STUDY OF SERUM IRON,TIBC & SERUM FERRITIN LEVELS IN RURAL WOMEN SUFFERING FROM IRON DEFICIENCY ANEMIA

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ABSTRACT- Iron deficiency is the most common nutritional disorder in the world .It affects particularly women of reproductive age and constitutes a major health issue in many developing countries. The aim of the present study is to investigate the levels of Haemoglobin, serum iron, TIBC, serum ferritin in women of reproductive age group suffering from iron deficiency anaemia. There is significant difference in serum iron values among cases & controls with mean serum iron value of 18.6326± 6.05080 in cases & 69.0408±23.5248 in controls. There is significant difference in Hb values among cases & controls, with mean Hb value of 11.6184±0.9064,among controls & 6.544±1.5992 in cases. There is significant difference in TIBC values among cases & controls, with mean TIBC value of 447.245+31.3166 among cases & 340.7347 + 30.4451 in controls.There is significant difference in serum ferritin values among cases & controls, with mean serum ferritin value of 13.6747±38.2765 among cases & 61.4241 ± 56.4806 among controls.The normal physiologic iron losses among menstruating women make it inevitable for many women to develop anaemia if they do not receive supplemental iron. In developing countries, anaemia is often aggravated by repeated &and closely spaced pregnancies as well as by intestinal parasites. Well documented consequences of anaemia include diminished learning ability, reduced work capacity increase morbidity from infections and greater risk of death associated with pregnancy &child birth.Serum ferritin is the index of total body iron stores, whose levels predicts the events of iron deficiency anaemia & other infections .Serum ferritin level is decreased in iron deficiency anaemia where as it remains in normal range in some infections & sometimes it may be highly increased in the cases of chronic inflammatory disorders, infections, neoplastic disease & in chronic renal failure, there is a disproportionate increase in serum ferritin levels in relation to iron stores. TIBC is increased in(>420µg/dl) in iron deficiency but these values may fluctuate in a number of common clinical conditions and hence are less reliable indicators of iron stores than the serum ferritin. Serum iron is usually low (<50µg/dl).This in combination with serum ferritin, gives appropriate results of iron deficiency anaemia than single.

Key Words:TIBC- Total iron binding capacity.

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1 INTRODUCTION

Iron deficiency anaemia is a most common disorder which occurs mostly in women of pre-menopausal age. It occurs mostly in women of rural areas who are suffering from poverty. Most of them are suffering from malnutrition, which is a primary cause of development of iron deficiency anaemia. The secondary cause of iron deficiency anaemia is excess blood loss during menstrual cycle. Most of the women in rural areas are working as farmers,factory workers, tailors, their earning is low and the family members are more so they depend on cheaper foods which are of less nutritive value.

Iron is essential to life to serve as both electron donor and electron acceptor. Iron deficiency anaemia is one of the most wide spread diseases all over the world.

In India 5-6% of general population suffers from this disease. It is prevalent in 3% among men & 10-14% among women.In specific groups like slum dwellers, plantation labourers& pregnant women the prevalence rate is 30-50% or even more.

A low serum iron & ferritin with an elevated TIBC are diagnostic of iron deficiency. While a low serum ferritin is virtually diagnostic of iron deficiency, a normal serum ferritin can be seen in patients who are deficient in iron & have co existent diseases (Hepatitis, anaemia of chronic disorders).The test findings are useful in distinguishing iron deficiency from other microcytic anaemia's.

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2 AIMS AND OBJECTIVES

a. To assess the cause of iron deficiency anaemia in reproductive age group women of rural areas.

b. To determine the Haemoglobin levels of blood & also to determine the changes of serum iron, TIBC, serum Ferritin in reproductive age group women of rural areas who are suffering from iron deficiency anaemia.

3 MATERIALS AND METHODS

The study was a hospital based study conducted at NRI Medical College& General Hospital Guntur District,AndhraPradesh

A case control type study was done on patients who attended the out patient departmentsin this hospital.

3.1 SOURCES OF DATA

a. INCLUSION CRITERIA

1) 50 women of rural areas & are of age group 15-45 years who are suffering from iron deficiency anaemia (microcytic hypochromic) with Hb<10 gms are selected for this study.as cases.

2) 50 women of same age who are not suffering from iron deficiency anaemia (Hb>10gm%) are selected as controls for this study.

3) Only rural areas women of reproductive age are selected for this study because of prevalence of iron deficiency anaemia is more in them when compared to urban population.

b. EXCLUSION CRITERIA

1) Women who are suffering from liver diseases & pregnant women are excluded from this study.

3.2 SPECIMEN COLLECTION:

Blood samples were collected from cases & controls & the samples are centrifuged for the estimation of serum iron, TIBC, ferritin levels.

3.3 HAEMOGLOBIN DETERMINATION

Haemoglobin is determined by Aperture Impedence method.

Principle: The number of pulsar is eqvivalent to the no. of cells passing through the orifice during the period

3.4 DETERMINATION OF SERUM IRON

PHOTOMETRIC COLORIMETRIC TEST FOR IRON WITH LIPID CLEARING FACTOR (LCF) BY CHROMOAZURAL B (CAB) METHOD

AIM: To determine the amount of iron present in the serum by chromoazural b method.

PRINCIPLE: Iron III reacts with chromoazural b (CAB) &cetyltrimethyl ammonium bromide (CTMA) to form a coloured ternary complex with an absorbance maximum at 623 nm. The intensity of the colour produced is directly proportional to the concentration of iron in the sample.

The test can also be used in combination with the TIBC kit (ref 10670)

CONTENTS:

TABLE-1

RGT	2 X 30mlor 2 x 100ml CAB reagent
CAB	0.18mmol/l
CTMA	2.2 mmol/l
GUANIDIUM BROMIDE	2.6mmol/l
Sodium acetate buffer	45mmol/l
STD	5ml standard 100µg/dl
Iron(ionized0	17.9µmol/l

REAGENT STABILITY:

RGT is stable even after opening up to the stated expiry date when stored at 2….25˚c

Contamination of the reagents is absolutely avoided.

SPECIMEN:

Serum or heparinisedplasma.

Do not use EDTA plasma, CITRATE plasma or haemolytic sera.

NOTE:

Lipemic specimens usually generate turbidity of the sample reagent mixture which leads to false high results.

ASSAY: Wavelength: 623nm,Hg 623nm.

Optical path: 1 cm

Temperature: 20-25˚c

Measurement: Against reagent blank (Rb).

Only one reagent blank per series is required.

PIPETTING SCHEME:

TABLE-2

PIPETTE INTO CUVETTES	Reagent blank	Sample/STD
Sample/STD	---	50µl
Distilled water	50µl	---
RGT	1000µL	1000µl
Mix well, incubate for 15 min at 20˚c….25˚c.Measure the absorbance of the sample (ΔA sample)and the standard (ΔA std) against the reagent blank within 60 min.		

CALCULATION OF THE IRON CONCENTRATION WITH STANDARD:

If a different wavelength (620nm-640nm)is to be used for measurement the standard provided with the kit has to be employed for the calculation.

$$C = 10 \times \frac{\Delta A \text{ Sample}}{\Delta A \text{ STD}} \quad \mu g/dl.$$

$$C = 17.9 \times \frac{\Delta A \text{ sample}}{\Delta A \text{ STD}} \quad \mu \text{ mol/l}$$

This test is linear up to an iron concentration of 500µg/dl or 89.5µmol/l.

REFERENCE VALUES:

MALE: 59-148 µg/dl or 10.6-28.3µ mol/l.

FEMALE: 37-145µg/dl or 6.6µ mol/l.

STANDARDIZATION:

Standard provided in the kit is used.

Standard 1:1 dilution = STD50ml + water 50 ml→50µl =25µg.

3.5 TOTAL IRON BINDING CAPACITY

AIM: To determine the Total iron binding capacity.

PRINCIPLE: The iron binding protein transferrin in serum is saturated upon treatment with excess of FE(III)ions. Unbound (excess) iron is adsorbed onto aluminium oxide and precipitated .The transferrin bound iron (TIBC) in the supernatant is then determined.

CONTENTS:

TABLE-3

FE	1 X 100 ml iron solution
Iron III-CHLORIDE	0.09mmol/l

ALOX	2 X 25 g aluminium oxide
Measuring spoon for aluminium oxide is used	

PROCEDURE:

Pipette into reaction tube

Fe 1.0ml

Sample 0.5ml

mix well after 3-5 min add one level measuring spoonful of aluminium oxide ALOX (approximately 0.25-.35g).Cap and place on a rotator or roller mixer for 10min.

Remove tubes and allow standing for 3min upright or centrifuge for 1 min at 5,000rpm.

CALCULATION OF IRON CONCENTRATION:

$$C = 100 \times \frac{\Delta A \text{ sample}}{\Delta A \text{ STD}} \ \mu g/dl$$

$$C = 17.9 \times \frac{\Delta A \text{ sample}}{\Delta A \text{ STD}} \ \mu mol/l$$

CALCULATION FOR TIBC:

To calculate the TIBC multiply the result of the iron determination in the supernatant by the diluent factor 3.

TIBC = C (IRON) X 3.

REFERENCE VALUES:

TIBC: 274-385µg/dl.

3.6 DETERMINATION OF SERUM FERRITIN BY MEIA METHOD:

AIM: To determine serum ferritin by Ax SYM micro particle enzymes (MEIA) assay technology.

BIOLOGICAL PRINCIPLES OF THE PROCEDURE:

AxSYM Ferritin is based on micro particle enzyme (MEIA) technology.

Sample and all AxSYM Ferritin reagents required for one test are pipetted in the following sequence.

SAMPLE CENTRE:

Sample and all AXSYM Ferritin reagents required for one test are pipetted by the sampling probe into various wells of a reaction vessel (RV).

Sample is pipetted into one well of the RV.

Anti-Ferritin coated micro particles, Anti ferritin Alkaline phosphatase conjugate, specimen diluent and tris buffer are pipetted into another well of RV.

The RV is immediately transferred into the processing centre.

Further pipetting is done in the processing centre with the processing probe.

PROCESSING CENTRE:

A n aliquot of the specimen diluent,conjugate,micro particles &Tris buffer mixture is pipetted and mixed with the sample .The ferritin enzyme labelled antibody and micro particles bind forming an antibody –antigen-antibody complex.

Complex bound to the micro particles is transferred to the matrix cell. The matrix cell is washed to remove unbound materials.

The substrate,4-methyl umbelliferyl phosphate ,is added to the matrix cell and the fluorescent product is measured by the MEIA optical assembly.

4. RESULTS

The present study was carried out to determine the levels of blood Haemoglobin,levels of serum iron, TIBC, serum Ferritin in reproductive age group women of rural areas suffering from iron deficiency anaemia, and to assess the causes of iron deficiency anaemia.

The Haemoglobin values of the cases and controls are taken to confirm anaemia.

The investigations performed in this study include theserum ferritin levels, serum iron & total iron binding capacity&Hb levels.

The Hb levels among cases& controls are 6.544±1.5992, 11.6184±0.9064 &Hb levels are decreased in cases & remains within normal range in controls. The difference is statistically significant ($p<0.0001$).

The serum iron levels among cases & controls are 18.6326 + 6.05080 & 69.0408 + 23.5248 serum iron is decreased in cases

& remains within normal in controls. The difference is highly significant (p<0.0001).

The TIBC values among cases & controls are 447.245 +31.3166 among cases & 340.7347 + 30.4451 in controls, TIBC levels are increased in cases and remains within normal range in controls .This difference is highly significant (p<0.0001).

The serum Ferritin levels among cases & controls are 13.6747 + 38.2765 & 61.4241 + 56.4806 serum Ferritin levels are decreased in cases & remains within normal range in controls .This difference is highly significant(p<0.0001).

Nearly 46% of the women in this study are suffering from iron deficiency anaemia due to blood loss during menstruation.

Nearly 18% of the women are suffering from iron deficiency anaemia due to malnutrition caused by poor socio economic conditions.

20% of the women are suffering from iron deficiency anaemia due to blood loss during menstruation & due to malnutrition.

The age group of women who were severely affected by iron deficiency anaemia in this study were of age group 30-45 years.

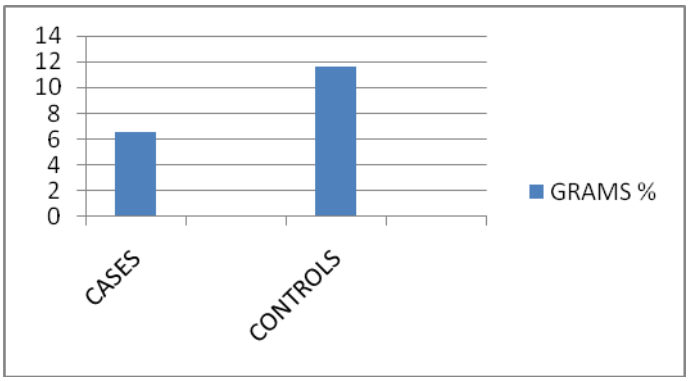
Thus the present study suggests that serum iron, serum ferritin, levels are decreased &TIBC level is elevated in iron deficiency anaemia. Blood losses during menstruation, malnutrition, due to poverty are predicted as the cause for prevalence of iron deficiency anaemia.

Thus the present study reveals that women of rural areas should be screened at the reproductive age of 30-45yrs & should be treated.

4.1 HAEMOGLOBIN:
Two sample t-test
t = -19.23 p<0.0001 df = 75
TABLE -1
HAEMOGLOBIN LEVELS (GMS%) IN CASES & CONTROLS

HB	CASES n= 49	CONTROLS n=49
MINIMUM	2.2	10
MAXIMUM	9.4	13.3
MEAN	6.544	11.6184
S.D	1.5992	0.9064
SIGNIFICANCE	/Z/ = 706>1.96, df=96, P=0.05	

HAEMOGLOBIN LEVELS (MEAN±SD) IN CASES & CONTROLS



There is significant difference in Hb values among cases & controls,with mean Hb value of 11.6184±0.9064,among controls & 6.544±1.5992 in cases.

4.2 SERUM IRON

Two sample t-test

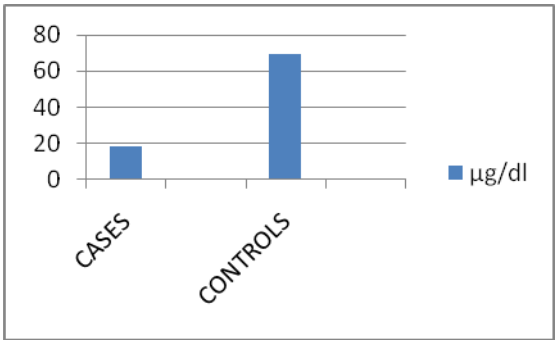
t = -14.53 p < 0.0001 df = 54

TABLE-2

Serum Iron level (µg/dl) in controls & cases

SERUM IRON	CASES n=49	CONTROLS n = 49
MINIMUM	13	38
MAXIMUM	25	138
MEAN	18.6326	69.0408
S.D	6.05080	23.5248
SIGNIFICANCE	/z/ = 6.7186>1.96,df = 96,p = 0.05	

Serum Iron Levels (Mean+ SD) in controls & cases



There is significant difference in serum iron values among cases & controls with mean serum iron value of 18.6326+ 6.05080 in cases & 69.0408+23.5248 in controls.

4.3 TIBC:

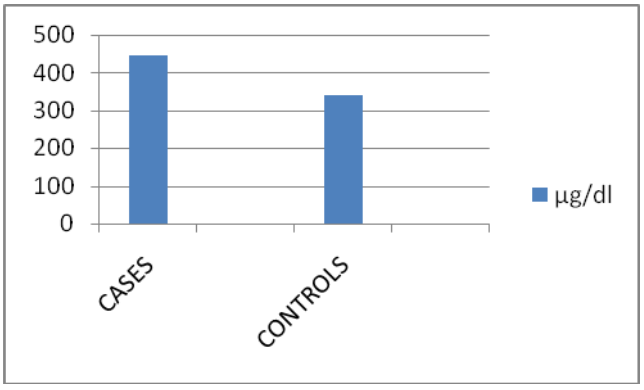
Two sample t-test

P=17.07, p <0.0001 df = 95

TABLE-3

Serum TIBC LEVELS (µg/dl) in controls & cases

TIBC	CASES n = 49	CONTROLS n = 49
MINIMUM	413	300
MAXIMUM	525	375
MEAN	447.245	340.7347
S.D	31.3166	30.4451
SIGNIFICANCE	/z/= 6.7186>1.96,df = 96, p= 0.05	



There is significant difference in TIBC values among cases & controls, with mean TIBC value of 447.245+31.3166 amongcases & 340.7347 + 30.4451 in controls.

4.4 SERUM FERRITIN:

Two sample t-test

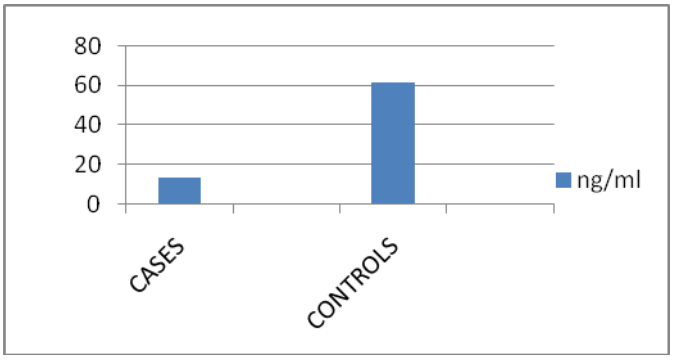
t = -4.90 p<0.0001 df =84

TABLE-4

Serum Ferritin levels (ng/ml) in cases & controls

SERUM FERRITIN	CASES n = 49	CONTROLS n = 49
MINIMUM	0.41	6
MAXIMUM	245.97	217.74
MEAN	13.6747	61.4241
S.D	38.2765	56.4806
SIGNIFICANCE	/z/ =6.7186>1.96,df= 96,p=0.05	

There is significant difference in serum ferritin values among cases & controls,with mean serum ferritin value of 13.6747+38.2765 among cases &61.4241 + 56.4806 among controls.



5.DISCUSSION

In the present study the main focus is to determine the levels of Haemoglobin, serum iron, TIBC& serum ferritin in reproductive age women who are suffering from iron deficiency anaemia.

The Haemoglobin Values are less than 10gm% then they are considered as anaemic and then iron ,ferritin & TIBC levels are estimated .

A low serum iron and ferritin with an elevated TIBC are diagnostic of iron deficiency. While a low serum ferritin is virtually diagnostic of iron deficiency, a normal serum ferritin can be seen in patients who are deficient in iron and have co existent diseases (Hepatitis, anaemia of chronic disorders).

These test findings are useful in distinguishing iron deficiency anaemia from other microcytic anaemia's.Anaemia is estimated to effect 2000 million people mostly in the developing countries. Whatever the underlying cause may be, poor socio economic conditions, lack of health education, & in adequate health facilities in rural areas of the developing countries further aggravate the severity of the problem.

Most of the earlier research on anaemia in different parts of the world was mainly focussed upon young children & women of childbearing age.

The red cell indices like Hb,the levels are significantly

decreased shown in a study conducted by Anne M Kis,MD&Molly Carnes,MD[1] .

By conducting this study effort was made to address this problem in reproductive age women of rural areas. This study reveals that anaemia is more severe in age group 30-35 years. Researchers like, Hameed. A, Simon. J et.al had almost similar observations as the findings in this study[2].

In a study done by Buchanan JG, Nixon AD, et.al[3], showed that the serum ferritin values of less than 10µg /L. The high prevalence of iron deficiency appears to be due to malnutrition.

In a study done byAnne MKis, MD &Molly Carnes,MD[4]. Showed serum Ferritin level of ≤100µg/L.

In a studyconducted byRodriquez. Blanco. A Cunningham, et.al showed,that haemoglobin concentration was low, serum iron concentration is also decreased, ferritin (<12ng/dl)and folate (<6ng/dl).Their conclusion was iron deficiency in women of reproductive age was the main cause of anaemia followed by folate deficiency. In the present study also,iron level was decreased, ferritin level was also decreased[5].

In an article by Irene Alton[6] the findings were as follows serum ferritin is decreased i.e. <15µg/l.Iniron deficiency anaemia.

In the present study TIBC levels are elevated [7,8] in cases of iron deficiency when compared with controls with significant values of with mean ± S.D TIBC value of 447.245±31.3166 among cases & 340.7347±30.4451 in controls (p<0.0001)

Serum iron is decreased[9,10,11] with insufficient dietary iron, chronic blood loss, & inadequate absorption of iron & impaired release of iron stores as in inflammation, infection & chronic diseases. The combination of low iron, high TIBC indicates iron deficiency. Without all of these findings together, iron deficiency is unproven. Low ferritin supports the diagnosis of iron deficiency, reported by Finch CA & Huber's H[12].

In the present study the prevalence of iron deficiency anaemia in reproductive age women of rural areas is high; the causes are observed by going through their case history, are malnutrition, due to poor socio economic status, and menstrual blood loss.

Present study is supported by a study done by Assami. M, S.Galan, on assessment of nutritional status of Algerian women[13] ,the study states that iron deficiency anaemia is occurring in 32% rural women ,19% semirural women ferritin levels were also low .Researchers like Vicki. L. Cleaver[14] et.al in their studies stated that the causes for iron deficiency anaemia in reproductive age women of rural areas are due to parasitic infections, poor eating habits, due to poor socioeconomic status, GIT infections and menstrual blood loss.

In a study conducted by Teresa Shamah[15]- Levy,M.Sc, the results on the prevalence & distribution of anaemia among women of childbearing age (12-49yrs)participating in the 1999 National Nutrition Survey (NNS-1999).The results were ,the

overall prevalence of anaemia was 27.8% in pregnant women & 20.8% in non – pregnant women. Higher prevalence's were observed in rural areas women and they concluded that anaemia in women of child bearing age is a growing public health problem.

In a study done by Anshu Sharma, et.al[16] .To obtain baseline data on haemoglobin (Hb) levels of adolescent girls belonging to the low-socio-economic groups. Results were 61.9% of the subjects in the urban and 85.4% in the rural area were anaemic. In adolescent girls of poor communities.In developing countries like India. These results were consistent with the present study.

In a study conducted by Rodrequez .s Blanco.ACunningham,et.al.showed ,that Haemoglobin concentration was low ,serum iron is decreased, serum ferritin decreased[5] (<12ng/dl),&folate(<6ng/dl).Their conclusion was iron deficiency anaemia in women of reproductive age was the main cause of anaemia followed by folate deficiency.

Thus the above findings for the causes of iron deficiency anaemia in these women are due to nutritional disorders and particularly women of reproductive age and constitute a major health issue in many developing countries.

The following results for the causes of iron deficiency anaemia in these women are given by observing their dietary habits, menstrual history, which were taken in the case history and are given in percentage.

Nearly 46% of the women in our study are suffering from iron deficiency anaemia due to blood loss during menstruation.

Nearly 18% of the women are suffering from iron deficiency anaemia due to malnutrition.

20% of the women are suffering from iron deficiency anaemia due to blood loss during menstruation & malnutrition.

34% of the women suffering from iron deficiency anaemia due to other infections, because of lack of poor sanitation. When compared with cases & controls in evaluating the causes for iron deficiency anaemia.

In a study conducted byJoel Monarezz[17]Homerromartinez,Ted greines et.al on iron deficiency in Tarahuamara women of reproductive age in northern mexico, they stated that iron deficiency anaemia is primarily due to lack of dietary iron,hookworm infection, blood loss during menstruation, in their findings serum ferritin levels were decreased ,their findings were consistent with present study.

In a study by T Leenstra,JD Kurtis[18],et.al, they stated that iron deficiency anaemia results as a cause of malnutrition,parasitic infection,poverty ,Results were Hb<120g/l,ferritin <12µg/l.The prevalence of iron deficiency anaemia in girls was high.

Thus our study shows that the cause of iron deficiency anaemia is not only the low haemoglobin concentration but also low serum iron, high TIBC & very low Serum ferritinis the cause to assess the iron deficiency anaemia.

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7. CASES AND CONTROLS DATA CHART

7.1 TABLE SHOWING THE PATIENTS (CASES) NAME AND THEIR CORRESPONDING DATA

CASES:

NAME	AGE	Hb(gm)	SERUM IRON	TIBC	SERUM FERRITIN
V.NAGALAKSHMI	15	5	25	413	6.3
B.SUNITHA	16	4.9	13	413	0.68
Y.MRUDULA	16	7.8	13	450	1.53
P.SOWRYAKUMARI	17	5.7	25	488	4.9
K.VARAMMA	17	6.1	13	450	40.3
CH.BHAVANI	18	5.5	13	450	1.02
SHANTHA.R	18	7	13	450	4.3
J.SIREESHA	18	6.7	25	488	2.97
LAVANYA.K	18	5.9	25	413	3.59
J.RAMADEVI.	19	8.4	13	450	93.4
L.MARY	19	4.4	13	413	43.5
P.SAMATHA	22	8.0	25	450	1.56
Y.MANGAMMA	22	3.3	25	413	2.8
D.ARUNA KUMARI	23	8.0	25	413	3.89
SK.HASEENA	23	8.9	13	488	3.53
K.USHA	24	6.4	13	450	5.98
H.KAAVYA	25	8.3	25	413	4.94
S.RAJANI JYOTHSNA	25	8.2	25	450	5.92
SHANTHA KUMARI	26	9.0	13	450	3.51
SK.AAYESHA	27	5.3	13	450	0.53
V.NANDINI	28	4.6	25	425	3.31
Y.SUSHMITHA	29	9.4	25	413	5.94
YB KOTESWARAMMA	29	8.0	25	450	2.98
J.BUJJI	30	6.4	13	450	8.28
G.RATNAKUMARI	30	8.5	25	413	5.47
M.NAGENDRAMMA	31	6.4	25	450	0.68
D.MANI	32	7.2	13	488	2.64
Y.KALYANI	32	3.3	13	413	4.53
K.RAMANI	32	6.1	25	450	3.58
D.SASIKALA	33	2.2	13	488	2.46
M.VENKATESWARI	34	8.4	13	488	0.78
K.KAMESWARAMMA	35	7.1	25	450	5.8
P.LAKSHMI	35	4.3	13	450	4.3
G.VENKATARATNAM	35	6.5	25	488	0.41
SRILAKSHMI	37	8.3	13	413	2.51
AAYESHA KUMARI.Y	38	5.2	25	488	3.5
G.LAKSHMI	38	7.8	13	413	7.78
D.VIJAYALAKSHMI	39	6.2	13	413	6.2
PITCHAMMA	40	6.3	13	488	4.58
P.JAHEDA	40	5.5	25	487	3.58
DAKSHESWARI	40	6.1	13	413	0.49
G.SURYAKANTHAM	41	5	13	413	2.75
SK.PYAARIJAAN	42	7.5	25	488	4.5
S.SREEKUMARI	42	8.2	25	413	3.53
M.PADMAVATHI	43	7.1	13	413	4.25
J.TIRUPATHAMMA	44	6.9	13	450	12.6
K.SESHAMMA	45	6	25	450	5.38
M.SAIKUMARI	45	6.4	13	488	2.03
SK.MEHBOOBI	45	7.0	25	414	76.5
M.KOTESWARAMMA	45	7.8	13	488	5.45

7.2 TABLE SHOWING THE CONTROLS NAME, AGE AND THE CORRESPONDING DATA

CONTROLS:

NAME	AGE	HB(gm/dl)	SERUM IRON(µg/dl)	TIBC(µg/dl)	SERUMFERRITIN(ng/ml)
G.KAMALA DEVI	17	10	50	338	11.4
PARIMALA JOSEPH	18	10.1	50	300	40.1
NAGA MOUNIKA	19	13.2	88	300	22
SOUJANYA. K	22	11.8	63	338	14.3
CH.KIRANMAI	23	11.3	50	375	83.4
FARZANA KAUSAR	23	11.7	63	338	24.2
P.NIRMALA	26	12.1	75	300	21.8
RADHIKA	27	12	50	338	14.3
N.RAJESWARI	30	10.9	50	375	11.7
K.ANNAPOORNA	33	12.3	138	300	20.3
P.RAMANI	34	12.5	50	338	12.6
SK.TAHIRA BEGUM	35	11.7	38	375	16.8
M.DURGAMMA	37	12	75	375	14.2
A.RAJANI.	37	13	88	300	59.4
V.PADMAVATHI	40	11.3	50	338	29.5
R.VIJAYALAKSHMI	42	10.9	50	300	6
RAJYALAKSHMI.M	44	10.1	75	338	16.5
CH.SUNDARAMMA	45	10.5	50	375	87.8
SK.MEHBOOBI	45	11.5	75	338	76.5
RESHMA.M	15	10.5	50	375	8.8
R.LAKSHMI MOUNIKA	15	10.7	88	300	12
TEJASWINI. J	17	11	50	338	60
N.MRUDULA	20	11.8	63	375	16.5
Y.SIREESHA	20	12	138	375	88
S.SUREKHA	21	13.3	50	338	25
M.MARUTI DEVI	21	12.5	75	300	30
L.SARADA	21	10.9	88	375	77
K.VANAJA	23	11.8	75	338	87
L.ANUSHA	27	12.1	75	375	12.6
Y.SUPRIYA	27	11.2	50	300	76
M.RAMADEVI	28	11	88	338	40
CH.SITALAKSHMI	30	13.1	75	375	83
B.JANAKI	30	12.2	75	300	14.3
M.KEERTI	31	13	88	375	217
R.RAJYALAKSHMI	33	10.6	38	375	59
S.RAMULAMMA	33	11.8	50	300	77
P.SUBHADRA	34	12	75	338	89
M.VIJAYANIRMALA	34	12.3	75	338	94
Y.KALYANI	36	13	88	375	138
K.RAMYA	41	13	50	338	203
SK.AASHA	41	10.1	138	300	29.5
LALITHAKUMARI	42	10.6	75	300	14.3
R.BINDU	43	11.2	75	375	76.5
T.SUMALATHA	43	12	50	338	83.4
CH.DEEPTHI	44	11.7	75	375	88
P.SREELATHA	44	10.2	50	300	24.2
V.SAILAJA	45	12	50	338	59.4
MD.NEELOFER	45	11.3	88	375	30
S.KOTESWARAMMA	38	11.5	50	375	13.6
CUT OFF RANGE	NA	16	145	385	283