

## A comparative study in variation in Iron intake of Sickle Cell Anaemia Patients of Different Socio- Economic Status

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### Abstract

This study was aimed to explore and comparative study of the iron intake strategy of sickle cell anemia Patients of different socio economic status and gender. A total of 210 sickle cell patients were taken as a subject for study, all of them belonged to the various district of Chhattisgarh. The name were selected from govt. hospitals and Red Cross society of Chhattisgarh. We have selected 210 patients (105 female and 105 male. All patients were taken from three income group 70 patients from lower income group (35 female and 35 male), 70 patients from middle income group (35 female and 35 male) and 70 patients from higher income group (35 female and 35 male). Study design was a factorial design based on 3\*2 (taken three level of socio-economic status and two level of gender). The result shows iron intake of the male of all the income groups is higher than the female. It is found that both male and female of lower income group are very anaemic as compare to middle income and higher income group. Middle income group female takes more than middle income group male but they are also anaemic. Higher income group sample is also not satisfactory because intake of iron in female is lower than the male. All income group male and female take low iron than recommended daily allowance.

**KEYWORDS**-Sickle cell anaemia, Iron intake, Socio –economic status, Gender, Anaemic.

### Introduction

Sickle cell anemia, the name of the responsible mutation and dropanocytosis is a genetic lifelong blood disorder characterized by red blood cells that assume an abnormal rigid sickle (C) shape sickling. Sickle Cell Anemia is genetic hereditary disorder where income and gender of patients play very important role.

Since the severity of sickle cell anemia is unpredictable its toll on the person's mental and emotional health is equally unpredictable, it is characterized by uncertainty with period of relative wellness interrupted by period of serious illness and crisis.

Sickle haemoglobin (HbS) is a first molecular disease known to human. It is structural variant haemoglobin in which glutamic acid, an amino acid, at position No.6 of globing chain of hemoglobin is replaced by valine. This happens due to change of nucleotide, adenine to thymine of cordon 6 of-globin gene, which located on the arm of chromosomes 11. The substitution of amino acid changes the net charge of hemoglobin, oxygen affinity and three-dimensional structure of hemoglobin thus rendering it as unstable hemoglobin. Sickle hemoglobin gets polymerized at low oxygen tension and deforms the red blood cell from discoid shape to sickle like form.

In Chhattisgarh and Madhya Pradesh Sickle cell anaemia is found in various tribal/ Scheduled Caste and backward caste. Previous studies shows that in Chhattisgarh the Scheduled Caste and Backward Class communities of the tribal predominant area also have sickle cell gene in almost same degree (Unpublished reports). According to this disease which is recessive in nature the heterozygote are asymptomatic but the homozygous suffer from serious problem tends to short life span. Generally this disease is transmitted by marriage. According to R.B.Gupta et al 1991 the computation of sickle cell load can be done by heterozygote rate and population size.

**Objective:**

- I. To explore the iron intake strategy of sickle cell anemia Patients of different socio economic status.
- II. To study gender variation regarding iron intake strategy of sickle cell anemia affected patients.

**Methodology-**

To verify the hypothesis the study was designed in single part. The entire process was a field and hospital based approach.

**Subject** -A total of 210 sickle cell patients were taken as a subject for study, all of them belonged to the various district of Chhattisgarh .The name were selected from govt. hospitals and Red Cross society of Chhattisgarh.

We have selected 210 patients (105 female and 105 male patients) age between 10-45 years. All patients were taken from three income group 70 patients from lower income group (35 female and 35male), 70 patients from middle income group (35 female and 35 male) and 70 patients from higher income group (35 female and 35 male).All were sickle cell anaemia SS patients.

**Study design-**

This was a factorial design based on 3\*2 (taken three level of socio-economic status and two level of gender).

**Tools**

To measure nutritional strategies of the subject appropriate scale were used during study

**Individual data sheet (Self developed questions)**

1. 24 hrs recall method
2. Food record

**Data analysis and result:**

For carrying out the research work firstly the sample of 210 sickle cell patients were taken into consideration. All the work stipulated here is based on research design clause one and the tools used for statistical analysis cause also based as explain in clause -3 of methodology. Hence continuing the detail statistical analyses pertain to the iron intake impact in the patients of sickle cell anemia of lower income group. The data were analyzed which is explain here briefly. As a second step the data so collected are

categorized into males and females, accordingly the said data cover tabulated in this heading 4 tables under the different and there after results were obtain and analyzed.

### Result and Analysis of Iron intake

Gender and income wise mean and standard deviation of iron intake				
s.no	Gender and income	Mean	St.Deviation	
1	Female	17.801		10.73
2	male	18.433		18.36
3	lower income grp	12.24		7.902
4	middle income grp	22.223		21.513
5	higher income grp	19.887		10.082

Reference to the table no – 1, in which sample is distinguish between the male and female. Here the wattage has been given to the iron intake keeping in the view the mean and standard deviation has been tabulated. The result shows that the iron intake of the male is slightly here than female that is iron intake of male is 18.43 and standard deviation 18.36 where as female correspond to 17.80 which is .559 lesser than the male intake.

Pertaining to nutritional aspect of iron intake the female and male. It is observed that the diet, low iron diet is taken. Due to the less iron diet patient faces of problems because sickle cell anemia is a blood disorder. In that disease HB level of patient become very low so low iron diet creates so many problems.

Further classifying the sample in with respect to their income irrespective of gender it was further seen the lower income group the mean value is 12.240 and standard deviation 7.902, middle income group mean is 22.223 and standard deviation is 21.513 and higher income group mean 9.887 and standard deviation is 10.082 which clearly shows classified with respect to their income that is lower, middle and higher. The iron intake is insufficient that is below the standard value which lease to anaemia. The most important thing when the sample is while doing the statistical analysis. Considering the gender and income there of that is lower, middle and higher. The iron intake is below the standard value as specified in the RDA.

**Table No – 2:**

### Mean of Iron intake as function at gender and income

S.No.	Gender	Income	Mean	St. Deviation
1	Female	Lower inc.grp.	10.468	4.236
2	female	middle inc.grp.	27.176	28.967
3	female	Higher inc.grp.	17.653	8.025

<b>4</b>	<b>Male</b>	<b>Lower inc.grp.</b>	<b>14.012</b>	<b>10.116</b>
<b>5</b>	<b>male</b>	<b>middle inc.grp.</b>	<b>17.27</b>	<b>9.165</b>
<b>6</b>	<b>male</b>	<b>Higher inc.grp.</b>	<b>22.121</b>	<b>11.473</b>

Now considering the iron intake with respect to their income and the comparison between the genders is considered here.

It is observed that in lower income group iron intake and standard deviation value for female and male are-

Female – 10.468 and standard deviation 4.236

Male – 14.012 and standard deviation 10.116

Where as in middle income group the mean and standard deviation of iron intake by the female and male are 27.176 and standard deviation is 28.967 and 17.270 and standard deviation is 9.165 similarly in higher income group the respective figures are 17.654 and standard deviation is 8.025 and 22.121 and 11.473 for detail please refer table no – 2, analysis shows while considering the income and distinguishing the iron intake by the male and female with respect to their income. It was found lower income group were very anemic as compare to middle and higher income group, middle income group female is taken iron. More than middle income group male, but they were also anaemic. Higher income group patients are also anaemic. Female is taken less iron than male patient. All income group male and female patients taken low as on than recommended daily allowance.

**Table NO – 3:**

<b>Test of Between subject effect: iron intake</b>							
<b>s.no</b>	<b>Source</b>	<b>sum of square</b>	<b>df</b>	<b>mean sq</b>	<b>f value</b>	<b>significant value</b>	<b>yes/no</b>
<b>1</b>	<b>Gender</b>		<b>1</b>	<b>20.938</b>	<b>0.104</b>	<b>0.747</b>	<b>no</b>
<b>2</b>	<b>Income</b>		<b>2</b>	<b>1908.59</b>	<b>9.503</b>	<b>0</b>	<b>yes</b>
<b>3</b>	<b>Gender&amp; income</b>		<b>2</b>	<b>1132.757</b>	<b>5.64</b>	<b>0.004</b>	<b>yes</b>

As the figures of the table no – which clearly specify the data pertaining to the gender income and gender income.

Gender f value 0.104

Income f value 9.503

Gender & income f value 5.64

The above result shows that the analysis carried out for gene is not significant but income and gender and income is significant which clearly show the sample with respect to the income and gender and income is relevant and the sickle cell anaemia patients faces lots of physical problem.

## Conclusion:

After carried out the statistical analysis pertaining to the iron intake impact in the sickle cell patients, it was observed that the dietary habit has given the impact in the entire group and the income, pertaining to the iron intake analysis.

The iron intake is considered the relevant figures obtain is mentioned under –Iron intake of male is slightly higher than female, that is in male 18.43 where as the female correspond to 17.801 which is .559 gm. lesser than the male intake.

It is seen that the sample in with respect to their income irrespective gender, the lower income iron intake is 12.240, middle income group 22.223 and in higher income group 19.887 which clearly shows that iron intake is below the standard value as specified in the R.D.A.

Considering the iron intake with respect to their income and comparison between the genders.

It is observed that the mean of iron intake in lower income group is female - 10.468 and male 14.012, whereas in middle income group the mean is 27.176 and 17.270, similarly in the higher income group the respective figures are 17.65 and 22.121.

The result shows iron intake of the male of all the income groups is higher than the female. It is found that both male and female of lower income group are very anaemic as compare to middle income and higher income group. Middle income group female takes more than middle income group male but they are also anaemic. Higher income group sample is also not satisfactory because intake of iron in female is lower than the male. All income group male and female take low iron than recommended daily allowance.

As tabulated in the table no. – 3 which specify the data pertaining to the gender, income and gender & income. F test is held, result shows that gender is not significant but income and gender & income is significant. Which clearly show the sample with respect to the income and gender & income is relevant and the sickle cell anaemia patients face lots of physical problem with less intake of iron.

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