

CHAPTER 2

INTRODUCTION

ANAEMIAS are extremely common. Their incidence has shown a progressive rise. Consequently, anaemias are one of the commonest and perplexing medical problems, the important contributory factors being the stress and strains of life as well as the high cost of living. It is because of these reasons that anaemias of varying degrees and of varying types are fairly widespread amongst the poorer classes of Indian population.

Variava (1953) has shown that there is a marked increase in the number of anaemia cases since the end of the war, and the anaemias are of more severe type. Simultaneously, it has also been shown that the increase is more marked in nutritional anaemias. Poor quality of diet is the most important solitary factor responsible for the causation of nutritional anaemias.

Optimum rainfall is the most important requirement for an agricultural country like India. Unfortunately, the rainfall in many parts of the country is either deficient or excessive producing floods, which bring about devastation and damage. Such state of affairs produce food deficiency and leave the people in poverty. Further, their low economic level reduces their nutritional state. To this was added the influx of the refugees from the partitioning of India. All these factors have added together, to make anaemias very common.

Surprisingly, iron deficiency is one of the most common human ailments, despite the fact that iron is the second most abundant element of the earth.

Iron deficiency anaemia is the most common type of anaemia in India. As a matter of fact, iron deficiency anaemia is one of the commonest diseases occurring with such frequency that it is too often presented to the physician for management. Fortunately, the physician has in his armamentarium an efficient agent to correct this disorder, and that is IRON.

Iron is essential for life. To the body, the iron is a precious metal which is carefully conserved. Iron as a therapeutic remedy for anaemia has been an age-long standby. Sydenham wrote, "We give Mars in the pale colours.... the pallor disappears and once again the face is rosy and rudy."

Since the important physiological functions of oxygen transport and cellular respiration are performed by haemoglobin, myoglobin, cytochrome and other enzyme systems, and iron is an essential component of these substances, the element is an indispensable constituent of the body. It has been rightly said that Iron provides the "Keystone of the arch" for the haemoglobin molecule.

In past it was believed that iron exerted a direct stimulating influence on red blood cell regeneration, but now it has been definitely proved that the medicinal value of the metal is limited only to deficiency states in the body to supply the demand for optimal haemoglobin production.

The presence of iron in blood was first demonstrated by Menghini as early as 1747, but it was only recently that much stress has been given to serum-iron level in health and its change in diseases. Such a change which can be either in terms of hypoferraemia or hyperferraemia has got not only the diagnostic importance but also the therapeutic importance. Moreover, serum iron estimation is one of the methods for studying the iron absorption.

A careful review of the literature on serum iron shows limited number of observations, specially in India. In the central part of our country little work has been done. Moreover, the results of such investigations undertaken

by different workers in India and abroad show close proximity in some and wide divergence in the others which may be due to multitude techniques employed.

Whatever little work on serum iron estimation that has been carried out in India (Indian subjects) is in relation with the Normal Subjects - either males or females or both. The serum iron values in Anaemic subjects, Indian or otherwise, are seldom found in the literature. The serum iron estimation studies in combination with Ferrotherapy in cases of iron deficiency anaemia is not undertaken so far even during the comparative clinical trials of different iron preparations. This important and interesting combined study is, therefore, undertaken in the present work.

Iron has been in use ever since its empirical applications in ancient times till the present day, when it is universally recognised as a specific form of therapy for iron deficiency anaemia. It is worthwhile mentioning that iron is practically specific provided that the anaemia is of true iron deficiency type, that a suitable preparation is selected, that the dosage administered is optimum and that no complicating factor exists whatsoever.

New iron preparations appear on the market from time to time. The flood of literature on the subject with clinical trials claiming greater effect and lesser irritability

then other iron preparations is impressive though contradictory. The practitioner is understandingly bewildered by the large number of claims and counter claims for the superiority of one preparation over the other.

The fact that there are many iron preparations available, itself indicates that, despite its specificity in iron deficiency anaemia, iron therapy still remains a therapeutic quiz.

Ferrous fumarate is a recent addition to the many oral iron compounds available for treating iron deficiency anaemia. It is desirable to know how the new iron preparation Ferrous Fumarate compares with pre-existing therapies. To commend itself for routine use, it should be at least as effective as, if not more, established drugs, and have fewer or no unpleasant side-effects, as well as being safe.

Shapleigh and Montgomery (1959) in their clinical trial comment on its advantages over Ferrous Sulphate and Ferrous Gluconate. Swan and Jewett (1959) using a new statistical method for evaluating the effectiveness of oral iron compound concluded that ferrous fumarate was a satisfactory therapeutic agent. Unfortunately, in neither instance was ferrous fumarate compared with other oral iron preparations. Rajsuriya et al. (1961), therefore for the first time, carried out a trial to compare Ferrous Fumarate with Ferrous Sulphate and Ferrous Succinate. They found no

difference between Ferrous Sulphate and Ferrous ~~Ferrum~~ Fumarate. They did not treat the hookworm infestation prior to the iron therapy nor did they adjust the doses of different iron compounds equal, in contrast to the present study.

There is diversity of opinion as to whether an electrocardiogram is abnormal or not in anaemia. Detailed electrocardiographic studies have also been made less frequently. Some workers have reported consistent electrocardiographic changes in severe anaemia. Others, however, did not observe any or only very insignificant electrocardiographic abnormalities in anaemia.

The historical aspect of electrocardiographic studies in anaemia is interesting. Electrocardiographic changes in anaemia were first mentioned by Ussoff in 1911. Later on Coombs (1926), Turner (1932), Szekely and Carter (1943) added their contributions.

Smith (1933), Pickering and Wayne (1934) and Misske and Otto (1937) did not observe any or only very insignificant electrocardiographic abnormalities in anaemia.

In 1936, Matteis studied electrocardiographic changes in 32 cases of anaemia. Out of these 32 cases, he found abnormalities, especially changes in T wave, in 18 cases i.e. in 56 per cent. In 1938, Bloch studied 88 cases of

anaemia, out of which he found abnormalities in 47 cases i.e. 53 per cent. In the electrocardiographic abnormalities he found most frequently flattening of T wave and less frequently depression of ST segment and low voltage. In 1950, Paul Wood reported a consecutive series of 20 cases with haemoglobin levels under 40 per cent, of which 8 i.e. 40 per cent showed low voltage, depressed ST segments and flat or inverted T waves.¹¹⁷

In India, a detailed study of electrocardiogram in anaemia with multiple chest leads was carried out only once so far in 1953 by V.V.Shah. Therefore, the interesting study of electrocardiographic changes in anaemia is also included in the present work.