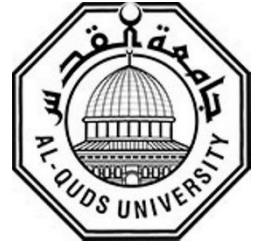**Al-Quds University**

Deanship of Graduate Studies

Missed Opportunity In Diagnosis And Treatment Of Iron (Deficiency Anemia in children (6-36 month old

Mohammad Ali Awar

Master Thesis

Jerusalem- palestine

2015-1436

Missed Opportunity in diagnosis Iron Deficiency

Anemia in children (6-36 month old)

Prepared by

Mohammad Ali Awar

MD 4th year pediatric resident

Supervised by

Hatem Khamash

MD Pediatrician and Neonatologist

Thesis submitted one of the requirements for the degree of Master Child

Health Schools of medicine Deanship of graduate

studies Al Quds University 2015

2015-1436

Deanship of Graduate studies

Al-Quds University

Thesis Approval

Missed Opportunity in diagnosis Iron Deficiency Anemia in children

(6-36 month old)

Prepared By: Mohammad Ali Awar

Registration No   21220379

Supervisor: Dr Hatem Khammash

Master thesis submitted and accepted, Date: 23/02/2015

The names and signatures' of the Examining committee members are As

follows

1- Head of committee: Signature

2-Internal Examiner: Dr. Sumaya Sayej   Signature

3-External Examiner: Dr. Tony Waterston   Signature

Al-Quds-Palestine
1436-2015

Dedication

To my Parents (Ali and Basima) the people who gave me everything they can

To my Great Aunt Tagreed, the one who stand with me in all my circumstances

To my Beloved wife Ola, the Great doctor full of emotions, joy and faithfulness

To my Son Ali who taught me the meaning of being a father and made me feel with the entire struggle that my parents did for me

To my brothers and sister, the people that help me always and proud of me everywhere

To my grandmother, the most lovely woman in the world

To all my family members whom stand with me and show me all kinds of love and friendship

To all the teachers and doctors whom taught me how to be a great person and a real doctor

To all I dedicate this work

Declaration

I certify that this thesis submitted for the master degree in child health is the result of my own research, except where otherwise acknowledged, and this has not been submitted for a higher degree to any other university or institution

Signed:

Mohammad Ali Awar

Date: 15-3 – 2015

Supervised by Dr Hatem Khammash

Acknowledgement

<u>My sincerest gratitude</u>

To my adviser Dr Hatem Khamash, for helping in planning, support, encouragement and guidance, and his great effort in helping me and my colleague in the residency program and in MACH

To Dr Samir khalil for his support and encouragement in all the steps of my residency and during the period of MACH, and for his effort in helping of creating many academic programs in Palestine

To all the Teachers and coordinators of MACH for their support and efforts in building my character as a Master student, as a Doctor and as an effective person in the community

To the Pediatric Society-Palestine (PSP) for their support, and efforts in supporting and helping many pediatricians in their medical fellowship, or their academic study.

To all the Team of (Ramallah Hospital) Palestine Medical Complex for their cooperation

Without them this work would not have been accomplished

Abstract

Background: Iron deficiency Anemia is an Important Health Determinant, and it is the most common Anemia in childhood. It affects the motor and neurological development of children. The most common presentation of Iron Deficiency anemia is asymptomatic, well nourished infant or child who has a mild to moderate microcytic, hypochromic anemia. This makes a responsibility on the medical staff to detect and treat IDA

Objectives: 1) To assess the missed opportunity in diagnosis of Iron deficiency anemia among children 6-36 month old visiting the Emergency department for acute illnesses. 2) To create policies for detecting children and initiate treatment for them in emergency room.

Methods: The research is conducted using an audit plan, observational study of assessing the detection of Iron Deficiency Anemia, prescribing Iron treatment, and giving instructions about the iron rich food, during CBC check at The Emergency Department, In two phases pre and post intervention to the medical staff (teaching lectures, Posters and medical prescription of Iron).during the period of 29/10/2014 and 26/11/2014 at Palestine Medical Complex

Participant: The pediatric resident (12 residents) At Palestine medical complex during their work at The Emergency department. All Children aged 6 – 36 month old with no chronic illness were included and their CBC were checked for other reason than hematological causes.

Findings : From a total number of 1155 aged between 6 -36 months old patients visited the emergency department over 4 weeks period 29/10/2014-26/11/2014 (396 patients) (34%,) had CBC check. Twenty Eight (28) patients were excluded. The percentage of anemia was 40 % of 368 patients had CBC test for reasons other than hematological causes. Most cases were mild anemia 72 %, moderate 27 % moderate, and 1 % was severe. The average age of anemic children was 16.1 month old.

The percentage of detecting and treating anemia had been increased from 1.5 % before the intervention to 8 % after the intervention. Giving instruction about repeating CBC has increased from 1.5 % to 2.3 % before and after intervention respectively. Only one patient was discharged on prophylaxis iron No documentations in the patients file were found about family history of thalassemia, or if they were given instructions about Iron rich food or even if the patient were referred to hematologist for further evaluation.

Conclusion: Significant iron deficiency anemia was found in targeted group. Although most of the cases were mild anemia most cases missed the opportunity of diagnosis and initiating of treatment. The audit cycle intervention improved the practice marginally.

Recommendation: We need to continue with audit and re-audit to improve practices in hospitals and create polices that increase the awareness of the medical team and the community about Anemia as a significant problem.

Table of Content

List of appendices

- The questionnaire in Arabic language

- The questionnaire in English language

- Pictures of the intervention that was done

(pic-1) A poster on the emergency department entrance

(pic-2) The Medical prescriptions for iron.

(pic-3) The emergency room with posters and pamphlets of anemia on the walls
(Pic-4) anemia posters in the waiting room.

List of abbreviations

Abbreviation	Definition
HgB	Hemoglobin
CBC	Complete blood count
Pts	Patients
Tx	Treatment
Mx	Management
IDA	Iron deficiency anemia
MCV	Mean corpuscular volume
ER	Emergency room

List of charts

(4.13)	therapy after intervention	
Chart (4.14)	the percentage of anemic patients that were discharged with instruction to repeat the CBC	39
Chart (4.15)	the percentage of patients were discharged on prophylaxis iron therapy post intervention	39
Chart (4.16)	The most common chief complaint for asking CBC	40

Chapter One

1.1 Introduction.

Anemia is an important health determinant of health in the world and in Palestine, it may affect the motor, and cognitive growth of the children especially at early stage of growth and development, indeed even iron deficiency without anemia have also has a serious effect on motor and mental development. [1]. According to the Palestinian central bureau 2013 the prevalence of anemia was 19.4% in children of age range between (6 -59) month old, ranging in 25.6 % in Gaza, 13.4 % in the west bank. [2]. Still we have a lack in the studies that determine the exact distribution and extent of this problem, which make our health system deficient of the polices in facing this problem, and keep it not rise to the level that all the people aware of it, and focusing on other aspect of the health problems,

The most common presentation of iron deficiency anemia is asymptomatic, well nourished infant or child who has a mild to moderate microcytic, hypochromic anemia. Other than the presentation of pallor, lethargy, tachycardia or cardiomegaly. This makes more stress on the medical staff to be aware of it and able to detect and treat or even giving prophylaxis for it.

1.2 Justifications.

We need to create policies for detection of Anemia especially iron deficiency anemia, and Improve our practice in detection and treating and even preventing it. Especially with the growing health system that we have, which is dependent on the

external support, and lack of many studies to determine many health problems we have. Although we are able to use our resources and what we used to do simply to raise many health problems including the anemia and try solve it.

1.3 Motivation

Everyone is able to improve the practice at his level using the simple ways used to do in order to protect against iron deficiency anemia especially in children between 6-36 month old. We wish to create policies for this which is not available at our health system in Palestine?!! Overall our Goal is to improve the growth and psychomotor development of our children.

1.4 Problem of Study.

As a matter of fact many children in our Palestinian health system, left undetected of Iron deficiency anemia even after they have CBC check for other reason than hematological causes for example; many acute illnesses for them doctors used to ask CBC.

1.5 Main Objective.

- Decrease the missed opportunity of detecting and treating Iron deficiency Anemia

- Making Iron Deficiency Anemia a prominent problem to the staff

- By far improve growth and cognitive function for Palestinian children

- This study can be extended to include other hospitals in the Palestinian health To system and improve practice

1.6 Specific Objectives.

Decrease the missed opportunity to detect and treat iron deficiency anemia by:

- Improving the practice of detection of iron deficiency cases

- Treating and even Giving prophylaxis iron therapy as needed

- Increasing the awareness of the Iron rich food and decrease the habits of drinking drinks affect the absorption of iron for example tea, Coca Cola, and coffee.

1.7 Assumptions.

- The instruments used in the study are valid and reliable.

- The participants are cooperative.

1.8 Explanation of Structure.

The first chapter is addressing the background of the study. This chapter also includes the problem of the study, the significance of the study and the expected outcomes.

The second chapter is addressing the literature reviews about Iron deficiency anemia in children especially in infant, and toddlers our age group compliance.

The third chapter is addressing the methodology used, the study design, the sampling, the intervention, the research tools as well as the timetable and the ethical considerations and results of the leading study.

The fourth chapter is addressing the results of the study; it gives more information about the percentage of iron deficiency anemia we have in our sample at Ramallah hospital (Palestine Medical complex), and how practice was improved before and after interventions. And shows the percentages of children at risk of iron deficiency anemia, in

addition to raise the most common reason of doing CBC; which can be a start point to improve practice of ordering labs in the future.

The fifth chapter is discussing the findings of the study and comparing the pre and post intervention results with addressing the limitations that faced the study and the barrier that we faced during work. With the aim of create new plans for future.

Chapter Two

Literature Review

2.1 Introduction.

This chapter addresses what is known about iron deficiency anemia in children especially in infant and toddlers as our age group ranged from 6- 36 months of age. In addition to the simple statistics that we have at our Palestinian center bureau 2013.

2.2 Background

Anemia is a worldwide problem and an important health determinant, with iron deficiency anemia causes approximately 50 % of all anemia. And it represents the most common anemia in childhood worldwide and also in Palestine with the limited data in Palestine. According to the WHO 47.4 % of anemic people worldwide are among preschool aged children. [3]

Iron deficiency anemia develops when there is an inadequate intake or bioavailability of dietary iron. Infants and children are vulnerable to iron deficiency because it's a period of rapid growth and development in which the requirements are increased.

In United States, about 9 percent of toddlers (one to three years old) have iron deficiency and 2 to 3 percent have iron deficiency anemia.[4]

The causes of Iron Deficiency Anemia are varies but what we may face in our age group are:

- Most infants are born with good iron store; during the period of rapid growth the iron store became inadequate to meet the requirement of growth and

development. In addition, many complementary foods are not high in iron. And so a complementary supplementation of iron will meet these requirements.

- Breast feed infant without iron supplementation after 4 month of age.

The iron in breast milk is absorbed three times better than the iron in formula, but the iron content of breast milk is often not sufficient to meet the requirements of growing infants around the time a baby starts eating solids; he needs additional iron in the form of fortified cereals and other iron-rich foods. [1] .Milk baby bottle fed infant (9 month – 24 month) receiving large volume of cow's milk or even prolonged bottle feeding , leading to poor intake of iron rich food .Cow's milk is low in iron. It also interferes with the body's absorption of iron, and it may replace some iron-rich foods in the diet. That was many recommend avoiding nonformula Cow's Milk as it can also irritate the lining of a baby's intestine, causing bleeding. This slow loss of blood in the stool – along with low iron intake – can cause anemia. And so if needed to use the fortified bottle fed [5] [6]. Formula without iron (became less prominent in Palestine)

- Delayed introduction of iron fortified infant cereals

- Premature and low-birth-weight babies age 2 months old and older.

Full-term infants are born with iron stores accumulated during the last months in utero. These stores can last four to six months. The iron stores of babies born prematurely may last only about two months. And the smallest the premature, the less iron store. [1], [7] Children was born to iron deficient mother shows reduction in the hepatic non- heme iron make them vulnerable to iron deficiency by depletion of iron store. [8]

Although IDA typically presents as a nutritional anemia, it also may be caused by an underlying medical problem such as gastrointestinal blood loss, malabsorption syndrome, or a chronic inflammatory disease.

Iron deficiency anemia altered motor development and the neurological and cognitive maturation of children; affecting their ability to learn, and communicate; it may have relation to the number of dopamine receptors and serotonin level. Altered myelination of white matter, changes in monoamine metabolism in striatum, and functioning of the hippocampus.[9] [10] [1] [11]

Iron deficiency anemia affects visual and auditory functioning by affecting neurological myelination , leading to longer ABR and VEP tests [12] [13]

However, the possible confounding effects of poor socioeconomic backgrounds prevent causal inferences from being made on the effect of iron treatment on development make the issue remains uncertain whether the poor development of iron-deficient infants is due to poor social backgrounds or irreversible damage or is remediable with iron treatment.[14]

Lower mental test scores persisted in infants with iron-deficiency anemia despite extended oral iron therapy and an excellent hematologic response. Iron-deficiency anemia may serve as a marker for a variety of nutritional and family disadvantages that may adversely affect infant development. [15]

Iron-deficiency anemia altered physical growth. As Growth hormone secretion is related to serum transferrin levels, suggesting a positive correlation between iron-transferrin levels and an increase in height and weight. [16]

A randomized trial involving four to six month old exclusively breast fed infants in India, oral iron supplementation resulted in better growth velocity, especially those infants who were nutritionally compromised or anemic. [17]

In another trial, low birth weight infants were given either early iron supplementation (ferrous sulfate 2 mg/kg per day begun as soon as enteral feedings reached 100 mL/kg per day) or later supplementation (begun at 61 days of age). Infants who received early iron supplementation had a reduced risk of infection and number of blood transfusions, and appeared to have a better neurodevelopment outcome at a median corrected age of 5.3 years.[18]

Iron deficiency in children has been associated in defects in immune system and make children more susceptible to infection as it cause mild to moderate defects in leukocyte and lymphocyte function, including defective IL-2 and IL-6 production.[19]

There is relation between iron deficiency anemia and febrile convulsion as is iron is an important element in many neurotransmitters metabolism. A study showed low level Ferriten in patient with first febrile convulsion. [20]

2.3 What is known about Iron Deficiency anemia in Palestine

The Palestine Center Bureau during child statistical report in April 5 2013 showed that in 2010, 19.4% of children aged 6-59 months had anemia: 25.6% in the Gaza Strip and 13.4% in the West Bank. Qalqilya governorate reported the highest rate of anemia

among children with 32.3%, followed by Salfit (19.7%) and Nablus governorate (19.4%). In the Gaza Strip, [2]

A previous study showed that the prevalence of anemia among children less than 5 years of age in West Bank and Gaza are 45.6% and 53.9%, respectively, according to the PCBS, 2001. In areas where more than 40% of the population have iron deficiency anemia, iron supplementation for all children from 6 months through 5 years of age is recommended. [21]

A cross-sectional survey was completed during the period of March-June 2002, focusing on the nutritional status of children living in the West Bank and Gaza Strip. The ages of the children included in this study ranged from 6-59 months many variables were tested included Hgb level and the result showed Overall anemia levels were high, with 37.9% of all the children included in this study having hemoglobin levels lower than 11gm/dl. Using different definitions of anemia for different ages to reflect physiological considerations, they found 42.4% of children 6-11 months old to be anemic (with hemoglobin levels lower than 10.5 gm/dl), in contrast to a rate of 35.5% anemia among older children (with hemoglobin levels lower than 11 gm/dl).Anemia was strongly related to the child's age, and was found to be at its highest levels (53.4%) among children 12-23 months old, followed by 42.4% for those 6-11 months old. Girls were significantly less anemic than boys, with 33.7% of girls found to be anemic compared to 37.3 % of boys. 5. Gaza Strip children were significantly more anemic than West Bank children, with 38.7% of Gaza children found to be anemic compared to 33.5% of West Bank children. Refugee camp-dwelling children were significantly more anemic than rural or urban children, with

a high of 40.1% anemia levels in camp children, compared to 34% for rural and 34.2% for urban dwellers.[22]

A study was done at Gaza strip to estimate the prevalence and to identify possible risk factors of iron deficiency anemia among kindergarten children living in the marginalized areas of the Gaza Strip and to evaluate the effectiveness of supplementing oral iron formula in the anemic children showed prevalence of iron deficiency anemia was 33.5% with no significant differences between boys and girls. Significantly different prevalence of iron deficiency anemia were reported between different governorates of the Gaza Strip. Governorate, low education level of the parents and smoking are significant risk factors for children developing anemia. Significantly lower complete blood count parameters, except for WBC, were reported in anemic children. The oral iron treatment significantly improved hemoglobin concentrations, and normalized the iron deficiency marker. [23]

Another study conducted in Gaza strip also showed that, the prevalence of anemia was 65.3 % .The percentage of anemic children among male and female children was 35 and 30 respectively and statistical analysis showed that male children were more susceptible to anemia. 34.0% of the children were stunted, 20.3% wasted and 45.0% underweight. Anemia was also significantly higher in Jabalia camp than in bait hanon and Bait lahia town pre- school children (P<0.001). [24]

A cross-sectional study on school aged children 6-12 year old in Salfit 2005 showed The prevalence of iron deficiency was 26.7% (12.7% with anemia, and 14% without anemia). The prevalence of iron deficiency among females was 30.5%, and among males was (21.6%). According to place of residency, there was statistically significant difference

between the overall prevalence of iron deficiency among children living in villages compared to children living in the city (22.8% versus 32.6% respectively, P < 0.01), With respect to prevalence of iron deficiency and family income, no significant difference was observed (24.9% low income; 28.1% with medium and 30.2% with high income). [25]

<p align="center">**Chapter Three**</p>

<p align="center">**Methodology**</p>

3.1 Introduction.

The objective of this study is to improve practice and reduced the missed opportunity in detecting and treatment Iron deficiency anemia, using educational intervention, posters, and make available medical prescriptions for Iron. In this chapter, the methodology used to conduct this study is presented. Starting with study design, population, inclusion criteria, exclusion area, and data collection methods, the questionnaire, study limitations, expected problems .This chapter also includes ethical considerations.

3.2 Study Design.

The study conducted in the form Audit cycle, for the assessment of the clinical practice at the emergency room in detecting and treating iron deficiency anemia, in 3 phases, phase one and three for the assessment of anemia and evaluation and revaluation of the practice (pre and post) educational intervention (phase two), which based on literature review of previous studies, and what medical statistics we have at our Palestinian medical bureau.

The intervention (phase two) includes a lecture was done during the morning report for 12 residents, 7 specialist, and 5 interns in Ramallah hospital. Discussing how much is the extent of the problem, and what is the aim of the study, and the goals. And presenting the statistics. And what everyone can do in detecting iron deficiency anemia and treat it.

<p align="center">23</p>

The intervention includes also Postures highlight the iron deficiency problem and explain the need to ask the doctor about the management and the iron rich food, they also include a list with the iron rich food and awareness about the drinks that interfere with iron absorption and should be avoided in children. They were done individually without any financial support from any pharmacology company, that were put in the pediatrics emergency department , just beside the four beds there and in front of each bed in order to allow the patient's companion to see and read them. And also they were put in the waiting rooms of the emergency department and the outpatient clinics to allow more family to read them while waiting.

The others parts of interventions were a smaller size of the same postures were prepared as pamphlets to be given to each patient's companion visits the emergency department. To ensure spreading the message about the importance of iron deficiency anemia for a large number of families.

Also specific medical prescriptions for iron deficiency anemia were prepared without any financial support from any pharmacological company, written in them the generic name of Iron (Ferrous sulfate) with the 2 preparations (either syrup or drops) that are available in our pharmacies. In order to make it easier for the resident at the emergency department to remember the iron deficiency anemia and prescribe Iron with easier and faster way.

I contacted many of the resident and the nurses every other day to make sure that the process is in progress either by coming to the emergency department or by calling them.

3.3 Study Setting.

The study is conducted at Ramallah hospital (Palestine medical Complex) over 4 weeks from 29/10/2014 to 26/11//2014 with two weeks before intervention, and two weeks after intervention.

The data was collected by filling a questionnaire manually directly from the computer. Then the analysis of data was done by simple statistics.

3.4 Population.

The population of this study includes the pediatric patients aged from 6 months and 36 months old that were visited the emergency department during the period of 29/10/2014 to 26/11//2014.

3.5 Sample.

The pediatric patients aged from 6-36 months old that had Complete Blood Count test during their visit to the emergency department.

3.6 Inclusion Criteria.

- Children attended the Emergency room at Palestine medical complex hospital in Ramallah who had a CBC check for other reasons than hematological problems for Iron deficiency anemia
- Age group from 6 month to 36 month old
- Using the CBC data that was done at the hospital lab only (the same CBC machine)

3.7 Exclusion Criteria

- Patients with hematological disease

- Patients with chronic illness

- Patients had CBC done outside the hospital (not the same lab machine)

- The CBC was done for suspecting hematological problem.

3.8 Data Collection Methods

The study was conducted in 3 phases

Phase one: the pre-intervention phase include review the computerized files of the patients visited the emergency department age between 6-36 weeks over two weeks, from 29/10/2014 – 11/11/2014, by filing a questionnaire. And analyzing data according to it .

Phase two: the educational intervention in form of lecture which was done 12/ 11/ 2014, postures, and Iron medical prescription, that were used over the next two weeks. As mentioned before.

Phase three: the post-intervention phase include review the computerized files of the patients visited the emergency department age 6-36 month old over another 2 weeks from 13/11/201 -26/11/2014 by filing a self-administered questionnaire and analyzing data according to it. As reevaluation of the medical practice, and how much became the percentage of detecting and treat Iron deficiency anemia.

3.9 The Questionnaire

The questionnaire is self-administered and it contains initially the patient information including his registration number and phone number, so that we can contact the sample especially with low Hgb. Then it contains many questions about

- The chronic illness that the patient might have

- The family history of thalassemia

- The cause of ordering CBC

- Weather the CBC was done in the hospital or in another outside lab

- Weather the patient was discharged on Iron treatment or prophylaxis

- Weather the patient's family was given instruction about repeating CBC or about the iron rich food

- Weather the patient was referred to hematologist or not

3.10 Study Limitations.

It was difficult to start work due to

- The university letter was delayed till it reached the Ramallah hospital, the problem was either from the way the letter was sent and the communication between the university and the hospital, or it is related to the hospital system of accepting the request that was sent.

- It took a long time till I took the acceptance and approval to work about the study in Ramallah hospital.

It was difficult to follow up the work and even to fill the questionnaire due to

- The study was done in another city than the one I live in

- The study was done in a hospital I don't work in it currently, which make the follow up and cooperation of the team difficult.

- It was difficult to fill the questionnaire and took the information from the computer as I didn't have an access from the hospital and I used to wait each time when I wanted to fill them till the resident finish his work on the computer, which make the work interrupted many times, and delayed.

3.11 Reliability of the Instrument.

- Assuming a reliable result of the CBC that was done at the hospital.
- Assuming that all the information needed is written in the Emergency department note.

3.12 Validity of the Instrument.

- Excluding the other CBC results that were done outside (i.e. done on another CBC machine)
- The instrument was developed by researcher; approved by supervisor.

3.13 Data analysis

- By using simple statistics

3.14 Standards of the study

- Identify the cases of anemia with low MCV
- Using the WHO definition of Anemia for this group of age (Hgb <11 in 6-36 month old children)[3]
  - o Using the WHO classification of the severity of anemia [3]

28

- o Mild 9.9-11

- o Moderate 7-9.9

- o Sever <7

- Using the Harriet Lane value of the MCV for this age a cut of 78 [26]

- Any patient with anemia and low MCV should be discharge on iron treatment for one month and giving instructions about diet and about the need to repeat CBC after one month.

- Cases with Hgb < 9 should be referred to Pediatrician

- Well baby clinic infant on exclusive breast milk visiting ER should be given Iron Prophylaxes therapy

- The dose of IRON for [26]

   - o prophylaxes is 2 mg /kg /day

   - o Treatment is 3- 6 mg / kg / day

Chapter Four

The Results

4.1. Introduction

In this chapter the results of the study are discussed. It includes an assessment for the anemia and a comparison between the practice before and after intervention. The results were done using simple statistics. And represented via charts.

4.2. The results

2555 children visited the emergency department during the period of 29/10/2014 to 26/11/2014, 1155 children were in the age group of our study 6 months to 36 months. (45%) of the total patients. The others were 1400 children (55 %) of the total patients.

Total number of ER patients (2555)

1400 pts 55 %
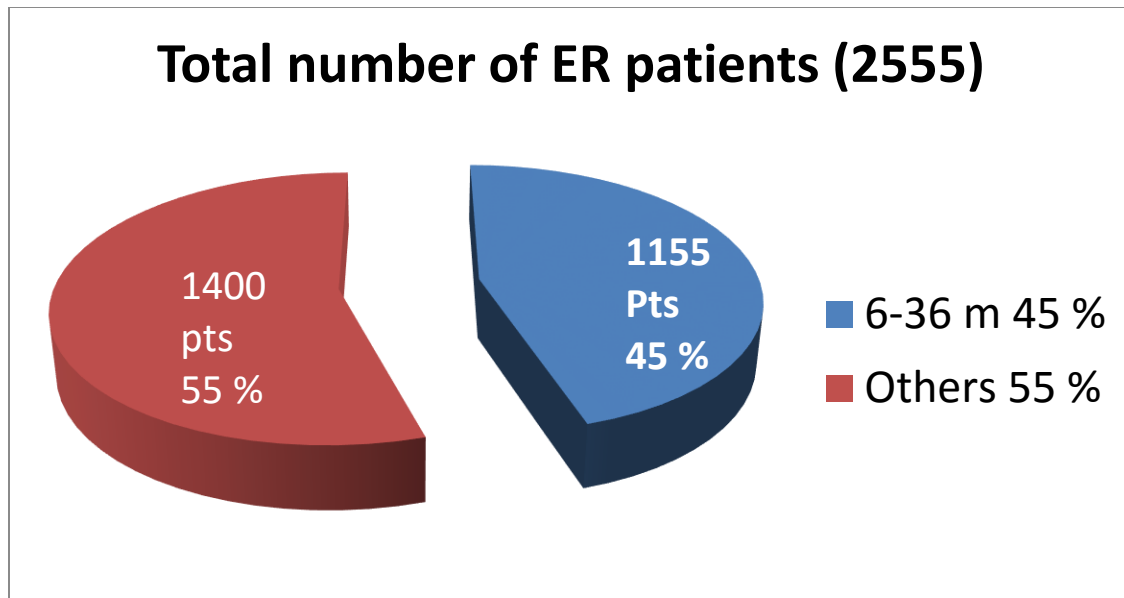
1155 Pts 45 %

■ 6-36 m 45 %
■ Others 55 %

Chart (4.1) the emergency department patients between 29/10/2014 -26/11/2014

396 children (34 % of the children aged 6-36 month) had CBC test for many causes

CBC

396 pts
34 %
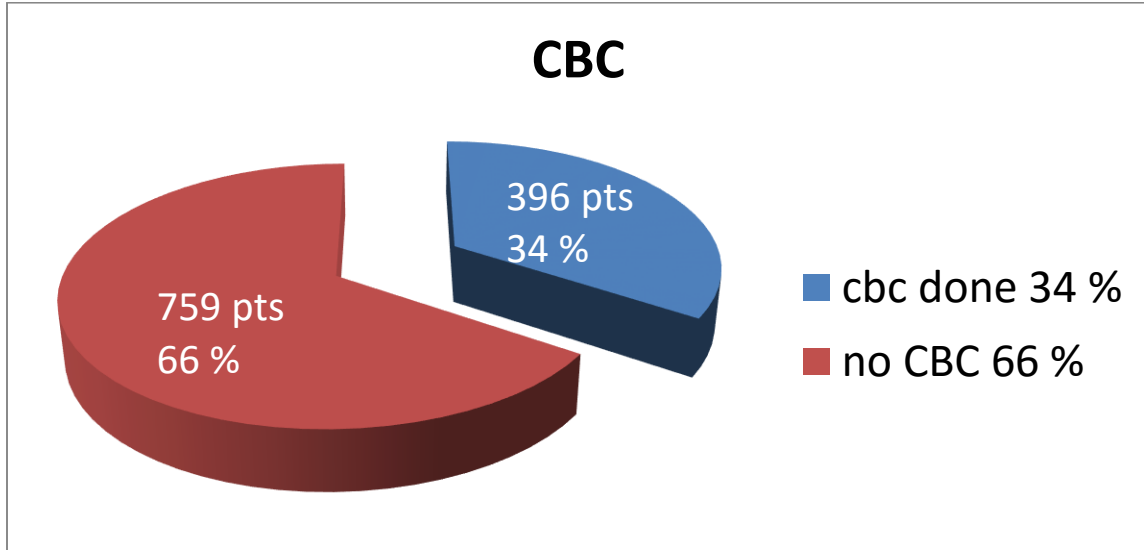
759 pts
66 %

■ cbc done 34 %
■ no CBC 66 %

Chart (4.2) the patients that had CBC at the emergency department during the period of 29/10/2014 -26/11/2014

28 patients were excluded. They were 4 patients suspecting hematological cause of ordering CBC for example trauma (14 %) of them, 5 patients due to CBC that was done outside the hospital (18 %), 19 patients due to chronic illnesses (68 %).

excluded patients with CBC

- 4 pts 14% — hematological case 4 Pts
- 19 pts 68 % — chronic ilnesses 19 pts
- 5 pts 18 %

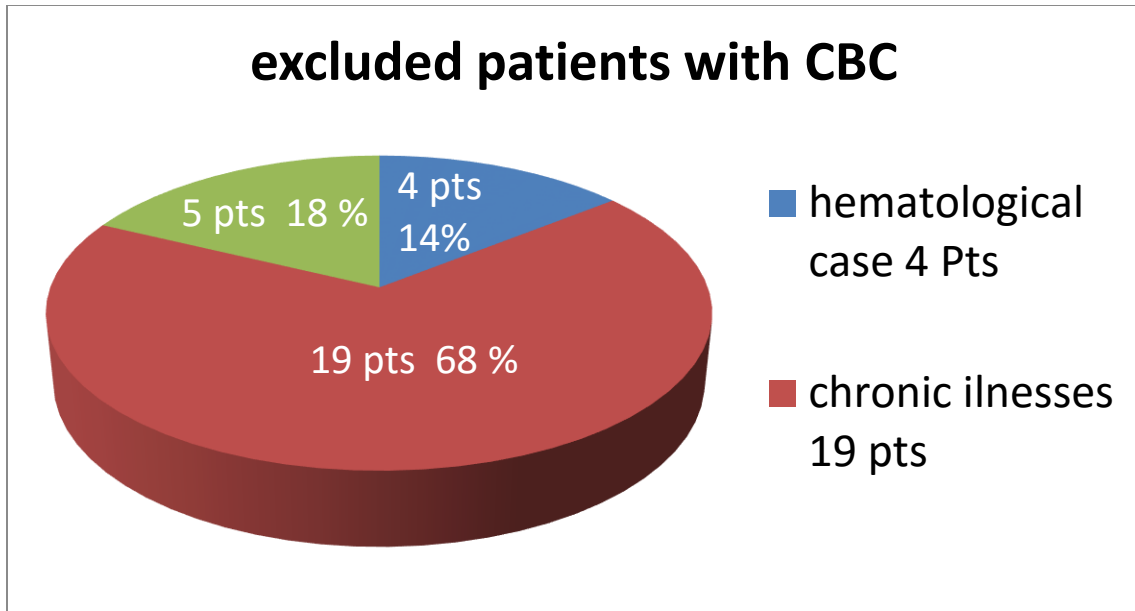Chart (4.3) the excluded patients from the study according to the exclusion criteria

From 368 patients were included in the analysis 149 patients showed anemia with Hgb <11 (40 %), and 219 patients had normal Hgb (60 %)

- 149 pts 40% — Anemia 40%
- 219 60 % — normal HgB 60%
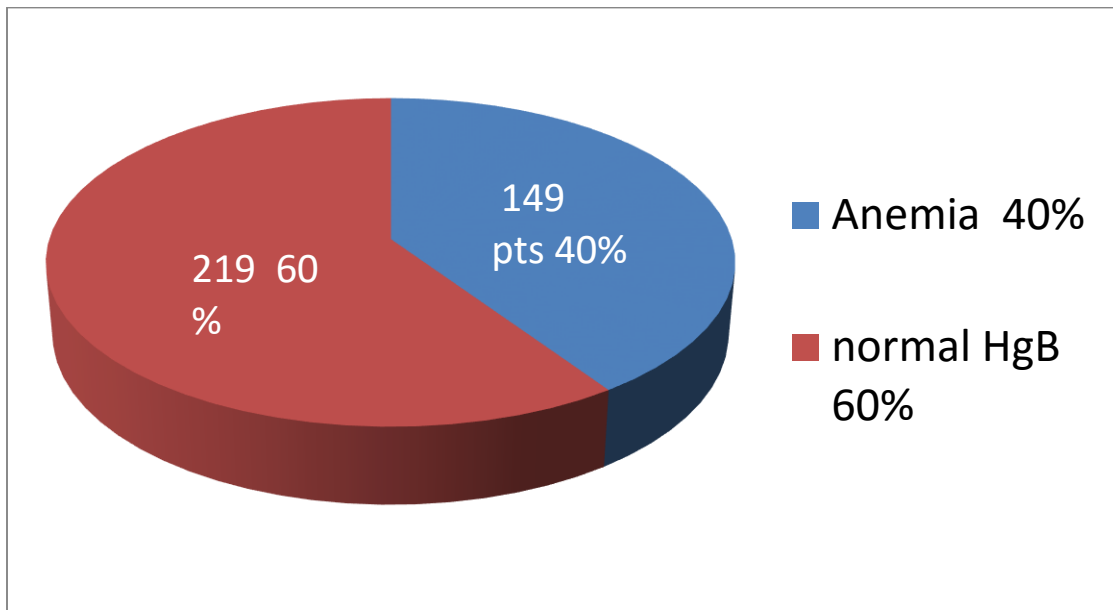
Chart (4.4) the percentage of anemic patients from the total number of patients had CBC

78 patients were males (52 %) and 71 patients were females (48 %)

Gender

71 Pts 48 %

78 pts 52 %

- male 52 %
- female 48 %

Chart (4.5) the percentage of anemic patients according to Gender

From anemic children 130 patients (87 %) had microcytic anemia with Hgb <11 , MCV <78, a percentage of (33.5 %) of the total children who had CBC, the other 19 patients had MCV >= 78 (13 %)

19 pts 13 %

130 pts 87 %

- microcytic anemia 87 %
- nonmicrocytic 13 %
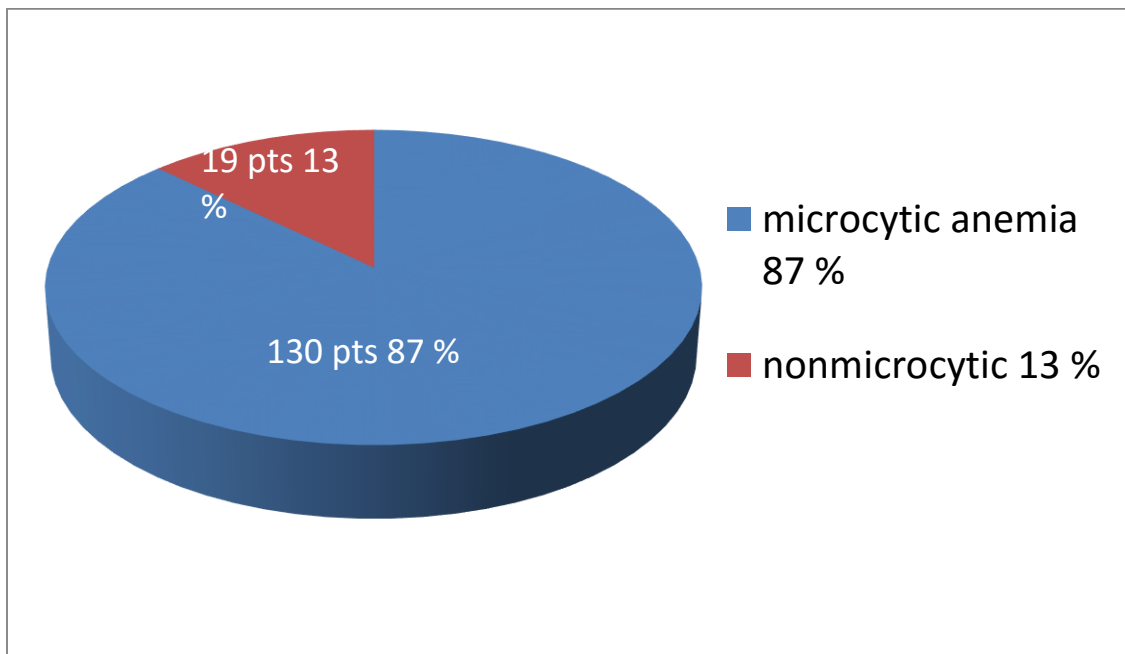
Chart (4.6) the percentage of microcytic anemia vs nonmicrocytic anemia

According to severity, 108 patients (72.5 %) had mild anemia with Hgb (9..9 – 11) , 40 patients had moderate anemia (7-9.9) , (27 %) , from them 4 patients had Hgb < 8 , and one patient had severe anemia with Hgb 6.5 (0.5 %)
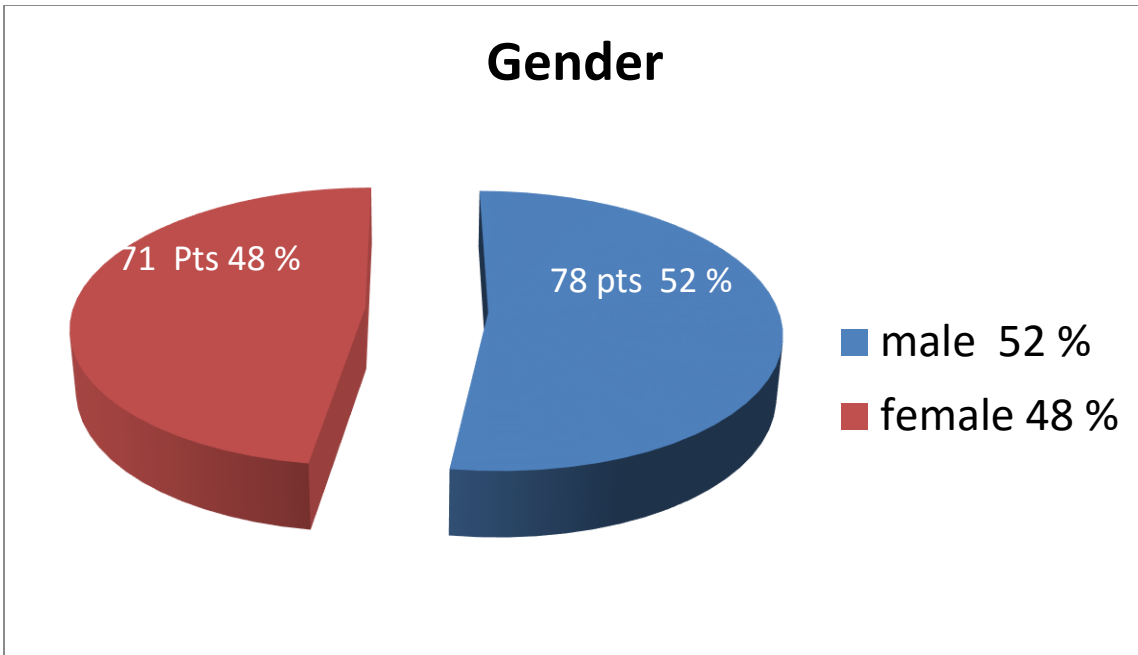
Anemia according to severity

1 pt 0.5 %

40 pts
27 %

108 pts 72 .5 %

- Mild 72 .5%
- Moderate 27 %
- Sever 1 Pt 0.5 %
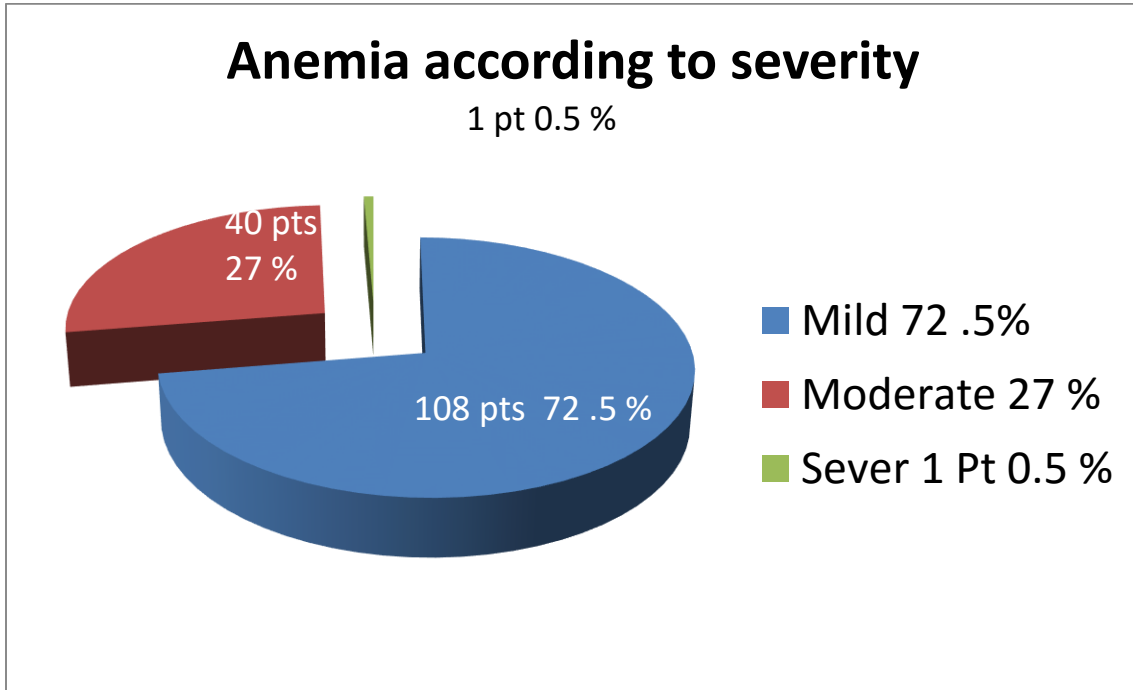
Chart (4.7) classification of anemia based on who classification of severity

Moderate anemia with Hgb <8

- HgB < 8 4 Pts 10 %
- HgB 8-9.9 36 Pts 90 %
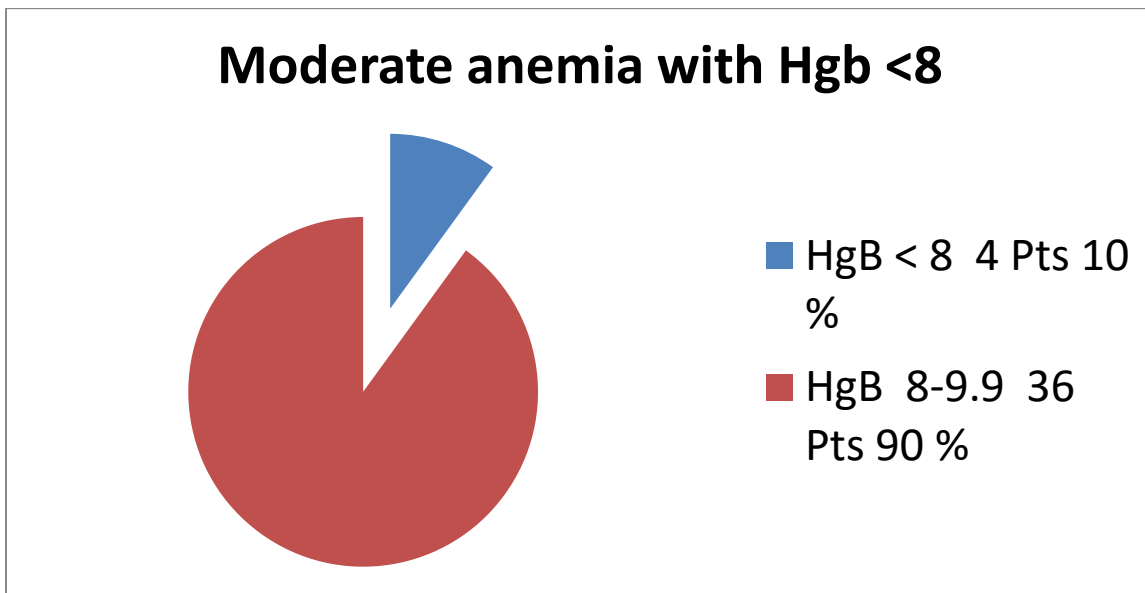
Chart (4.8) the percentage of patients with moderate anemia at risk of sever anemia

The average for anemic age was 16.1 month old, whereas the average Hgb for anemic children was 10.1 , the average MCV in anemic children those with MCV less than 78 was 70.2

With a comparison between male and female, males showed higher percentage of anemia as mentioned especially the moderate and sever type, whereas females had milder anemia than male. In overall no significant differences as the ratio M:F 1.1:1
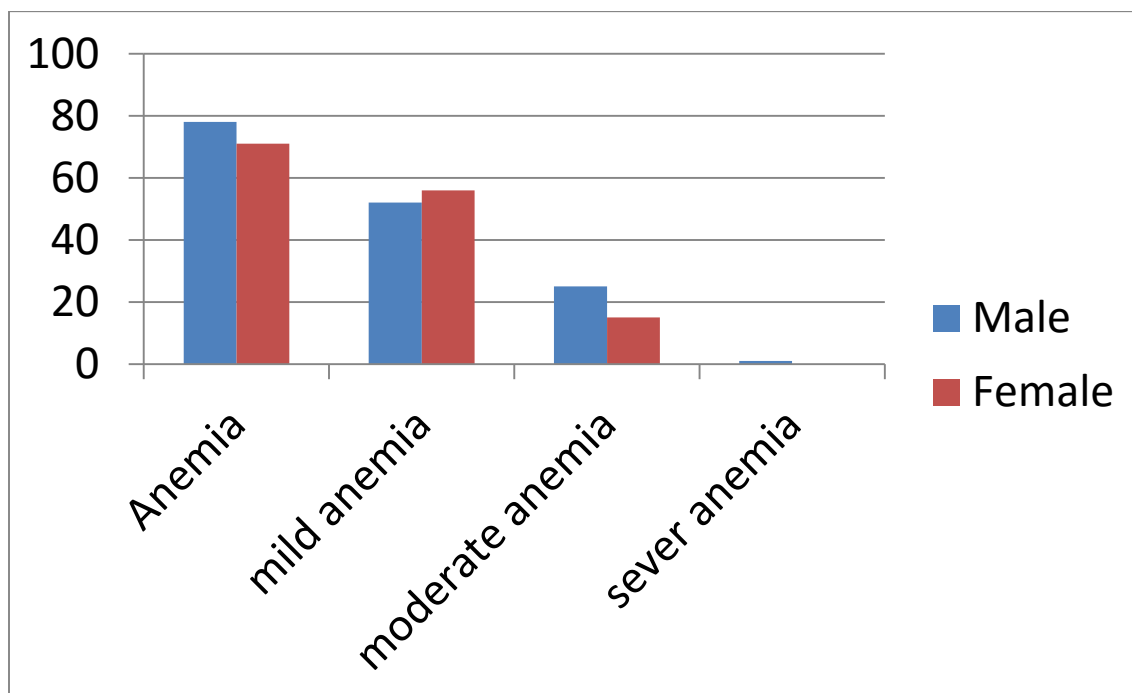
Chart (4.9) comparison between male and female anemic Patients

As a matter of fact still we have other patients with normal Hgb at risk of developing iron deficiency anemia as they showed evidence of microcytosis (MCV <78) which indicate a state of iron deficiency and the need for at least iron prophylaxis and instructions about the iron rich food and they were 156 patients include 88 males and 68 females with a percentage of (40.5 %) of the total patients who had CBC and included in the study.
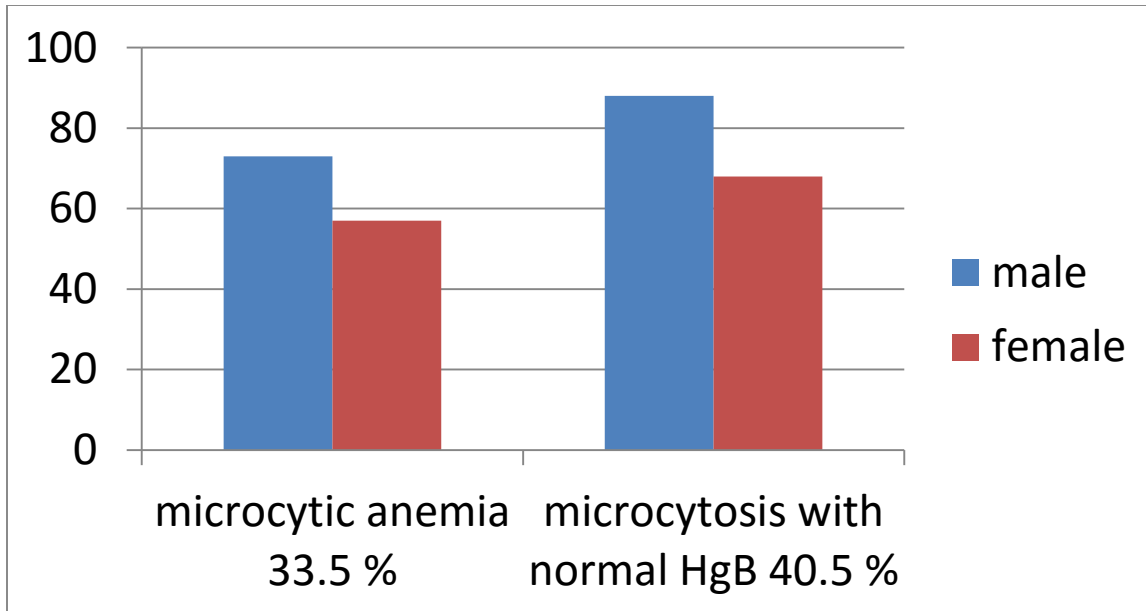
Chart (4.10) the percentage of microcytic anemia and microcytosis with normal Hgb from the total number of patients with CBC

Indeed patients with chronic illnesses are at risk of iron deficiency anemia, either due to the neglect that may have for example in case of Down syndrome or secondary to the failure to thrive that come with chronic illnesses for example congenital heart disease although these patients may have a combined iron deficiency anemia with anemia of chronic illnesses. During the analysis of these excluded patients from the study we find that 7 patients from 19 patients had anemia a percentage about 37 % of them.

Chronic illnesses with anemia

■ Anemic 7 Pts 37%
■ nonanemic 12 Pts 63 %
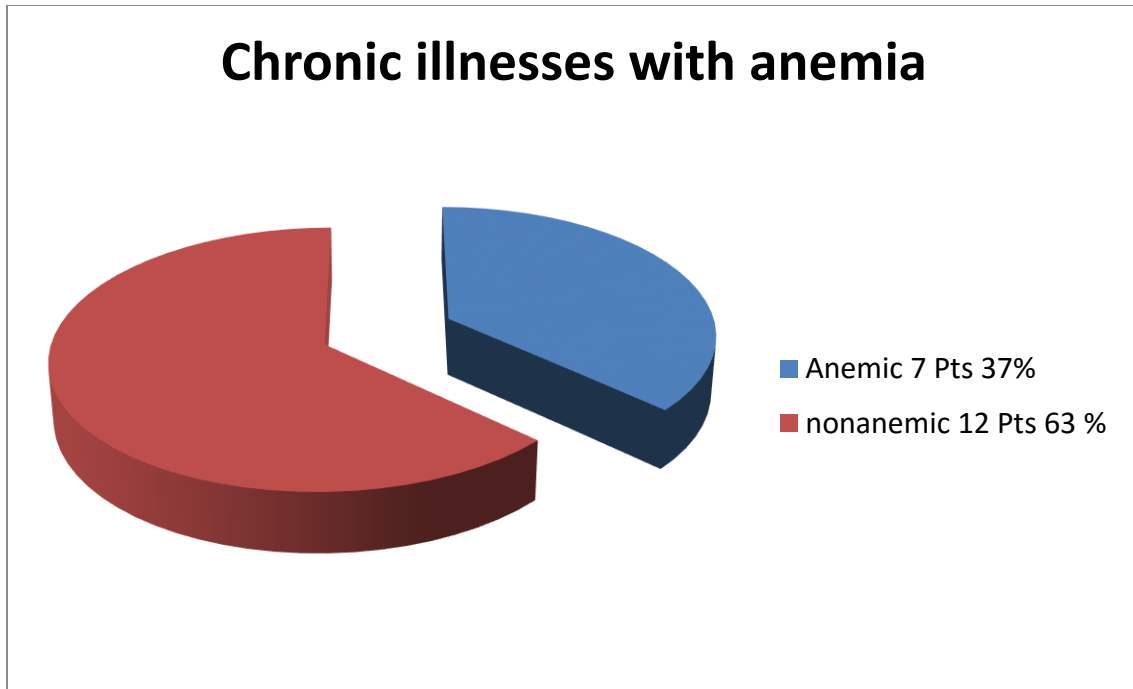
Chart (4.11) the percentage of anemia in patients with chronic illnesses

In comparison to the practice of detecting iron deficiency anemia before and after intervention. 60 patients with anemia were in the pre-intervention phase from 29/10/2014 – 11/11/2014 only one of them was discharged on iron treatment 1.5 % of them. In comparison to the post-intervention phase 13/11/2014-26/11/2014 86 patients were presented and 7 patients only (8%) of them were discharged on iron treatment. This emphasizes an increase in the rate of detecting and treating iron deficiency anemia from (1.5 %) to (8 %), although we were expecting a higher percentage.

before intervension

1 pt 1.5 %

■ on Iron Tx 1 Pt 1.5 %

■ no treatment 59 pt 98.5%

59 pt 98.5 %
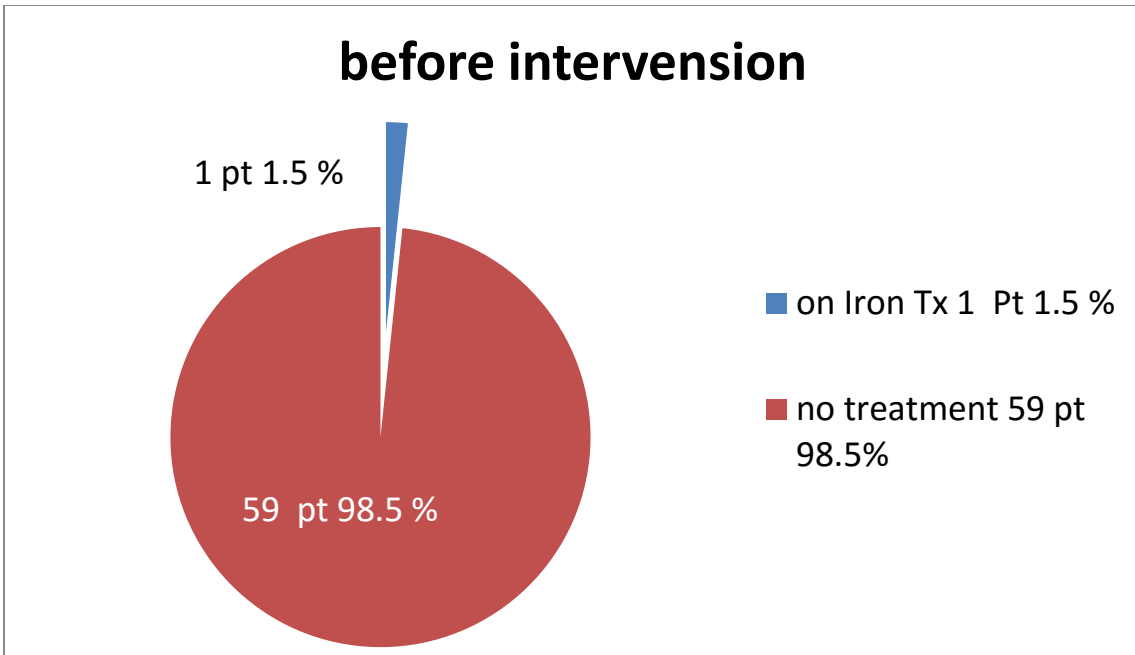
Chart (4.12) t he percentage of anemic patients that were discharged on iron therapy before intervention

after intervension

7 pts 8 %

■ on iron Tx 7 Pts 8 %
■ no Tx 79 pts 92 %

79 pts 92 %
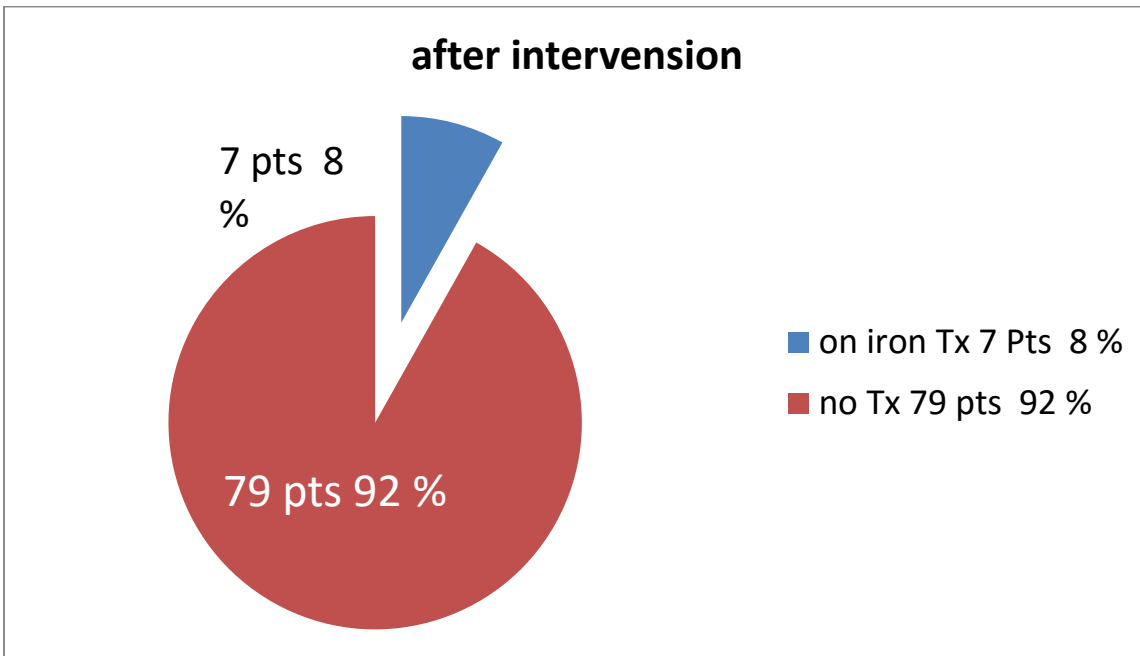
Chart (4.13) t he percentage of anemic patients that were discharged on iron therapy after intervention

In comparison about instruction to repeat CBC we found an increased in the percentage from one patient only from 60 patient before intervention (1.5 %)   to two patients from 86 after the intervention (2.3 %)
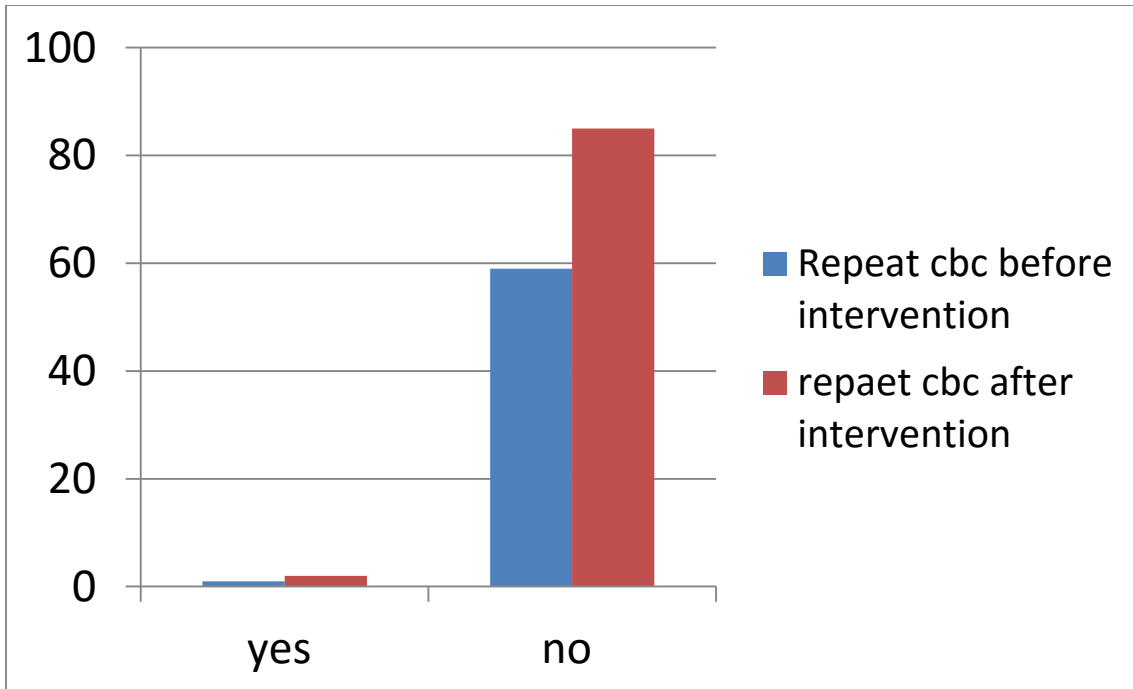
Chart (4.14) t he percentage of anemic patients that were discharged with instruction to repeat the CBC

No significant change in prophylaxis iron prescription as no one before intervention had a prophylaxis iron (0 %), and only one patient after intervention had (0.5%)
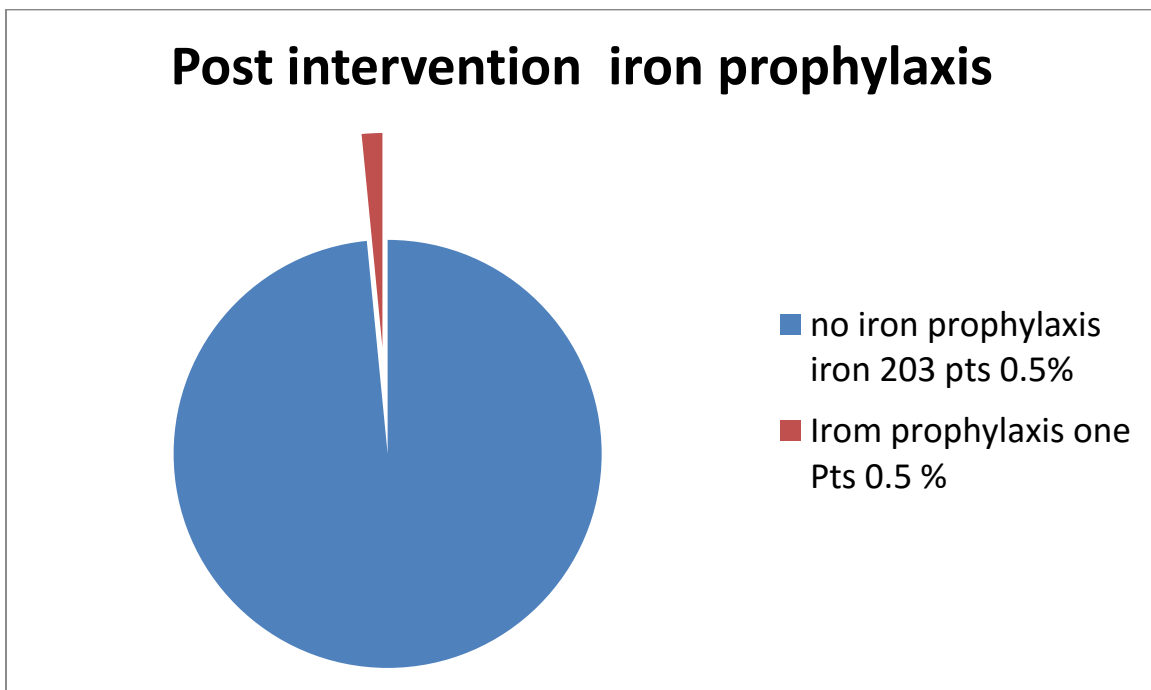
Post intervention iron prophylaxis

■ no iron prophylaxis iron 203 pts 0.5%

■ Irom prophylaxis one Pts 0.5 %

Chart (4.15) t he percentage of patients were discharged on prophylaxis iron therapy post intervention

For those who discharged on iron post intervention 30 has right dose, 30% wrong dose, 40 % the dose not written. For prophylaxis Tx the dose not written.

We found that the most chief complaint for asking CBC at ER was fever either isolated or associated with other complaints 250 patients out of 396 (63 %), followed by isolated cough 33 patients (8.5%)., abnormal movement with or without fever 18 patients (4.5%). Isolated vomiting 14 patients (3.5%) abdominal pain 6 patients 1.5%, the others are 19%.

causes for asking CBC

- ■ fever 63%
- ■ cough 8.5%
- ■ abnormal movement 4.5 %
- ■ vomiting 3.5 %
- ■ abdominal pain 1.5 %
- ■ others 19 %
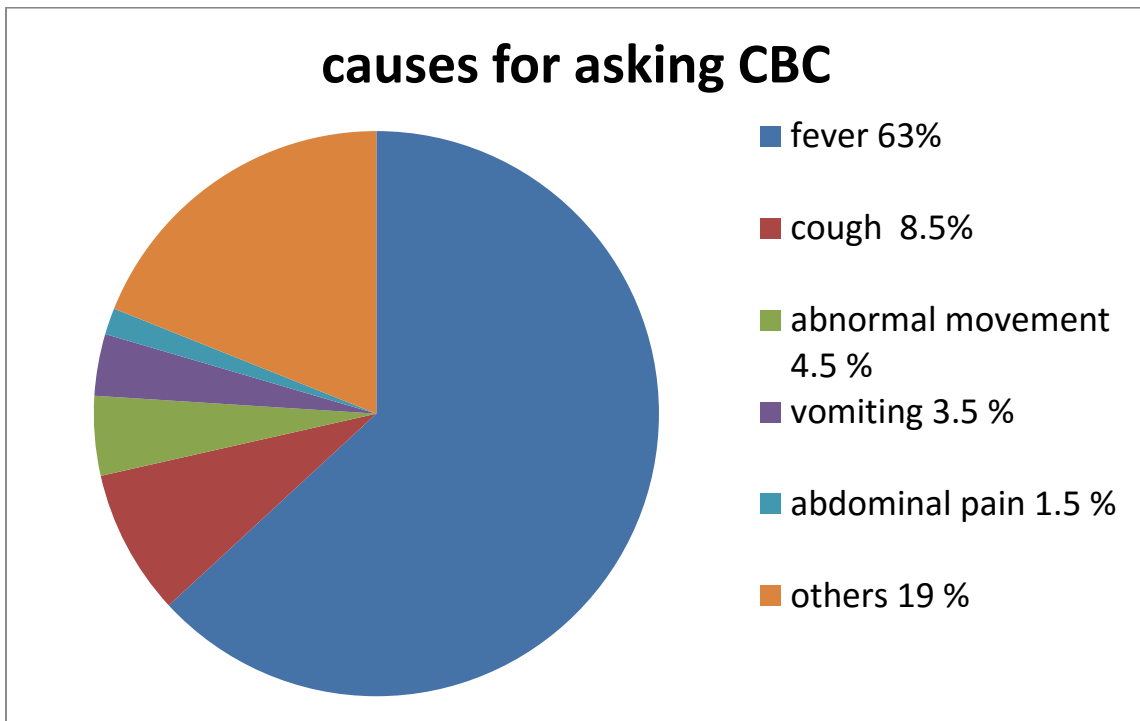
chart (4.16) The most common chief complaint for asking CBC

Chapter Five

Discussion

5.1 Introduction.

Many factors affect our study but as a matter of fact, it is in progress and we think when we will re audit the cycle again we will have a higher percentages of success, and we will create more policies and we will extend this study to many hospitals in our health system. In this chapter there will be discussion about the results and the limitations and the barriers that we faced in addition to putting recommendations for the health system, doctors and nurses and even all the medical team , for a great future that all dream of.

5.2 Main Findings of the Study

From a total number of 1155 aged between 6 -36 months old patients visited the emergency department 396 patients had CBC check 34%, only 4 CBC's were done for suspecting hematological conditions for example after trauma and bleeding to check for Hgb, this make us asking is it indicated to do CBC to all these patients !! And even when we do all these test , do we notice the abnormal values in it!!!

In our study we excluded 28 patients as the following ; the patients that had CBC check for hematological conditions, as we want to test for the nutritional iron deficiency anemia that is a result of food or the supplementation of Iron in the form of prophylaxis iron and according to the recommendations of pediatric group, or if the patients have a chronic illnesses to avoid other factors affecting Hgb, also we excluded the CBC that was done outside Ramallah hospital suggesting reliable CBC results on the same CBC machine at Ramallah hospital lab.

The percentage of anemia in children aged between 6 months and 36 months which is the period of increase growth and psychomotor development, with the increased demand of iron and other nutritional supplementation was 40 % from 368 patients had CBC test for other reason than hematological causes , from them 78 patients were male 52 % and 71 patients were female 48 %. With male to female ratio nearly 1.1:1.suggesting no significant changes in gender and that all our children are at risk of anemia.

130 patient had microcytic anemia a percentage 33.5 % of the total patient had CBC and 87 % of those who having anemia ,these percentages show that about one third of the emergency patients are anemic with evidence of iron deficiency. Still yes we are unable to determined that these results are pure iron deficiency or there is an element of thalassemia anemia is in place as no family history about thalassemia had been written in the questionnaire and always there was a focus on the acute illness that the patient had or even if there was a past medical history no doctor during data collection was noticed to write a family history either for thalassemia or other illnesses for the patients that are included in the study. This may be related to the missing detection of the anemia problem and consequently missing to ask about the cause of it.

72 % of anemia patients had mild anemia with Hgb 9.9-11 and 27 % had moderate anemia with Hgb 7-9.9, 10 % of them and 2 % from the total anemic children had had Hgb <8 making 2 % of all the anemic patients are at risk of developing severe anemia which showed a percentage of 0.5 % of the total, suggesting a need for immediate intervention and treatment to avoid the risk of severe anemia and its complication and the negative effect of anemia over growth and psychomotor development.

The average Hgb for anemic children was 10.1 which is in the mild anemia category, and also the average MCV in anemic children was 70.2 which is still in the accepted range of MCV (70-87) the Harriet lane [26], this rise the impression that we still able to do changes and create polices and protect against anemia in Palestine as most anemic children are in the mild anemia category according to the WHO classification.

On the other hand the average age of anemic children was 16.1 month old , suggesting that we have a sufficient time before reaching this age which is in the range age of rapid growth and development , for giving rich food with iron and supply Iron prophylaxis to the children.

Still we must concentrate on the patients that are at risk of having iron deficiency anemia, with the evidence if microcytosis and borderline hemoglobin indicating a state of possible iron deficiency, which is also affect the growth and psychomotor development even with the evidence of anemia, in or study 156 from the 368 patients (40.5) had evidence of microcytosis MCV < 78 and Hgb >11.

In our data analysis when we compared the result of the phase number one and the phase number three (pre and post-intervention) we didn't calculate in our analysis the cases of anemia in the day of intervention to improve the reliability of the study.

The total days before the day of intervention were 14 days with 60 anemic patient 41 % and total days after the intervention were also 14 days with 86 anemic patients 59 %

In comparison to these two groups of patients the percentage of detecting and treat anemia was only 1.5 % before the intervention which increased to 8 % after the intervention. On the other hand the percentage of giving instruction about repeating CBC was increased from 1.5 % to 2.3 % before and after intervention respectively. Only one

43

patient was discharged on prophylaxis iron in this study and he is in the post intervention group making an increase of the percentage of discharging the patient on prophylaxis iron from 0 to 0.5 %!! Before and after intervention respectively.

No documentations in the patients file were present about if they were given instruction about Iron rich food or even if the patient were referred to hematologist for further evaluation. No documentation also about if the baby who is less than 1 year in on breast feeding or not!

These findings may indicate either an ineffective intervention or a result of missing the detection and treatment of anemia in the everybody work in the emergency department, and by this we can accept the mild increase in the percentage of detecting and treat anemia and the mild increase in instruction about repeat CBC and about discharge the patients on iron prophylaxis. By this we expected a higher percentages if we will re-audit the cycle again and again in the same hospital, and also we can extend the problem to other governmental or ever private hospitals to make the problem prominent and increase the awareness out it either in the medical team and in the families.

Indeed we faced many problem in the different phases of this study, that may affect the strength of our intervention, first of all the delay in accepting this study to be started at Ramallah hospital, which make us unable to do many lectures as we decided to before we start in it , as we considered doing 2 lectures one at the begging of the intervention and the second after the first week to revaluate the practice. The other thing that there were people removed the postures from the emergency department and tried to hide the smaller pamphlet that we want to spread between families.

The other issue that should be raised here is that many resident as they claim didn't recognize anemia as an important problem and they didn't document if they discharged the patient on iron treatment or not, on the other side many of the resident in our health system not specifically in Ramallah hospital didn't take a full history in the emergency department due to the large number they are examine daily, in order to concentrate specifically of the acute illness that the patient come for , but in the other side they are missing to check the Hgb which is also a red alarm for malnutrition and neglect and risk on life in cases with severe anemia and we had one case of severe anemia not detected and four patient with moderate anemia with Hgb range 7-8 making them at risk of the sever anemia and its risks.

We found that the most chief complaint for asking CBC at ER was fever either isolated or associated with other complaints 250 patients out of 396 (63 %), followed by isolated cough 33 patients (8.5%)., abnormal movement with or without fever 18 patients (4.5%). Isolated vomiting 14 patients (3.5%) abdominal pain 6 patients 1.5%, the others are 19%. Making us to stop on this issue and create a polices for asking CBC and other labs for specific indications as needed

5.3 Ethical issue:

We tried to contact all the patients with sever and moderate anemia (41) patients. And advice them to come and repeat CBC and start on iron therapy and to be seen by hematologist for further anemia work up. Although we have success in bring back many patients to the hospital for management, the follow up was poor, as there is no policy in following up these patients; and so the patients will be lost in this mess. The other

limitation of communication was that not all the children has a phone or mobile number in their registration, and even there are many files without full address.

5.4 Recommendations

- We need to continue with audit and re-audit to improve practices in hospitals.

- Extending the study to include other hospitals in the Palestinian health system.

- We need to create polices and plan to improve detection of iron deficiency and decreased the missed opportunity in detecting and treating it. By:

  - Lectures to the staff about anemia and the importance of treating it.

  - Involve the medical staff in educational projects about anemia towered the medical staff itself or the community

  - Make continuous statistic and revaluation the clinical practice continuously.

- Increase the community awareness about the iron deficiency anemia by :

  - Make pamphlets and lectures about anemia at the primary health care centers

  - Start house visiting missions for education and evaluation, of how much the community aware of the problem. And to emphasize in these missions on the :

    - the importance of iron rich food, and the time to start it

    - the importance of avoiding the drinks that affect the absorption of iron example , tea ,Coca Cola , coffee

- - the importance of starting iron prophylaxis at age of 4 months for babies with breast feeding
  - the importance of checking the CBC in the period of 9-12 month of age to asses for anemia
  - We can emphasize about the importance f iron prophylaxis in each visit of the patient for vaccination making a chance of many educational advices during early developmental age.

- Increase the medical staff either in the emergency department to allow for a better time for communication and treatment and detection of Anemia or in the primary care to decrease the load on the nurse that is doing the vaccinations and provide better time in a better calm place for education and answering questions.

- Rise the importance of breast feeding especially in the 1st 4-6 months of life as the bioavailability of iron in breast milk is higher but at the same time we should as mentioned before start prophylaxis iron supplementation at age 4 month then transitioning to iron-fortified infant cereals[27]

- For infants younger than 12 months of age who are not breastfed or are partially breastfed, use only iron-fortified formulas (12 mg of iron per liter)[28]

- At age six months, encourage one feeding per day of foods rich in vitamin C (eg, citrus fruits and juices, cantaloupe, strawberries, tomatoes, and dark green vegetables).as it help in absorption of iron.[28]

- Avoid feeding unmodified (nonformula) cow's milk until age 12 months.[28][5][6]

- After age six months, or when developmentally ready, consider introducing pureed meats. The heme iron in meats is more bioavailable than nonheme iron and also increases the absorption of nonheme iron.[29]

- Children aged one to five years should consume no more than 600 mL (20 oz) of milk per day, as it may affect absorption and it interfere with eating iron rich food. [5] [6]

- For breastfed infants, an additional source of iron (complementary foods or iron supplement) should be added at the following doses and times:

  - Full-term: 1 mg/kg (maximum 15 mg), start iron supplements at four month continue until the infant is taking sufficient quantities of iron-rich complementary foods such as infant cereal.

  - Premature: 2 to 4 mg/kg (maximum 15 mg), start supplementation by one month of age in breastfed infants (as an iron supplement). Iron-fortified preterm formulas provide sufficient iron for most preterm infants without supplementation, although up to 14 percent of these infants will develop iron deficiency during the second six months of life

  - Children 1 to 3 years old: 7 mg/day.[30]

References .

(1)   Robert D. B, MD, PhD, Frank R. , MD, and THE comitte on nutrition. (2010). Clinical Report—Diagnosis and Prevention of Iron Deficiency and Iron-Deficiency Anemia in Infants and young children. *American Academy Of Pediatrics* , 1040- 1048.

(2) Palestinian Central Bureau of statistics. (the Eve of Palestinian Children's Day April 5, 2013). *the annual child statistics report on the occasion of Palestinian children's.* Ramallah-Palestine: Palestinian Central Bureau of Statistics, Survey Database.

(3) DeBenoist, B, McLean, E, Egli, I, et al. Cogswell,M. (2008). *Worldwide prevalence of anemia 1993-2005: WHO global database on anemia. Report.* Geneva: World Health Organization; Centers for Disease Control.

(4) KILLIP,S,BENNETT,J,M,CHAMBERS,M,D. (2007). *Iron Deficiency Anemia*. Retrieved from american family physician: http://www.aafp.org/afp/2007/0301/p671.html

(5) Hopkins D,Emmet P,Steer C,Rogers I,Noble S,Emond A. (2007). Infant feeding in second 6 month of life related to iron status, an observational study. *Arch Dis Child* , 850-854.

(6) Brotanek,J, MD, MPH;Halterman,J, MD, MPH;Auinger,P, MS,Flores,G, MD;Weitzman,M, MD. (2005). *Iron Deficiency, Prolonged Bottle-Feeding,and Racial/Ethnic Disparities in Young Children.* Retrieved from www.researchgate.net: file:///C:/Users/win/Downloads/Iron%20deficiency,%20prolonged%20bottle-feeding,%20and%20racial-ethnic%20disparities%20in%20young%20children..pdf

(7) Lerner NB, Sills R. In: Kliegman RM, Stanton BF, St. Geme JW III, et al., eds. (2011).

(8) Batra,J,Sood A. (2005). Iron deficiency anaemia: Effect on congnitive development in children: A review. *Indian J Clin Biochem* , 119-1125.
Beard.J. (2008). Why Iron Deficiency Is Important in Infant Development. *J Nutr. 2008* , 2534-2536.

(9) Beard.J 2008 Why Iron Deficiency Is Important in Infant Development, J Nutr. 2008, 2534-2536

(10) Georgieff,M. (2011). Long-term Brain and Behavioral Consequences of Early Iron Deficiency. *Nutr Rev* .

(11) Lozoff,B,Beard,J,Connor,J,Felt,B,Georgieff,M,Schallert,T. (2006). Long-Lasting Neural and Behavioral Effects of Iron deficiency anemia in infancy. (II)S34–S43.

(12) Verdon F1, Burnand B, Stubi CL, Bonard C, Graff M, Michaud A, Bischoff T, de Vevey M, Studer JP, Herzig L, Chapuis C, Tissot J, Pécoud A, Favrat B. (2003). *Iron supplementation for unexplained fatigue in non-anaemic women: double blind randomised placebo controlled trial*. Retrieved from PMC US national library of medicine: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC156009/

(13) Amin,SB,Orlando, M, Wang, H. (2013 Nov). Latent iron deficiency in utero is associated with abnormal auditory neural myelination in ≥ 35 weeks gestational age infants. *J Pediatr* , 163(5):1267-1276.

(14) Grantham-McGregor,S,Ani,C. (2001). A Review of Studies on the Effect of Iron Deficiency on Cognitive Development in Children. *The American Society for Nutritional Sciences* .

(15) Lozoff,B,Wolf,A,WElias Jimenez,E. (1996). Iron-deficiency anemia and infant development: Effects of extended oral iron therapy. *The journal of pediatrics,Volume 129, Issue 3* , 382–389.

(16) Donnadieu M, Schimpff RM, Garnier P, Chaussain JL, Job JC. (1980). A possible relationship between serum transferrin, growth hormone secretion and height velocity in children. *Acta Endocrinol* , 134-138.

(17) Franz,AR,Mihatsch,WA,Sander,S,Kron,M,Pohlandt,F. (2000 Oct). Prospective randomized trial of early versus late enteral iron supplementation in infants with a birth weight of less than 1301 grams. *Pediatrics* , 700-706.

(18) Steinmacher J, Pohlandt F, Bode H, Sander S, Kron M, Franz AR. (2007 sep). Randomized trial of early versus late enteral iron supplementation in infants with a birth weight of less than 1301 grams: neurocognitive development at 5.3 years' corrected age. *Pediatrics* , 538-546.

(19) Galan,P, Thibault, H, Preziosi, P, Hercberg, S. (1992 Jan-Mar). Interleukin 2 production in iron-deficient children. *Biol Trace Elem Res.* , 32:421-426.
(20) Daoud,AS, Batieha,A,Abu-Ekteish, F,Gharaibeh, N,Ajlouni, S,Hijazi, S. (2002). Iron status: a possible risk factor for the first febrile seizure. *Epilepsia* , 43(7):740-743.

(21) Palestinian National Authority. (march 2005). *Maternal and Child Nutrition Protocols.* Ramallah: ministry of health .

(22) Palestinian Central Bureau of Statistics. (January, 2003). *Child Nutrition in Exceptional Circumstances The Case of Palestinian Children Aged 6-59 Months in the.* Ramallah - Palestine: Palestinian Central Bureau of Statistics and Birzeit University/ICPH.

(23) Sirdah,M,Yaghi,A,Yaghi,A.R. (2014 Mar). Iron deficiency anemia among kindergarten children living in the marginalized areas of Gaza Strip, Palestine. *Rev Bras Hematol Hemoter* , 36(2): 132–138.

(24) Alzain,B. (Dec 2012). Anemia And Nutritional Status of Pre-School Children In North Gaza , Palestine. *INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 1, ISSUE 11* , 86-91.

(25) Odeh,M,. (2006). *Prevalence of Iron Deficiency Anemia among School Children in Salfeet District.* Nablus Palestine: An-Najah National University.

(26) Tschudy,M,Arcara,K. (2012). *the harriet lane handbook 19th edition.* philadelfia: Elsevier.

(27) Sutcliffe,TL,Khambalia,A,Westergard,S,Jacobson,S,Peer,M,Parkin,PC. (2006 Nov). Iron depletion is associated with daytime bottle-feeding in the second and third years of life. *Arch Pediatr Adolesc Med* , 160(11):1114-20.

(28) communityon nutrition (1999 Jul). Iron fortification of infant formulas. American Academy of Pediatrics. Committee on Nutrition. *Pediatrics* , 104(1 Pt 1):119-23.

(29) Fitch,CW,Cannon,MS,Seidel,GE,Krummel,DA. (2008 may). Dietary factors affecting iron status of children residing in rural West Virginia. *W V Med J* , 104(3):19-22.

(30) Abdelrazik,N,Al-Haggar, M,Al-Marsafawy,H,Abdel-Hadi, H,Al-Baz, R,Mostafa,AH. (2007 Aug). Impact of long-term oral iron supplementation in breast-fed infants. *Indian J Pediatr* , 74(8):739-45.

The appendices

The Questionnaire

Missed Opportunity in diagnosis Iron Deficiency Anemia in children (6-36 month old)

الاسم : _____ العمر : _____

رقم ملف الطوارئ : _____ التاريخ: _____

رقم الهاتف ان وجد: _____ العنوان : _____

ما هو وزن الطفل ان وجد: _____

هل لديه امراض مزمنة: نعم   لا

اذا كان نعم: ما هي : _____

هل يوجد تاريخ طبي في العائلة للثلاسيميا *positive family history of thalassemia*   نعم   لا   غير معروف

سبب قدومه الى الطوارئ : _____

هل تم عمل فحص دم داخل المستشفى   نعم   لا

هل تم عمل فحص دم خارج المستشفى نعم   لا

فحص الدم الخاص به *CBC* اذا كان قد عمل فحص دم داخل المستشفى

WBC :____ N _____ L____ **_HgB_** ___ **_MCV_** _____ RDW _____ RBC_____ HCT_____PLT ____

هل تم اعطاء المريض علاج لفقر الدم   نعم   لا

ما هي الجرعة التي تم اعطاؤها : _____

اذا كان نعم:➡هل تم اعطاء الاهل تعليمات لاعادة فحص الدم بعد شهر   نعم   لا

هل تم اعطاء الاهل تعليمات حول المشكلة وضرورة اخذ الاطعمة الغنية بالحديد   نعم   لا

اذا كان الطفل اقل من سنة: هل ياخذ رضاعة طبيعية   نعم   لا   غير معروف

اذا كان الطفل اقل من سنة : هل ياخذ حديد كوقاية *prophylaxis iron*نعم   لا

اذا كان لا ➡:   هل تم اعطاؤه حديد وقائي *prophylaxis iron*   نعم   لا

الجرعة التي تم عاطاؤها _____

هل تم عمل فحوصات اخرى لفقر الدم : نعم   لا

ما هي الفحوصات التي تم عملها _____

هل تم تحويل المريض لاخصائي دم *Hematologist*:   نعم   لا

The Questionnaire

Missed Opportunity in diagnosis Iron Deficiency Anemia in children (6-36 month old)

Name:_____   Age :_____

ER number _____ ___ date: _____

Phone number _____ address _____

Weight of the baby (if present)_____

Is there any chronic illness?   Yes   no

If yes; what is it?_____

positive family history of thalassemia /

Chief Complaint_____

Was CBC done at hospital   yes   no

Was CBC done outside the hospital   yes   no

CBC result if done at hospital

WBC :____ N ___ L____ *__HgB___* *__MCV__* _____ RDW __ RBC___HCT___PLT____

Was the patients given iron treatment   yes   no

   If yes; then what is the dose that was given _____

   If yes did he received instruction to repeat CBC   yes   no

   If yes , did the family received good instructions about the iron rich food   yes   no

If the baby less than 1 year , is he on breast feeding   yes   no   unknown

If the baby less than 1 year , is he on iron prophylaxis or not   yes   no

 If no did he receive iron prophylaxis   yes   no

        If yes what is the dose that was given _____

Was other labs ordered due to anemia   yes   no

    If yes what are the labs _____

Did the patient referred to hematologist _____
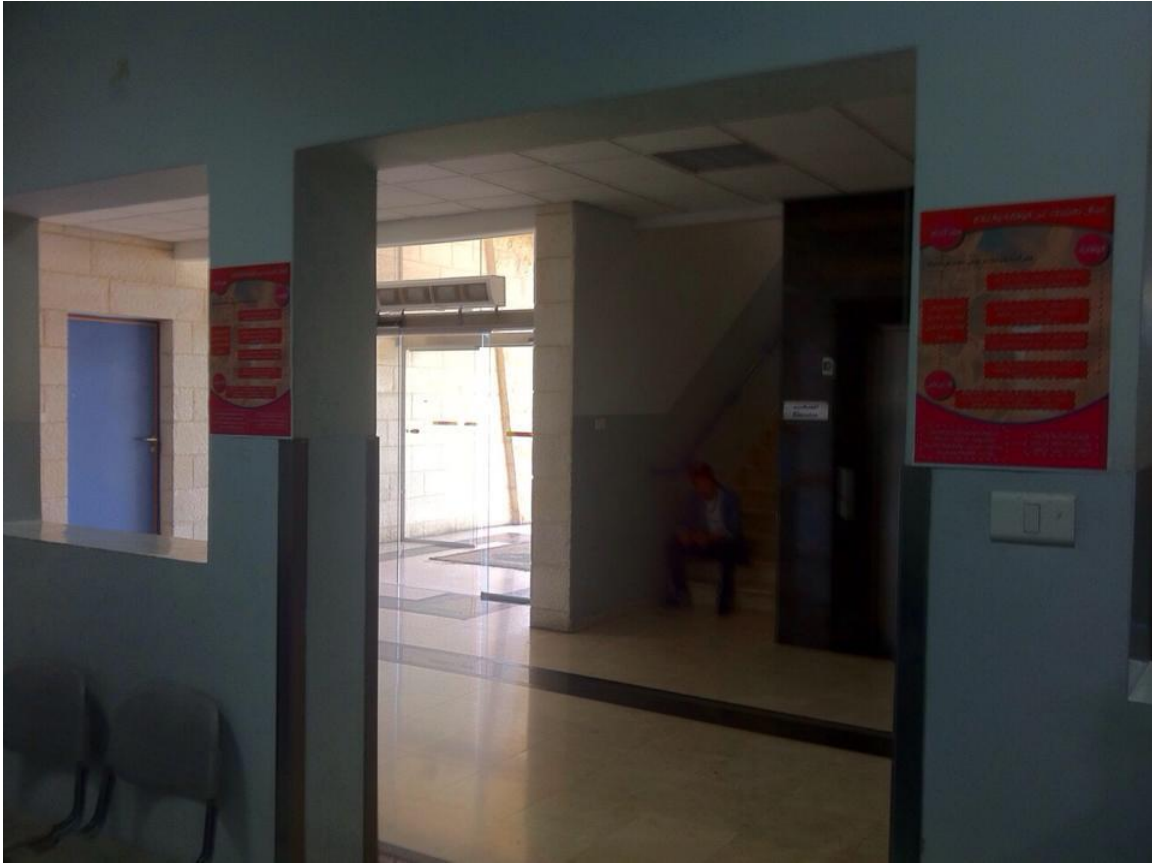
The intervention pictures

(pic-1) A poster on the emergency department entrance

(pic-2) The Medical prescriptions for iron.

(pic-3) The emergency room with posters and pamphlets of anemia on the walls

(Pic-4) anemia posters in the waiting room.

العنوان: إضاعة الفرصة في تشخيص أنيميا نقص الحديد لدى الأطفال

الذين تتراوح أعمارهم بين (6-36 شهرا)

إعداد الطالب: محمد علي الأعور

إشراف الدكتور حاتم خماش

الملخص

الخلفية : فقر الدم (الأنيميا) نتيجة نقص الحديد هو أحد أهم مؤشرات الصحة، و هو أكثر أنواع فقر الدم شيوعا في مرحلة الطفولة. حيث انه يؤثر على تطور الطفل الذهني والعصبي والجسمي. أما العرض الأكثر شيوعا لنقص الحديد وفقر الدم في مرحلة الرضع هو وجود طفل رضيع يبدو في حالة غذائية جيدة لكن فحص الدم لديه يشير إلى حالة خفيفة إلى معتدلة من فقر الدم الصغير الكريات و الناقص الصباغ، وهذا ما يجعل المسؤولية على الطاقم الطبي للكشف وعلاج فقر الدم نتيجة نقص الحديد.

الأهداف : 1) تقييم الفرص الضائعة في تشخيص أنيميا نقص الحديد بين الأطفال الذين تتراوح أعمارهم بين 6-36 شهرا خلال زيارتهم لقسم الطوارئ لإصابتهم بأمراض حادة. 2) إنشاء سياسات للكشف عن الأطفال المصابين والشروع في علاجهم في غرفة الطوارئ.

الأساليب: يتم إجراء هذا البحث باستخدام خطة المراجعة، من خلال دراسة وصفية لتقييم الكشف عن نقص الحديد في الدم خلال مراقبة فحص دم الذي تم إجراؤه للمرضى في قسم الطوارئ، ووصف العلاج, وإعطاء التعليمات عن أنواع الأغذية الغنية بالحديد. وذلك خلال مرحلتين زمنيتين مختلفتين قبل وبعد إجراء تدخل تثقيفي للطاقم الطبي من خلال (تدريس محاضرة عن الموضوع,و نشر ملصقات طبية عن أنيميا نقص الحديد ,وتوزيع وصفات طبية جاهزة للحديد في قسم الطوارئ). حيث كان خلال الفترة من 2014/10/29 و2014/11/26 في مجمع فلسطين الطبي.

المشاركون: مقيمي الأطفال وعددهم (12) في مجمع فلسطين الطبي خلال عملهم في قسم الطوارئ. و جميع الأطفال الذين تتراوح أعمارهم بين 6-36 شهرا خلال زيارتهم لقسم الطوارئ لإصابتهم بأمراض حادة, والذين تم عمل فحص دم لهم لأسباب مرضية غير الأسباب المتعلقة بأمراض الدم.

النتائج: من مجموع 1155 طفل تتراوح أعمارهم بين 6– 36 شهرا زاروا قسم الطوارئ خلال 4 أسابيع في الفترة من 2014/10/29 و2014/11/26 في مجمع فلسطين الطبي, تم عمل فحص دم ل (396 مريضا) (34٪). تم استبعاد (28) من المرضى. كانت نسبة فقر الدم 40٪ من 368 مريضا تم عمل فحص دم لهم لأسباب مرضية غير متعلقة بأمراض الدم. وكانت معظم حالات فقر الدم خفيفة بنسبة 72٪، متوسطة بنسبة 27٪، وكانت شديدة بنسبة 1٪. وكان متوسط أعمار الأطفال المصابين بفقر الدم 16.1 شهرا. وقد ارتفعت نسبة اكتشاف وعلاج فقر الدم من 1.5٪ قبل التدخل إلى 8٪ بعد التدخل.أما بالنسبة لإعطاء تعليمات حول أعادة فحص الدم فقد زادت من 1.5٪ إلى 2.3٪ قبل وبعد التدخل على التوالي .يوجد مريض واحد فقط تم إعطاؤه جرعة حديد وقائية في حين لم يتم العثور على أي تدوين في ملفات المرضى عن وجود أي تاريخ عائلي لمرض الثلاسيميا،وأيضا لم يوجد تدوين فيما إذا تم إعطاء أي تعليمات حول الأغذية الغنية بالحديد أو إذا تم تحويل المريض لأخصائي أمراض الدم لمزيد من التقييم

الخلاصة: تم العثور على نسبة كبيرة من فقر الدم بسبب نقص الحديد في الفئة المستهدفة. على الرغم من أن معظم الحالات كانت من فقر الدم الخفيف.يوجد العديد من الفرص الضائعة لتشخيص وبدء العلاج. عملية التدخل الذي تم إجراؤه قد حسن الممارسة الطبية بشكل بسيط جدا.

توصية: نحن بحاجة إلى مواصلة التدقيق وإعادة التدقيق لتحسين الممارسات في المستشفيات وخلق السياسات التي تزيد من وعي الفريق الطبي والمجتمع حول فقر الدم كمشكلة كبيرة في المجتمع.