ANEMIAS IN PROTEIN ENERGY MALNUTRITION

Thesis

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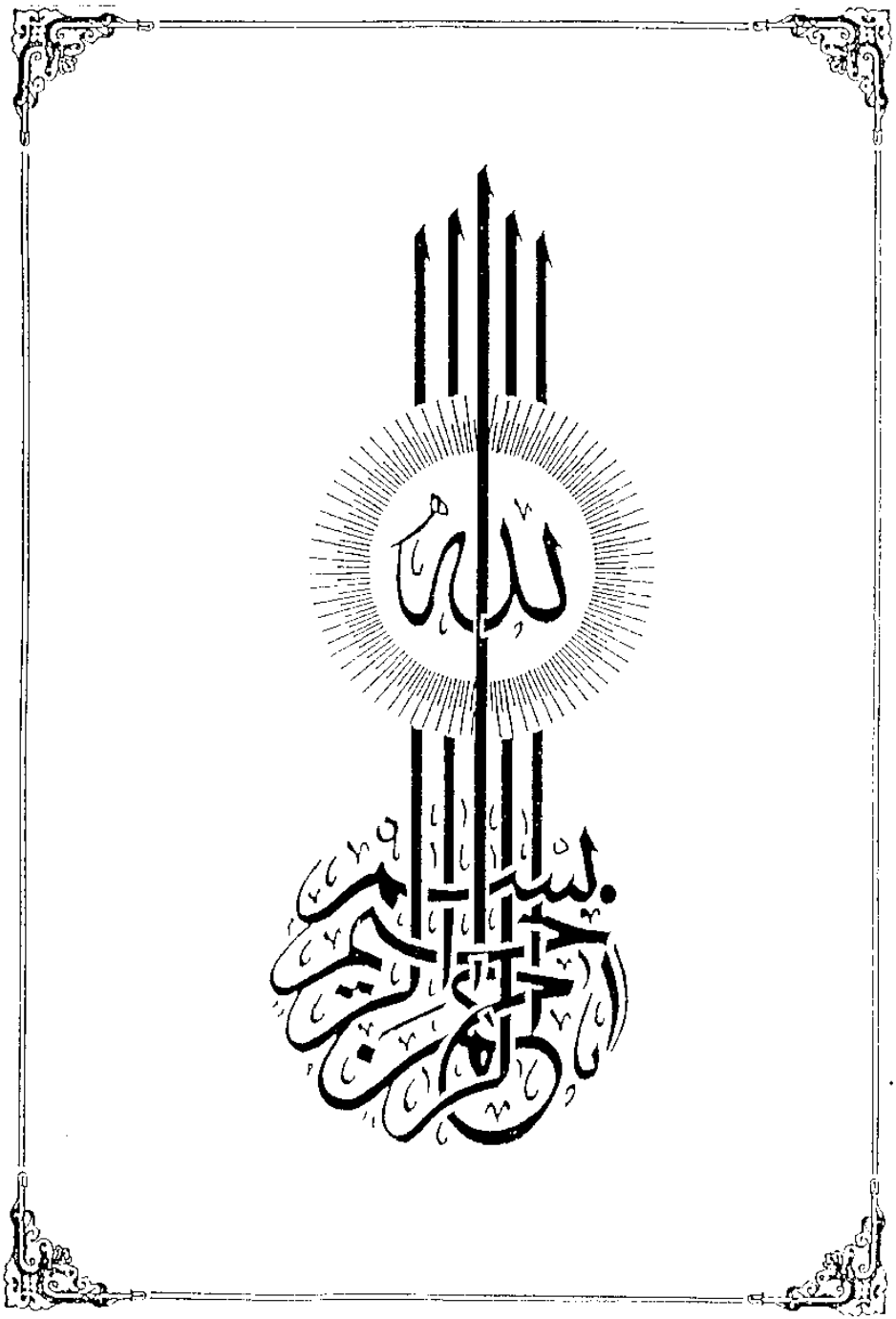
Emad Sobhi El-Shorafa



CONTENTS

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AIM OF THE WORK

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Protein energy malnutrition (P.E M) is one of the major problems in Egypt and other developing countries, and since anemia is one of the manifestations of such disease, we are intending to review the literature about anemia in P E M.

Our review will include:-

I) INTRODUCTION: Including:-

A. Definition of P E M and anemia.

B. Prevailence of P E M and incidence of anemia in P E M.

C. Types of anemia in P E M.

II) PATHOGENESIS OF ANEMIA IN P E M:

III) INVESTIGATIONS OF ANEMIA IN PEM.

Including:-

A. Peripheral blood picture.

B. Bone marrow picture.

C. Biochemical findings.

IV) MANAGEMENT OF ANEMIA IN PEM.

Including:-

A. Prevention.

B. Treatment.

INTRODUCTION

I) I N T R O D U C T I O N

A- DEFINITION OF PROTEIN ENERGY MALNUTRITION AND ANEMIA

In order to make this study of anemias in " Protein Energy Malnutrition" more explanatory and more understood, it may be of importance to give the definitions and some pathophysiological aspects of both anemia and protein calorie malnutrition.

Definition of Protein Energy Malnutrition :

Protein energy malnutrition (PEM) is defined by W,H.O (1973) as a range of pathological conditions arising from coincident lack, in varying proportions, of proteins and calories, occuring most frequently in infants and young children and commonly associated with infections.

PEM shows a wide spectrum which includes such advanced syndromes as Kwasiorkor at one end of spectrum and marasmus at the other end and in between there are inter-mediate grades where some cases show some manifestations of both marasmus and kwashiorkor and termed. accordingly, Marasmic-Kwashiorkor (Magotra et. al., 1976).

The Wellcome Working Party (Wellcome trust 1970) suggested a simple classification of PEM into four groups., undernourishment, Kwashiorkar, marasmus and marasmic-Kwashiorkor (Table 1).

Weight% of standard	Oedema	
	Present	Absent
80 - 60 %	Kwashiorkor	Undernourished
<60%	Marasmic Kwashi-orkor	Marasmus

Table (1): Wellcome classification

James (1977) emphasised that the distinction between the two extreme forms of protein energy malnutrition, Kwashiorkor and marasmus has been accepted by clinicans for many years. The syndrome of Kwashiorkor came to dominate the interest of tropical nutrionists when it was recognized after the second world war as a major cause of death in young children. Cases of Kwashiorkor occurs more frequently in children between 1-3 years of age and often presented after weaning.

James also stated that Marasmus occurred in Younger children than Kwashiorkor and when compared with a normal child the marasmic infant has a marked defecit in both weight and height.

Definition of Anemia :

In clinical practice, anaemia is usually defined as a haemoglobin concentration or packed cell volume .below the normal range which is usually defined by reference to population studies (Burman, 1981).

Haemoglobin levels vary widely in different countries, dependent upon nutritional status, the incidence of haemoglobinopathies and the incidence of such diseases as malaria and ancylostomiasis and therefore, in countries where all these factors are prevailent, it is difficult to determine what level is normal i.e. without disease being present (Burman 1981).

Probably the best data are those derived from the developed countries which have been summerized by Black and Barkhan (1974). The levels of Haemoglobin below which anemia should be diagnosed based on these data are shown in figures 1 and 2 and compared with W.H.O (1972)recommendations shown in Table 2 .

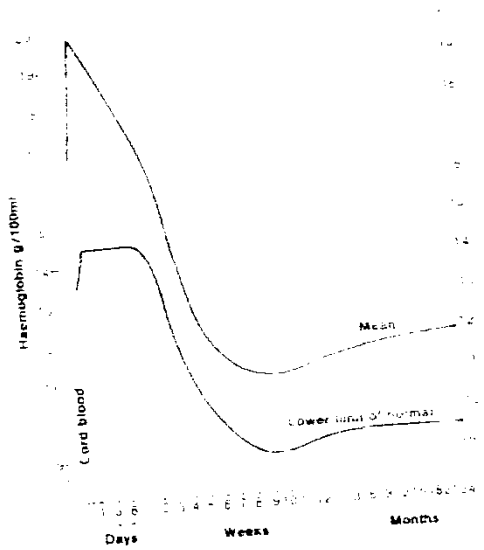

Fig.(1)
Haemoglobin concentrations in the first two years of life.(after Burman,1981). (Reproduced from Black and Barkhan,1974).

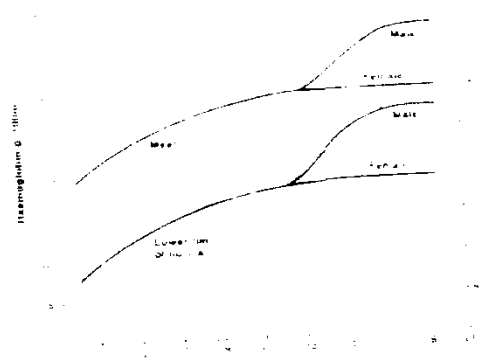

Fig. (2)
Haemoglobin concentrations between two years and adult life.(Reproduced from Black and Barkhan, 1974).

Age	Hb level according to W.H.O 1972	Age	Hb level according to Burman (1974)
6 months - 6 years	11	3 months-2 years	9.5
		2 - 5 years	10.5
6 - 14 years	12	5 - 9 years	11.0
Adult females	12	Girls 9-18 years	11.5
		Boys 9-13 years	11.5
Adult males	13	13 - 18 years	13.0

Table (2) : Recommended haemoglobin levels below which anemia is considered to be present (g/dl).
(After Burman 1981) .

However Fondu et al., (1978 a) had emphasised that the diagnosis of nutritional anemia is commonly based on three considerations:

1. The comparison of the haemoglobin level with a level arbitrarily regarded as the lower limit of normal,
2. The possibility of improving the hemoglobin level during treatment of the supposed defeciency,
3. or the probability of belonging to the lower of two populations extracted from the frequency distribution curve of hemoglobin.

Because of the particular charactersitics of PEM syndrone, these criteria are hardly applicable as the blood volume is lower than in well nourished children of the same height and also because the treatment of the protein energy malnutrition may reveal other defeciencies that will eventually prevent restoration of the normal hemoglobin level.

B- PREVALENCE OF PROTEIN ENERGY MALNUTRITION

It may be important to give a light upon the prevalence of protein energy malnutrition (PEM) particularly in Egypt as it represent one of the major problems in our community and one of the important causes of nutritional anemia.

Protein calorie malnutrition is widely spread disease, especially in developing and poor countries in Africa, also in Asia, Mexico, and South America(Walt et al; 1950) where the primary cause is due to pure calorie starvation resulting in marasmus or it is related to diet which may be reasonably adequate in total calorie value but is severely defecient in protein as in Kwashiorkor (Hutchison 1980).

PEM is rare to occur and may be overlooked in affluent developed countries (Lozoff.B, et al; 1975). PEM has been reported to be present in Italy(De Toni 1960) and also in United States (Sinatra et al; 1981) in which the aetiology is rather quite different from that in developing countries. Merrit et al (1979) found that PEM occurs primarily as a complication of underlying disease process rather than true malnutrition. Sinatra et al (1981) also stated

that PEM occurs as a result of food allergies or imbalanced food formulas leading to what is called iatrogenic Kwashiorkor.

Preschool children constitute a vulnerable population for developing nutritional disorders in general and protein energy malnutrition in particular (Magotra et al 1976).

In Egypt it is one of the serious health Problems, which showed it self in a field study carried in a rural community in Egypt called Sandion (Abdel-Hamid et al 1978). In this study the prevalence of PEM in infants and children of preschool age was 26.45% from which 75.99% were classified as underweight while 24.01% were belonging to severe forms of PEM.

Other studies done in another rural area in Egypt by Shukry et al; (1972)b showed a high percentage (73.7%) of infants in the first three months of life falling in the zone of accepted weight / Age (up to 91% of expected weight/age). This percentage sharply decreased to reach less than 20% of examined children in the second year of life.

This of course show that PEM is one of the main health problems in Egypt for which all possible efforts