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Childhood Anaemia in Ibn- Al-Atheir Paediatric Hospital in Mosul (Excluding Leukaemia)

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ABSTRACT

This study include (408) anaemic children (243 Male and 165 Female) with ratio (1.4: 1) their haemoglobin level was below 100 g/l.

They were admitted to Ibin-Al-Atheir paediatric hospital in Mosul from February till September 1997. Routine haematological tests were done and some special haematological tests were performed when indicated. Three hundred children 300 out of 408 (73.5%) were admitted because of infection. The most common type of anaemia was normochromic normocytic as (53.18%), the second anaemia type was hypochromic microcytic anaemia (32.11%), haemolytic anaemia represented (8.83%), the rest type of anaemia were normochromic macrocytic anaemia (5.14%) and dimorphic anaemia (0.74%).

While children below three years of age showed microcytic hypochromic anaemia of moderate type and 36 (8.83 %) suffered from haemolytic anaemia.

فقر الدم عند الاطفال الراقدين في مستشفى ابن الاثير في الموصل

(ماعدا مرضى اللوكيميا)

الملخص

اشتملت الدراسة على 408 طفلا مصابا بفقر الدم 243 من الـذكور و165 مـن الانـاث بنـسبة (1.4: 1) وقد ادخلوا مستشفى ابن الاثير للاطفال خلال فترة الدراسة وابتداء من الاول شباط ولغاية شهر ايلول لعام 1997.

تم جمع المعلومات السريرية (العمر، الجنس والاعراض السريرية) لكل مـريض ثـم اجريـت فحوصات الدم الكاملة لكل مريض حسب حاجته مع اجراء بعض الفحوصـات الخاصـة حيثمـا تطلـب اجراءها.

دلت النتائج ان 300 من اصل 408 من الاطفال والذين يشكلون نسبة 73.5% كان سبب دخـولهم المستشفى هو الالتهابات. كان اكثر انواع فقر الدم شيوعا هو فقر الدم سوي الاصـطباغ سـوي الخلايـا بنسبة (53.18%)، وكان شيوع فقر الدم قليل الصبغة صغير الحجم بالمرتبة الثانيـة بنـسبة 32.11 %

ومثل فقر الدم الانحلالي نسبة (8.83%) اما بقية الانواع فكانت فقر الدم سوي الصبغة كبير الحجم بنسبة (5.14%) وفقر الدم مختلف الشكل بنسبة (0.74%).

ووجد ايضا ان فقر الدم من نوع صغير الخلايا قليل الاصطباغ من نوع متوسط الشدة هو الاكثـر شيوعا لدى الاطفال الاقل من ثلاثة سنوات، ووجد ان 36 مريضا (8.83%) مصابا بفقر الدم التحللي.

INTRODUCTION

Childhood anaemia may be defined as a functionally best characterized by a haemoglobin concentration below normal and it is a disorder in which the patient suffer from tissue hypoxia, the consequence of low oxygen carrying capacity of the blood (William et al., 1995), or may be defined as a haemoglobin level below 10g/dL during infancy and 11g/dL thereafter (Peter and Martti, 1979).

Anaemia is not a disease by itself but it is a symptom of many other diseases. The commonest type of childhood anaemia is the hypochromic type in which the commonest cause is iron deficiency, the next variety is thalassaemia minor (Peter and Martti, 1979; Brown et al., 1972; George et al., 1973).

A normochromic normocytic anaemia is commonly associated with infections, chronic inflammation and secondary to other illnesses.

Vitamin B12 deficiency is thought to be rare in children.

Vitamin B12 deficiency in the foetuses and newborn infants if present is attributed to dificiency of Vitamin B12 in the women during pregnancy and the puerperium (Jadhar et al., 1962).

Megaloblastic anaemia of infancy in the west is commonly associated with folic acid deficiency (Jadhar et al., 1962).

PATIENTS AND METHODS

All patients admitted to IBN Al-Atheir paediatric hospital for various medical causes during 7 months, starting the first of February until the first of September 1997 and who were found anaemic with a haemoglobin level below the normal range with a total of (408) children (243 male and 165 female) with ratio (1.4: 1), (their mean age was 2.8 years with range of 2 months-12 years), were included in this study, (leukaemic cases were excluded).

Their clinical data were collected including main presenting features (pallor, jaundice, infection, gastro-enteritis, splenomegaly and hepatomegaly).

A 2.5 ml of venous blood was drawn into EDTA-tubes and routine blood tests including Hb, PCV, WBC, reticulocyte count were done. Leishmann's stained blood smears were done to study the red cell morphology. They were divided into 5 groups normochromic normocytic, hypochromic microcytic, normochromic macrocytic, haemolytic and dimorphic, accoding to their haematological data.

Special haematological tests susch as haemoglobin electrophoresis, sickling test and direct coombs test were done using standard methods (Dacie and Lewis, 1995).

RESULTS

During the period of study (408) children were found to be anaemia (leukaemic cases were excluded). Their ages range from (2 months – 12 years). There were 243 boys and 165 girls corresponding to ratio (1.4: 1).

The relationship between the age and types of anaemia are shown in Fig (1).

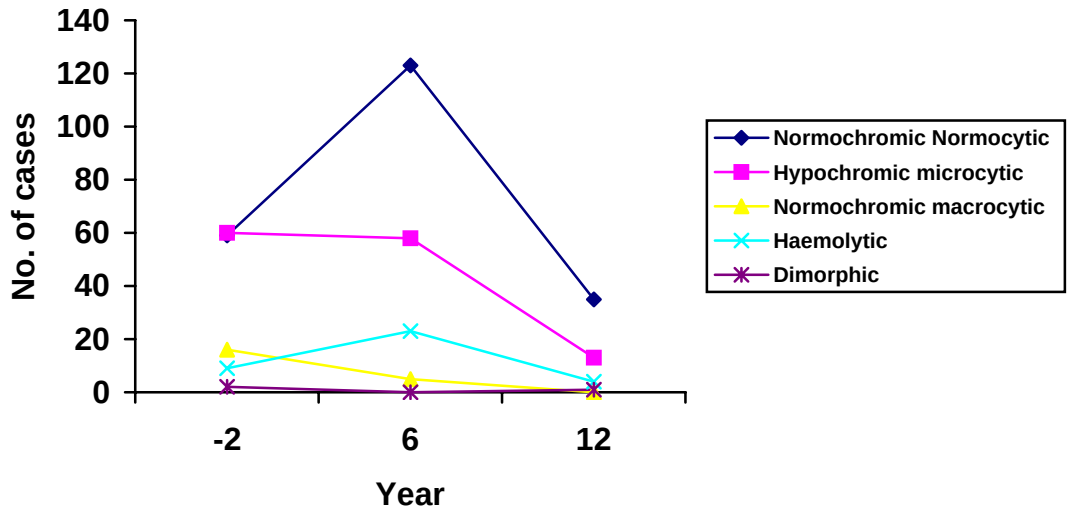

Fig 1: Age Distribution of different types of childhood anaemia.

Three hundred patients 300 (73.5%) were admitted because of infections (Chest infection, gastroenteritis) anaemia was found incidentally, 40 patients (13.3%) had shown pallor beside underlying infectious disease.

The remainder 108 (26.47%) were brought to the clinic because of pallor. Their haemoglobin concentration and packed cell volume, types and severity of anaemia are shown in (Table 1).

According to the haemoglobin level 182 (44.4%) had mild anaemia (Hb > 90 g/L), 189 (46.3%) had moderate type, 37 (9.3%) had severe anaemia (Hb < 60 g/L).

Thirty six of cases had haemolytic anaemia (Table 3). The type of anaemia in the remainder was classified according to the red cell morphology into: Hypochromic microcytic, normochromic normocytic, normochromic macrocytic and dimorphic. (Table 1) , (Table 3) and (Fig. 1) summarize the various parameters in each group. The diagnosis of thalassaemia major depended upon Hb electrophoresis which show Hb F ranged from 50-90%. The other 2 cases of haemolytic anaemia due to G6PD deficiency were diagonosed according to the clinical picture, blood film findings and proved by flouresent technique.

Table 1: Haematological Parameters of different types of childhood anaemia

		Normochromic normocytic	Hypochromic microcytic	normochromic macrocytic	Dimorphic
Total No. (%)		217 (53.18%)	131 (32.11%)	21 (5.14%)	3 (0.74%)
M: F ratio		1.4: 1	1.5: 1	2: 1	2: 1
Mean Age (year)		2.8	2.3	1.1	3.1
Mean ±SD	Hb g/L	95 ±54	84±15	69±2.3	75±1.9
	PCV L/L	0.298±0.041	0.284±0.057	0.235±0.073	0.27± 0.061
Severity (No.)	Mild	124	51	4	1
	Moderate	90	71	11	1
	Severe	3	9	6	1
Age Distibution (year)	-2	59	60	16	2
	-6	123	58	5	0
	-12	35	13	0	1

Table 2 : Subtypes of Haemolytic Anaemias.

Thalassaemia Major	Siekle Cell anaemia	G6PD Deficiency	Hereditary spherocytosis	Haemolytic uraemic syndrome
20	10	3	1	2

Table 3: Haematological parameters of Haemolytic childhoodanaemia.

Total No. (%)		36 (8.83%)
M: F ratio		1.1: 1
Mean Age (year)		2.8
Mean ± SD	Hb g/L	61.1±17
	PCV L/L	0.186 ±0.0602
Severity (No.)	Mild	2
	Moderate	16
	Severe	18
Age Distibution (year)	-2	9
	-6	23
	-12	4

DISCUSSION

Anaemia in general is a common paediatric problem in the topics up to 80% of children, young adult females and pregnant mothers have anaemia (Aaron and Josephia, 1974) this is because of increased demands and excessive losses or both.

Generally anaemia is thought to predispose to infections (Aaron and Josephia, 1974).

The vast majority of cases are associated with iron deficiency anaemia particularly between the ages of one and three years and is mild in type (Peter and Martti, 1979).

In this study 131 (32.1%), of all cases had a hypochromic microcytic red cell morphology a picture very suggestive of iron deficiency anaemia. The age distribution was shown in Fig. (1).

As general hypochromic microcytic type of anaemia is the most common type of anaemia in the first 2 years of life (M: F = 1.5: 1),it mean that male were affected higher than female.

The reason for this variation is not clear, it may be attributed to economic and social factors such as prolonged breast feeding, delayed introduction of mixed feeding and the earlier medical consultation in cases of boys.

The majority of our patients had mild to moderate anaemia and this is in accordance with other studies done in the tropics (Aaron and Josephia, 1974).

Generally anaemia is associated with infections and chronic illnesses (Aaron and Josephia, 1974). The usual type of anaemia in such conditions in normochromic normocytic.

The pathogenesis is multifactorial including hypoproliferative marrow damages such as infiltration, fibrosis and aplasia, or reduced stimulation such as inflammation metabolic defect and renal disease (Harrison and Anthony, 1998).

In this study normochromic normocytic anaemia is the commonest type 217 (53.18%). The majority of our patients had mild to moderate anaemia and is more common in male and the severity of anaemia depend on the activity of the primary cause and it’s duration.

Cases of haemolytic anaemia 36 (8.8%) was thought to have a relatively high frequency due to high incidence of thalassaemia and sickle cell disease in our locality (Al-Haj Ahmad, 1998).

In this study 21 (5.14%) macrocytic anaemia was seen common below 2 years of life. In general the cause of macrocytic is due to vit. B12 or folic acid deficiency or both. Anaemia due to vitamin B12 deficiency is very rare during chilhood. Macrocytic anaemia due to folate deficiency is more common cause in children and associated with repeated infections prematurity and low birth weight (George et al., 1973).

REFERENCES

Aaron, E. J. and Josephia, M. M., 1974. Infections in Iron Deficency and other types of Anaemia in the Tropics., Lancet, Aug. Vol. 1, 314 p..

Al-Haj Ahmed, F. F., 1995. Haemoglobinopathies in Mosul., M. Sc. Thesis, College of Medicine, Mosul.

Brown, Lubin, B. Smith, R. and Oski, 1972. Prevalence of Anaemia among Preadolescent & Young Adolescent Urban Black Americans., J. Pediat, 81, pp. 714-718.

Dacie, J. V. and Lewis, S. M., 1995. Practical Haematology, 6th. Ed.

George, M., Owen, A. Harold, L. and Philip, J. G., 1973. Haemoglobin levels according to Age, Race, and Transferrin Saturation in Preschool Children of Comarable Socioeconomic State., J. Pediat, pp. 850-851.

Harrison, T. R. and Anthony, F. S., 1998. Harrison's Principle of Internal Medicine, 14th. Ed.

Jadhar, M. Webb, J. K.G., Vaishnava, S. and Baker, S. J., 1962. Vitamin B12 Deficiency in Indian Infants., Lancet, ol. 2: 903 p..

Peter, R. D. and Martti, A. S., 1979. Precentile Curves for Haemoglobin and red cell Volume Infancy & Childhood., J. Pediat, 94, pp. 26-31.

William, J. W., Beutler, E., Lichtman, M. A., Coller, B. and Kipps, T., 1995. Williams Haematology, 5th, ed. Library of Congress Cataloging in Publication Data.