave history of poor nutrition indicating low income. The frequency of iron deficiency anemia in infants in Khartoum state 23.6%. Anemia among the infants in Khartoum state had become cenalarmy public health problem.

ملخص الدراسة

هذه دراسة مقطعية وصفية تحليلية تم إجراؤها لتحديد نسبة تردد مرض فقر الدم الناتج عن نقص الحديد وسط 500، من الاطفال المرضى اعمارهم ما بين شهرين حتى سنتين الذين يترددون على مستشفيات الاطفال بولاية الخرطوم البلك التعليمي، احمد قاسم وجعفر بن عوف للأطفال في الفترة من اغسطس 2010 حتى مايو 2012 .

اخذت خمسمائة عينة دم خمسة مللى من كل مريض بعد موافقة ذويهم (2.5 مللى فى حاويات تحتوى على مانع تجلط (EDTA) و2.5 مللى فى حاويات خالية من مانع التجلط). تم إختبارات إعداد الدم الكامل، وإختبار نسبة كل من الحديد و ال (ferritin) فى الدم . مقابل مائة عينة لاطفال اصحاء(عينات الضابطة) اجرى لها ذات الاختبارات.

تم إستخدام جهاز (Mythic18) و (A25) اللذان يعملان اتوماتيكيا للتحليل الكامل للدم وتحديد نسبة الحديد وال (Ferritin) على التوالى كما تم استخدام ال Spectrophotometer لتحليل

الحديد والفرتين وال Total Iron Binding Capacity . وال Iron saturation

وجد أن متوسط خضاب الدم 8.3 g/dl وحجم الخلية المحشوة % 26.9 PCV, متوسط حجم

الخلايا, 62.7 fl, متوسط حجم ال هيموقلوبين ومتوسط هيموقلوبين الخلية MCH 20.0 pg

ومتوسط تركيز الهيموقلوبين MCHC 30.4 , الخلية الشبكية % 1.9 وال RDW 18.3% والصفائح

الدموية . (320x10³/µl) والخلايا الحمراء (4.1x10⁶/µl), متوسط تركيز ال هيموقلوبين MCHC

31g/dl, الحديد 28 µg/dl وال (Ferritin) 97µg/dl وال TIBC وال iron saturation على

التوالى 470 µg/dl و7% للمرضى وقد كانت متوسطات نتائج ال control:

Hb 14.1 g/dl, PCV 35.2% MCV 84.7 MCH 30.8 pg , MCHC 31.6/dl, RDW

13.1 % , Platelet 271.4(10³/µl). RBCs 4.2(10⁶/µl), Retics1.0% serum iron 95.4

µg/dl serum ferritin 89.7 µg/dl, TIBC 237.9 µg/dl, iron saturation 24.5% وقد

اظهرت النتائج الاحصائية ان نسبة تردد فقر الدم الناتج عن نقص الحديد هو 23.6%

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List of abbreviations

AI	Adequate Intakes
CRA	Canada Revenue Agency
CRA	comparative risk assessment
FAO	Food and agriculture organization
FLVCR	feline leukemia virus C receptor
DRIs	Dietary Reference Intakes
Hb	Hemoglobin
HIV	Human immunodeficiency virus
LDCs	lesser-developed countries
MCH	Mean cell hemoglobin
MCHC	Mean cell hemoglobin concentration
MCV	Mean cell volume
NHNES	National Health and Nutrition Examination Survey
PCV	Packed cell volume
RBCs	Red blood cells
RDW	Red blood cell distribution width
RDA	Recommended Dietary Allowances
SFT	Stimulation of iron transport
STfR	Serum transferrin receptor
TWBCs	Total white blood cell counts
WFP	World Food Programme
WIC	Women infant and children