5. SUMMARY AND CONCLUSION
In this study the iron status of non pregnant, non lactating Indian women assessed and the effect of different doses of iron supplements on the iron status and physical work capacity of the anaemic women was studied.

It was observed that out of 520 subjects studied, 297 (57%) subjects were anaemic with Hb level less than 12 g/dl. All the indicators of iron status (Hb, SI, TIBC, TS AND SF) were significantly lower in anaemics compared to non anaemics. The mean values in non anaemics and anaemics were (Hb 12.9 and 10.1 g/dl, SI 57.1 and 47.1 mcg/dl, TIBC 391 and 426 mcg/dl, TS 13.9 and 11.1 % and SF 34.2 and 25.3 mcg/L respectively) noted. A highly significant correlation was observed between all the biochemical indicators of iron status (P<0.001). The highest correlation of haemoglobin was observed with serum iron (0.7) and lowest with serum ferritin (0.56).

In this study it was observed that anaemia was more prevalent in the age group of 15 to 25 years. Twelve percent of the subjects in this age group were suffering from severe anaemia (Hb<8 g/dl), while in other age groups mild to moderate anaemia (Hb levels between 8 and 11.9 g/dl) were more prevalent rather than severe.

The mean height and weight of the anaemic subjects were 151.1 cms and 52.5 kg respectively compared to non anaemics (152.6 cms and 51.8
The anaemic subjects were tend to be shorter and slightly heavier than the non anaemic subjects. All the indicators of iron status (Hb, SI, TIBC, TS and SF) showed a significant correlation with height and weight of the subjects, while the relationship of B.M.I. was weaker and statistically significant only for Hb, SI and TS.

The physical work capacity of the anaemic subjects (No of steps taken 28, Recovery time 2.79 minutes and Increase in Pulse rate 30.5 respectively) was lower than that of non anaemic subjects (No of steps taken 29.4, Recovery time 2.73 minutes and Increase in Pulse rate 29.4 respectively).

A highly significant association between different biochemical indicators of iron status and the number of steps taken on the Harvard Step Test was noted. The recovery time showed a positive correlation with the haemoglobin (r=0.21, P<0.001) and transferrin saturation (r=0.28, P<0.001), while the increase in pulse rate showed an association only with TIBC (r=0.21, P<0.01).

The dietary data shows that the mean calorie and other nutrient intake (protein, iron and vitamin C) were significantly lower than their RDA's in both anaemic and non anaemic groups. Though no significant difference was noted in the calorie and other nutrients intake in both the groups, significant correlation between these and other biochemical indicators of iron status was observed. The association between these were highest with calorie intake followed by protein and iron. The intake of iron in their diet were less than 80% of the RDA's in both the anaemics and non anaemics.
When different doses of iron supplements (25 mg, 35 mg, 50 mg and 115 mg of element iron) were given to anaemic women divided into four groups, a significant improvement in all the indicators of iron status was observed. The mean haemoglobin levels of anaemic subjects increased by (+2.3 to 5 g/dl), SI (+22.4 to 45.4 mcg/dl), TIBC (-68 to -79 mcg/dl), TS (+8.6 to +16.4 %) and SF (+27.7 to 35.6 mcg/dl respectively) was observed.

The highest increase in most biochemical variables were seen with 115 mg of elemental iron. However, the response did not appear to be dose related. The results suggest that the higher dose is most effective for improving the iron status and building the iron stores in anaemic subjects compared to the lower doses studied. Same trends suggested by the PWC. It was the 115 mg dose which showed the maximum increase in the number of steps taken, while increase in pulse rate and recovery time was lowest on the Harvard Step Test. The improvement in PWC however was not related to the dose of elemental iron given.

Supplementation with different doses of iron significantly improved the PWC of anaemic subjects. The increase in no of steps taken ranged from 27.8 to 32.0, while the decrease in pulse rate ranged from 3.3 to 1.7 minutes and recovery time ranged from 33.2 to 19.3.

The percentage of subjects reporting side effects was only 11.1% with 115 mg dose compared to 10.4% observed with the lowest dose of 25 mg of elemental iron. This suggests that acceptability is not a problem with the higher dose of 115 mg of elemental iron.

A comparison of 50 mg of ordinary elemental iron (ferrous sulphate) with time release dose (55 mg of iron) was observed. The changes in
haemoglobin, serum iron and TIBC were slightly lower with time release preparation. However, this resulted in better iron store than with 50 mg of ordinary dose. Though a good clinical response of slow release preparation has been reported by other workers, it was not so in this study. The time release preparation was not very well tolerated.

Though time release dose appears to be a better iron store, the acceptability was very poor, may be due to the cause of side effects. The acceptability of iron supplements can be influenced by the form in which it is given. The results not only suggest the increase in hematological and biochemical parameter of anaemic subjects after supplementation but also their performance (on Harvard Step Test) was significantly better by the increase in number of steps, reduction in the post exercise pulse rate and reduced recovery time.

The results of this study suggested a high prevalence of anaemia though of a relatively mild degree. This indicate that for a good hematinic response of iron supplementation, higher doses of elemental iron are required. This not only helps in improving the haemoglobin level but also builds up the body stores of iron as suggested by serum ferritin.