

Original Research Article

## A Percentage Distribution Study of Iron Deficiency Anemia in Females of Tribal Area of Kutch, Bhuj of Gujarat

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### ABSTRACT

**Introduction** - Nobody is immune to have an anemia that is caused by innumerable factors. Iron deficiency anemia is one of the global problems, mainly affecting pregnant and lactating females, growing children and elderly people with some underlying disease causing blood loss. It is more prevalent in lower socioeconomic class, in rural and tribal areas.

**Methods** – This was a prospective observational study of primary data, in which 1200 females of 20 – 49 years of age, of lower socio economic class, in tribal area were screened for iron deficiency anemia depending on their Hb concentration, MCV, MCHC and RDW.

**Observation and results** – 454 out of 1200 female patients were diagnosed to have iron deficiency anemia.

**Conclusion** - Around 38% of females of and around reproductive age, of lower socioeconomic tribal area of Kutch, Bhuj, Gujarat, suffer from iron deficiency anemia.

**Keywords** – Iron deficiency anemia, tribal, socioeconomic, Prevalence.

### INTRODUCTION

Anemia is defined as the reduction in the oxygen carrying capacity of blood, due to either decrease in total RBC count or decrease in hemoglobin concentration or both, as per the age and sex of an individual.

[1] Any anemia that responds to adequate dosage of iron is called Iron deficiency anemia and it is the commonest anemia found in India. [2] As per National Family Health survey, more than half of women in India (55%) have anemia, including 39% with mild anemia, 15% with moderate anemia and 2% with severe anemia. [3] According to WHO in the developing countries, about 50-60 % of young children and pregnant females and 20-30 % non-pregnant females were affected by iron

deficiency anemia. [4] Thus Iron deficiency anemia is one of the global problems, mainly affecting the developing countries. Pregnant and lactating females, growing children and elderly people with some underlying disease causing blood loss are at more risk as compared to other groups of population. [5] However, nobody is immune to have an anemia and iron deficiency anemia is caused by innumerable factors, like decreased intake as in milk fed infants; increased loss like in acute as well as chronic hemorrhage as in worm infestation, peptic ulcer, piles and increased menstrual blood loss; during increased demand as in infancy, childhood, pregnancy, lactation; defective utilization due decreased absorption of iron in diseases of the stomach

and duodenum worldwide, [1,6] and affects women more often than men. Iron-deficiency anemia affected 1.2 billion people in 2013. [7] In 2013 anemia due to iron deficiency resulted in about 1, 83,000 deaths - down from 2, 13,000 deaths in 1990. [8] So the present study was planned and carried out with the aim, to study the incidence and prevalence of iron deficiency anemia in females of and around reproductive age group, residing in a rural tribal area of Kutch region, to be aware of the severity and magnitude of the problem.

## MATERIAL AND METHODS

The present study of evaluation of percentage distribution of iron deficiency anemia in females of and around reproductive age groups was conducted in the Department of Physiology, Gujarat Adani Institute of Medical Sciences, Bhuj, Gujarat. The anthropometric measurements were carried out in all the subjects. History taking and medical examination was carried out. The nature of the test was explained to the subjects.

**Inclusion criteria** – Total 1200 volunteer female subjects / patients, of and around the reproductive age group, i.e. 20 to 49 years of age, not having any major illness or chronic addiction, were selected for the study from among those visiting the OPD of G K General Hospital, Bhuj, Gujarat.

Detailed history was taken from each patient, including history of present illness, past illness, anemia among other members of the family, socio-economic history, history of blood loss, ingestion of drugs, menstrual, gynecological and obstetrical history in females, history of diarrhoea, dysphagia, malaria, eating habits, quality and quantity of food consumed, history of blood transfusion or donation and worm infestation.

**Exclusion criteria** - Subjects less than 20 and more than 49 years of age, suffering from any major illness and with chronic addiction were excluded from the study. Data comprising of clinical history regarding name, age, sex, occupation were

obtained and recorded from all the subjects. Special emphasis was given in history for finding out any symptoms suggestive of anemia.

A thorough physical examination was carried out on each subject with special emphasis given to signs suggestive of anemia like pallor, koilonychia, lymphadenopathy, hepatomegaly, splenomegaly, purpura, bruises, jaundice and symptoms like weakness, fatigue, poor concentration and dyspnea.

Following history and examination, preliminary blood tests were performed on 3ml venous blood, including complete blood counts (CBC) by automated method.

A clinical diagnosis of presence of iron deficiency anemia was made on the basis of history, examination and blood tests carried out on each subject. The special emphasis was given to the clinical parameters in the subjects like Hb concentration and red cell indices i.e. MCV, MCHC & RDW.

The presence and grading of anemia was confirmed on each subject on the basis of hemoglobin concentration as – mild (12-8 gm/dl), moderate (8-5 gm/dl) and severe (< 5 gm/dl)(2). Morphologically the anemia was confirmed on each subject on the basis of values of MCV and MCHC as – macrocytic (MCV > 94  $\mu$ m), microcytic (MCV < 78  $\mu$ m), hypochromic (MCHC < 32%). [9]

In order to confirm and differentiate between microcytic hypochromic, iron deficiency anemia and thalassemia, red cell distribution width (RDW) index was considered as - iron deficiency anemia with elevated RDW of > 14.6% and thalassemia with normal RDW, i.e. between 11.6 to 14.6%. [10]

## OBSERVATIONS AND RESULT

Around 1200 female subjects/patients were evaluated during the period of August 2015 to January 2016, over a period of about 6 months, during their visits to outpatient department of GK General Hospital, Bhuj, Gujarat.

In present study, around 454 (37.83%) out of 1200 subjects evaluated, were found to be suffering from iron deficiency anemia. It was observed in the study that –

90 subjects out of 224 evaluated had iron deficiency anemia, in August 2016

62 subjects out of 207 evaluated had iron deficiency anemia, in September 2016

85 subjects out of 197 evaluated had iron deficiency anemia, in October 2016

79 subjects out of 225 evaluated had iron deficiency anemia, in November 2016

75 subjects out of 167 evaluated had iron deficiency anemia, in December 2016

63 subjects out of 180 evaluated had iron deficiency anemia, in January 2017

**Table-1: Distribution of Iron Deficiency Anemia cases during August 2015 to January 2016**

| Serial Number | Month and Year | Total sample tested | Diagnosed with IDA |
|---------------|----------------|---------------------|--------------------|
| 1.            | August 2015    | 224                 | 90                 |
| 2.            | September 2015 | 207                 | 62                 |
| 3.            | October 2015   | 197                 | 85                 |
| 4.            | November 2015  | 225                 | 79                 |
| 5.            | December 2015  | 167                 | 75                 |
| 6.            | January 2016   | 180                 | 63                 |
|               | Total          | 1200                | 454 (37.83%)       |

## DISCUSSION

Work done over the past few years gives us an indication of higher percentage distribution of iron deficiency anemia in both males and females, with much higher prevalence in females of reproductive age group, especially in tribal population of lower socioeconomic class. The data on this aspect was lacking in this part of the country, so the present study was conducted to evaluate the percentage distribution of iron deficiency anemia in females of and around the reproductive age group, i.e. 20 to 49 years, residing in the tribal area of the Kutch, Bhuj, Gujrat.

After the detailed history and examination, blood tests were performed on each subject with prior consent, that was including the complete blood count (CBC) and a special emphasis was given to parameters like Hb concentration, MCV, MCHC and RDW to label the patient to be suffering from iron deficiency anemia.

The presence of anemia was confirmed on the basis of hemoglobin concentration as mild (12-8 gm/dl), moderate (8-5 gm/dl) and severe (< 5 gm/dl). (2). Morphologically the anemia was confirmed on the basis of values of MCV and MCHC as macrocytic (MCV > 94  $\mu$ m), microcytic (MCV < 78  $\mu$ m), hypochromic (MCHC < 32%). [9]

To confirm iron deficiency anemia, RDW index was considered as RDW of

>14.6 %, (normal 11.6 - 14.6 %). [10-12] The findings of the present study are consistent with the previous study by Parikh and Shah where prevalence of Iron deficiency anemia was evaluated in males and females with 47% positive cases. [13] It is also consistent with the findings of Mauro and Ugo. [14]

The criteria for determining the presence of anemia, as recommended by the World Health Organization (WHO), are based on hemoglobin cut-off values for age and sex with an additional epidemiological criterion for assessing the severity and magnitude of the problem in populations. [15,16]

Ideally, prevalence studies should be based on a representative sample composed of every segment of population but when this is not feasible, the prevalence in high-risk group could be a valid indication for the magnitude of the problem. [17] G K General Hospital is the only largest hospitals in Kutch, Bhuj region where patients come from rural tribal as well as urban side, so we decided to evaluate as female patients as possible attending OPD patients over a period of six months, to find the percentage distribution of iron deficiency anemia. We found that about 37.83% of the females suffering from iron deficiency anemia. The high prevalence in India; is due to poor socio-economic condition, lack of proper health education and inadequate health facilities in the rural and tribal areas of the

developing countries, further aggravating the severity of the problem. Most of the earlier research on anemia in different parts of the world including India was mainly focused upon females. By conducting this study, efforts were made to address the severity and magnitude of this problem in females of the tribal population of our society.

## CONCLUSION

To conclude, the incidence and prevalence of iron deficiency anemia is around 38% in females of 20 to 49 years of age, of lower socioeconomic status of the tribal area of Kutch, Bhuj. It is commonly associated with blood loss during menstruation and increased requirement of iron during pregnancy and lactation. It is suggested that no anemic patient should be treated blindly with hematinic etc., they must be investigated to find out the cause and type of anemia before starting treatment.

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