

CHAPTER 30

C O N C L U S I O N

1. The method for Serum Iron Estimation, originally described by Marrack (1956) and MODIFIED during the course of the present study, is simple, sensitive, rapid, reliable, easily operable, producing consistent results and relatively economical.
2. The colour for spectrophotometric reading in serum iron estimation is STABLE for at least 24 hours (instead of only 1/2 hour time-limit described so far), if the samples after the colour development are preserved carefully by the method adopted during the present study.
3. 1 N HCl which is used for the first time in the present study, is quite efficient for rendering the

glassware iron-free.

4. Boiling, as recommended in the original method(Marrack 1956), is not at all necessary for rendering the glassware iron-free, and hence should be replaced by the method adopted in this study.
5. Use of gloves during the preparation of glassware, as employed for the first time in the present study, is essential for safety and hence extremely useful.
6. The Serum Iron values in Normal Subjects are as follows :
 - (a) Male : 150 - 250 mcg. per 100 ml. with a mean of 196 mcg. per 100 ml.
 - (b) Female:100 - 200 mcg. per 100 ml. with a mean of 148 mcg.
7. There is an overlapping in the Range of serum iron values of Normal Males and Normal Females but there is a difference in the mean values. Thus, the finding of lower serum iron values in normal females, as compared to those of normal males, is an agreement with other workers.
8. The Serum Iron Values in Anaemic Subjects are as follows :

(a) Male : 30-90 mcg. per 100 ml. with a mean of 61 mcg. per 100 ml.

(b) Female : 27-70 mcg. per 100 ml. with a mean of 46 mcg. per 100 ml.

9. There is an overlapping in the Range of serum iron values of Anaemic Males and Anaemic Females but there is a difference in the Mean values. Thus, the serum iron values are lower in Anaemic females also, as compared to those of anaemic males. (Such values of other workers are not found in the literature for comparison).
10. The serum iron values are lower in anaemic subjects as compared to those in Normal Subjects.
11. Serum Iron Estimation (on fasting samples) has diagnostic importance - values in iron deficiency anaemia have been found lower than normal in all the cases.
12. Serum Iron Estimation (4 Hours Samples after administration of iron) serves as iron absorption test by indicating the amount of iron absorbed. This helps in judging whether the particular iron preparation is going to be effective or not.
13. Serum iron estimation (8 hours samples) helps in judging the iron utilisation and particularly so if

the factor of increased urinary excretion is ruled out by simultaneous urinary iron estimation by using 0 hours (initial), 4 hours' and 8 hours' samples of urine.

14. Serum iron response to iron administration is greater on 1st day of treatment as compared to that on 21st day of treatment.
15. Serum Iron estimation is an useful tool in studying the peak response of iron preparation.
16. Peak level of serum iron reaches 4 hours after the administration of Ferrous Sulphate.
17. Peak level of serum iron reaches 4 hours after administration of Ferrous Fumarate.
18. Optical Density for 100 mcg. iron per 100 ml. is 0.035.
19. Average percentage rise of Haemoglobin per day after Ferrous Sulphate Administration is 1.290, and that after Ferrous Fumarate administration is 0.657 indicating that Ferrous Sulphate gives greater haemoglobin response.
20. Average percentage utilisation of iron after Ferrous Sulphate administration is 15.81 and that after Ferrous Fumarate administration is 8.730, indicating

that Ferrous Sulphate gives greater utilisation of iron.

21. Average M.C.H.C. rise per week after Ferrous Sulphate administration is 2.296, whereas that after ferrous fumarate administration is 1.140 indicating that Ferrous Sulphate gives greater M.C.H.C. rise.
22. M.C.H.C. rise is proportional to the Haemoglobin rise.
23. In response to iron therapy, haemoglobin rise is much more rapid than that of ~~ix~~ red cells.
24. All haematological responses after ferrous sulphate administration are greater than those after ferrous fumarate administration.
25. Haematological response to iron therapy (Ferrous sulphate or Ferrous Fumarate) is greater during the first week of treatment as compared to that during the 3rd week of treatment.
26. Ferrous Sulphate is well tolerated with a remarkable absence of gastro-intestinal side-effects.
27. Ferrous Fumarate is also well tolerated except for its occasional tendency to cause constipation.
28. The calculated cost of complete iron therapy in

iron deficiency anaemia with Ferrous Sulphate is much less than that with Ferrous Fumarate.

29. It appears that iron in Ferrous Fumarate form, though equally tolerable and little more absorbable, is not an ideal substitute for Ferrous Sulphate, not only because of its greater cost, but also because of its poor utilisation and consequent poor therapeutic value.
30. It is, therefore, found reasonable to conclude that the time-honoured Ferrous Sulphate still maintains its position as a satisfactory therapeutic agent and remains the oral iron preparation of choice for the treatment of iron deficiency anaemia.
31. Estimation of elemental iron per tablet of iron preparation is an important and useful procedure in confirming the Dosage-Equality of two different iron preparations under comparative clinical therapeutic trials.
32. Cases of severe anaemia at times show important electrocardiographic changes like sinus tachycardia, low voltage, abnormal ST segment and abnormal T wave.
33. Abnormal ST segments and abnormal T waves resembling coronary insufficiency pattern or resembling cardiac infarction pattern are found in a few cases of

severe anaemia. These findings are in agreement with those of the other workers.

34. Enlarged heart is usually associated with abnormal electrocardiogram, and greater the enlargement, more marked are the electrocardiographic changes.
35. Heart size and electrocardiogram may be normal in severe anaemia.
36. Ankylostomiasis in uncomplicated cases is found to produce typical hypochromic microcytic anaemia which is so characteristic of iron deficiency anaemia.
37. In cases of anaemia with ankylostomiasis, it appears reasonable to carry out the irradiation of parasites BEFORE starting a comparative clinical trial of two different iron preparations.
38. Tetrachlorethylene is safe and advantageous for "prior deworming". It does not give rise to any significant toxicity even in patients with severe anaemia.
39. Important aetiological factors ~~for~~ iron deficiency anaemia are :
 - (a) Diet poor in iron and rich in phytate.
 - (b) Hook worm infection with associated bare-footedness particularly in farmers.
 - (c) Dermal loss of iron due to excessive perspiration in a tropical place like Baroda.
 - (d) Repeated ~~and~~ consumption of drugs like salicylates

40. As regards the correlation between Edema, Anaemia and Hypoproteinemia, it is found that Edema is neither related directly to severity of anaemia nor it is directly related to severity of hypoproteinemia. Thus, all cases of anaemia with hypoproteinemia do not necessarily show edema.