AMERICAN JOURNAL OF PHARMTECH RESEARCH

A Study of Anemia Prevalence among Adolescent Female Students of Azam Campus, Pune

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ABSTRACT

Anaemia is major public health problem in female about 25-50% girls become anaemic by the time they reach the age of menarche. During adolescence period need for iron is increased and also there is further increase due to regular menstrual loss. In developing countries, the high iron demands are not met, mainly because of the poor diet of low iron bioavailability & frequent parasitic infection, thus leading to higher incidence of anaemia in women & girls. Thus, an adolescent who conceives soon after menarche is likely to start pregnancy with depleted iron store[1]. Keeping all these in mind this study was conducted to investigate the haemoglobin level of the female adolescent students studying Azam Campus, Pune, Maharashtra. To investigate the status of anaemia among adolescent female students of Azam Campus, Pune, Maharashtra. Cross sectional prevalence study of sample size 500 was conducted among students from the primary secondary, higher secondary and junior college and U.G classes of Azam Campus, Pune. The study was designed on two parameters the first one was questionnaire-based scale (subjective parameter) and second was evaluation of haemoglobin percentage through Sahli's method as an objective scale.[2] Prevalence of anemia was found to be 91.8%.

Keywords: *Anaemia; Adolescent; Haemoglobin; Su-ul-qinya; Unani Medicine.*

INTRODUCTION

Adolescence has been defined by the World Health Organization as the period of life spanning the ages between 10-19 years[3]. Anaemia is defined as a deficiency in the numbers of red blood cells or in their haemoglobin contain, resulting in pallor, shortness of breath and lack of energy[4].

Anaemia also defined as defined as reduction in total circulating red blood cells leads to decrease in total oxygen carrying capacity of blood. Since the oxygen carrying capacity of RBC's cannot be measured, therefore anaemia has been defined as a decrease in haemoglobin concentration in the blood below the normal lower range with respect to age and sex. Lower level of haemoglobin (Hb%) concentration 13.0gm/dl for male and 11.5gm/dl for female. while new born infants have higher haemoglobin level and therefore lower level in infants is 15gm/dl whereas at 3 months these level goes down to 9.5gm/dl because of destruction of RBC's at early age of life. Even though Hb% plays an important role in majoring anaemia red cell count, haematocrit (PCV) and absolute values (MCV, MCH and MCHC) also provide alternate means of assessing anaemia[5].

Anaemia is global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children in 2002, iron deficiency anaemia (IDA) was considered to be among the most important contributing factors to the global burden of disease [6]. Nutrition anaemia due to iron deficiency is a global problem and it affects more than a billion people in the entire world. In the developing world alone, 370 million women suffer from anaemia[7].

Epidemiology

Anaemia is major public health problem in female about 25-50% girls become anaemic by the time they reach the age of menarche. During adolescence period need for iron is increased and also there is further increase due to regular menstrual loss. In developing countries, the high iron demands are not met, mainly because of the poor diet of low iron bioavailability & frequent parasitic infection, thus leading to higher incidence of anaemia in women & girls. Thus, an adolescent who conceives soon after menarche is likely to start pregnancy with depleted iron store[1].

Research Studies

To know the iron status of adolescent's girls (Khan *et al*. 1996) selected 225 girls (12-15 years) of Bangladesh. It was reported that 22% of the girls (46) of the subject were found to be anaemic having haemoglobin level less than 12 g/dl. A study conducted by Adgeppa *et al*. (1997) in Indonesia including 805 adolescent girls showed that 21.1% of the girls (170) were anaemic having

haemoglobin level less than 12 g/dl. In Sri Lanka, a study was conducted on 690 adolescent girls to estimate prevalence of anaemia (Jayyatissa and Piyasena, 1999). Results indicated that 21.1% (146) of girls were having haemoglobin level less than 11.5 g/dl. And thus, were anaemic[2].

Shahabuddin *et al*. (2000) conducted a study on nutritional status of adolescents in a rural community of Bangladesh. It was reported that 98% (1483 out of 1453) of adolescent girls suffered from anaemia. Jondhale *et al*. (1999) selected 300 school going adolescent girls (13-15years) from Parbhani city to know the Prevalence of anaemia. Haemoglobin level indicated that 12-15 years old girls had moderate anaemia with haemoglobin level of 9.92g/dl whereas 14year old girls were anaemia with haemoglobin level of 10.47g/dl [8].

METHOD

The present study is a cross sectional, field survey entitled as "Prevalence of Su-ul-Qinya (anaemia) among the adolescent females. The place of study was selected. The survey was carried out among students from the primary secondary, higher secondary and junior college and U.G classes.

The total sample size for the survey was 500.The study got an ethical clearance from ethical committee. The study was designed on two parameters the first one was questionnaire-based scale (subjective parameter) and second was evaluation of haemoglobin percentage through Sahli's method as an objective scale [2]. The interviewees were asked to participate in the study voluntarily after explaining them the plan and purpose of the study. All the subjects were assured for obtaining an informed consent. Then the subjects were evaluated on questionnaire-based scale. Then their blood was collected in the college hospital to evaluate their Hb% level. All the acquired data were put into a master chart and depicted in the table and figure form for better understanding of the results. The confidentiality of the record was maintained.

Place of study:

The place of study selected is a campus which accommodates schools and different colleges. The survey was conducted on students from the primary, secondary, high secondary and junior and senior colleges situated in the study area.

Duration of study:

The present study was completed in 6 months.

Inclusive criteria:

Healthy population among adolescent female.

Exclusive criteria:

- Congenital form of anaemia or any chronic disease.
- Other forms of anaemia.

Materials required for the Study:

1. Annexure I, II, III- Local language was being use during the interview to make it convenient and easily understood.
2. Weighing machine-platform type.
3. Measuring tape.
4. Sphygmomanometer.
5. Stethoscope.
6. Haemoglobin meter.
7. N/10 hydrochloric acid.
8. Distilled water.
9. Spirit.
10. Lancets.
11. Charts regarding good dietary habits, modification of life style etc

Assessment criteria:

Anaemia was diagnosed according to WHO criteria according to which   haemoglobin is below 11gm/dl in females.

Anaemia is graded as follows:

1. Mild anaemia: 10.0-11.9gm%.

2. Moderate anaemia: 7.0-9.9gm%.

3. Severe anaemia: < 7.0gm%.

Method of collection of Data:

The survey was conducted among the students who have reached the age of adolescent when calculated based on the academic status primary, secondary, high secondary and junior college. Approval of college Ethical Committee and approved by MUHS was obtained before starting the study. The necessary requirements of principals' permissions from the schools and colleges were obtained since the study and the questionnaire were based on the evaluation of the students. The students were first asked to participate in the study voluntarily, further they were assured for the confidentiality of the records. Then the written consents were obtained from the participants. All the technical and medical terminologies were explained to the participants and they were asked to fill the evaluation proforma. Data was collected by well-designed proforma which based on book of haematology by Safdar SM.[9,10]

Data Analysis:

Data thus collected was analysed using suitable statistical package for Social Sciences (SPSS) with the help of Microsoft Excel Windows Version 11.5. The statistical analysis of the data collected was done by using Chi-square (x^2) as per the guidelines of Bio-Statistics at the significance level of 95% (p<0.05).

Aims and Objectives

1. To estimate the prevalence of anaemia among adolescent females.
2. To study pattern symptoms according to Unani parameter.
3. The study the socio demographic factors associated with anaemia.

RESULTS AND OBSERVATIONS

Table 1: Prevalence of Anaemia in the study sample of adolescent females.

Status	No. of females	Percentage
Anaemic	459	91.8
Normal	41	8.2
Total	500	100.0

Comments:

1. The prevalence of Anaemia was 91.8% in the study sample.
2. Normal students were only 41 out of 500 i.e. 8.2%. Thus, the number of normal students was very low in the study.
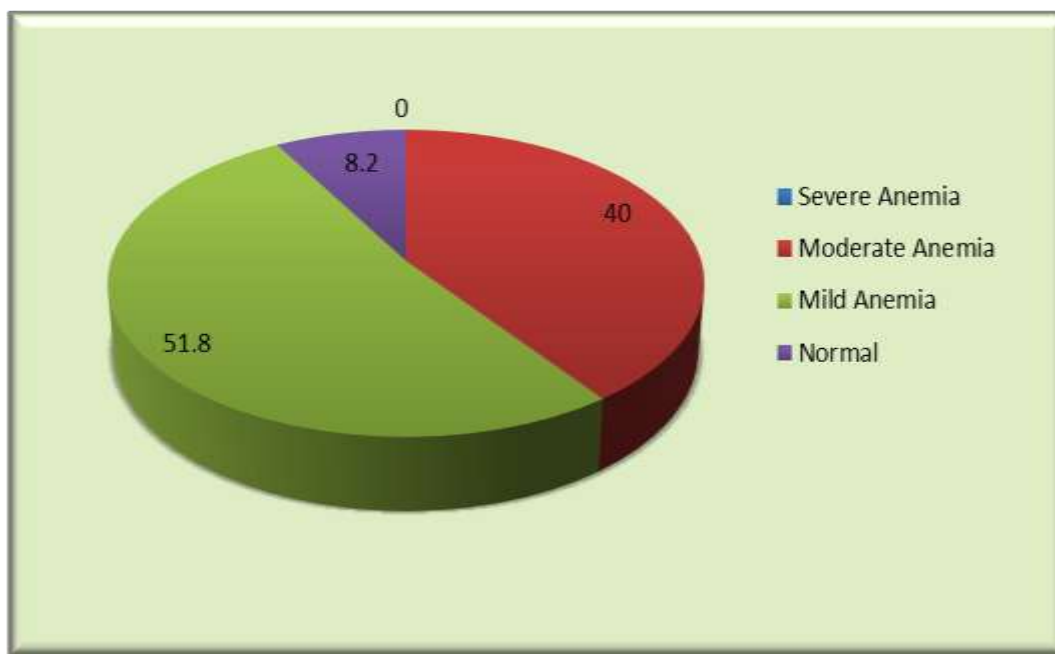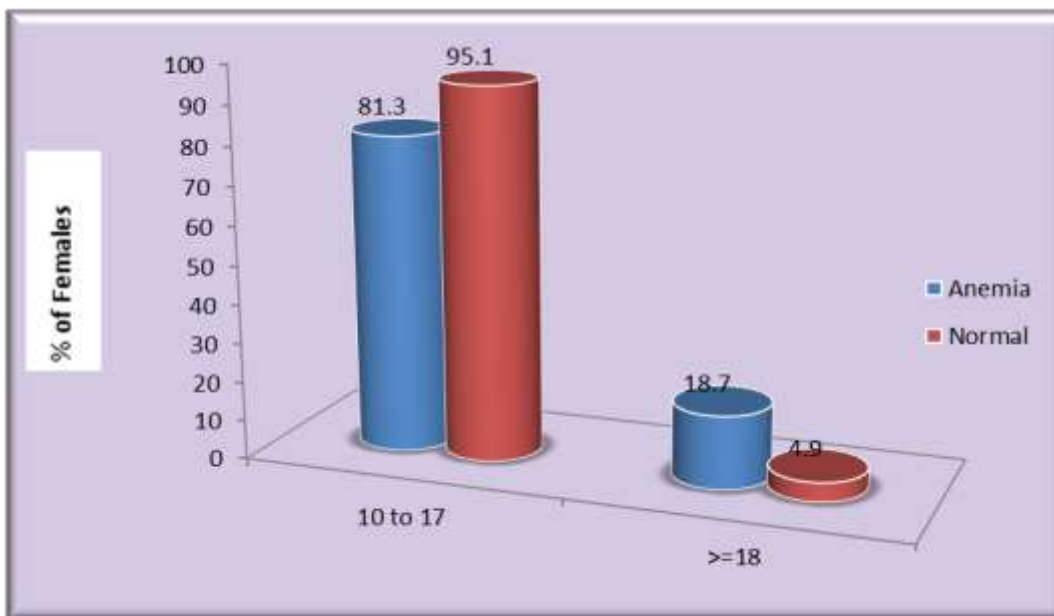

Figure 1: The prevalence of type of Anaemia in the study sample.

Comments:

1. The prevalence of mild anaemia was highest (51.8%) in the study sample.
2. The prevalence of moderate anaemia was (40.0%) in the study sample.
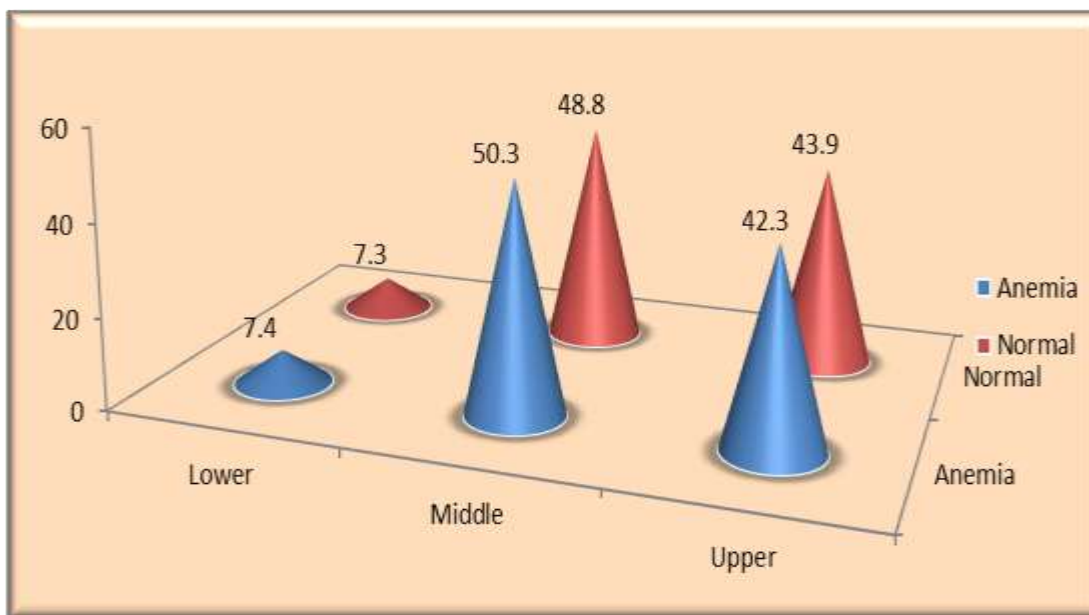
3. There was no case of severe anaemia.

Figure 2: Prevalence of Anaemia according to age group.

Chi-square test = 0.421, d.f = 2, p = 0.979 (not significant)

P value <0.05 is considered to be statistically significant.

Comment:

The difference in distribution of anaemia between the two age groups in normal students and cases is statistically significant.
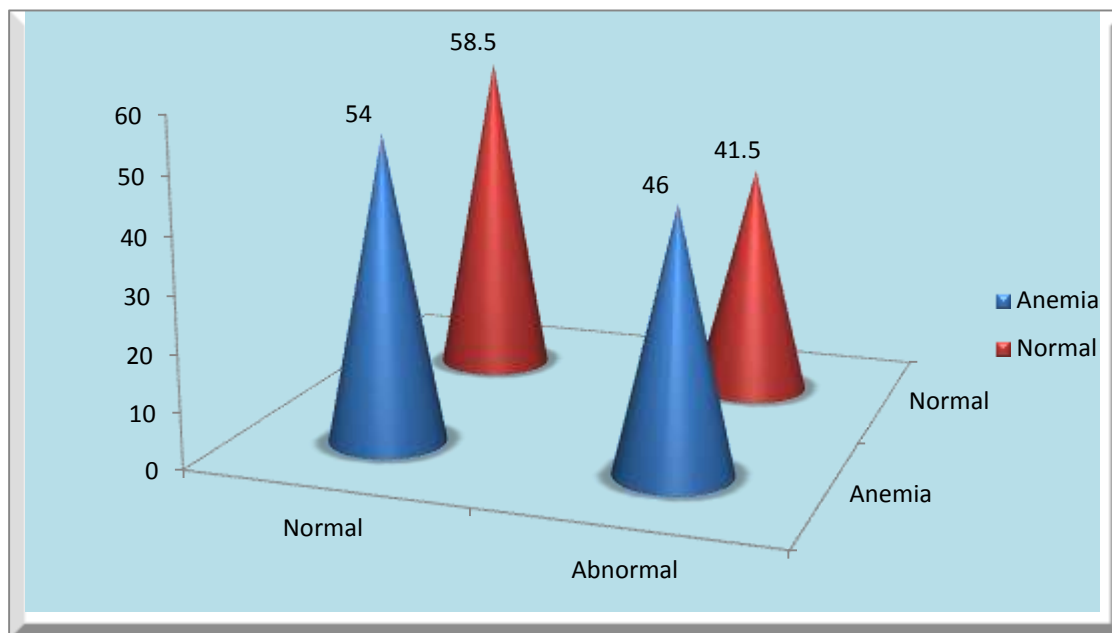

Figure 3: Prevalence of Anaemia according to socio-economic Status.

Chi-square test = 0.421, d.f = 2, p = 0.979 (not significant)

P value <0.05 is considered to be statistically significant.

Comment:

The prevalence of anaemia is not significantly different across different groups of socio-economic status.
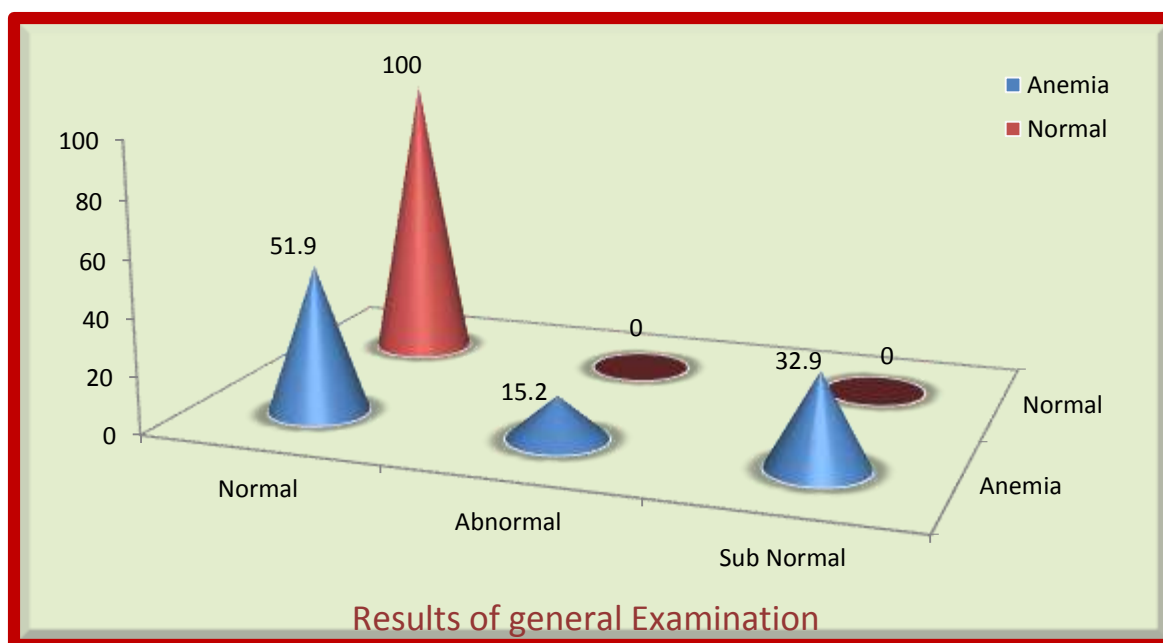

Figure 4: Prevalence of Anaemia according to the Menstrual History.

Chi-square test = 0.308, d.f = 1, p = 0.579(not significant): P-value <0.05 is considered to be statistically significant.

Comment:

The menstrual history did not differ significantly among anaemic and normal students.

Figure 5: Prevalence of Anaemia according to the results of general exsamination.

Chi-square test = 35.4, d.f = 2, p = 0.001(significant)

P-value <0.05 is considered to be statistically significant.

Comment:

The general examination is significantly abnormal among the anaemic cases.

Observations

The prevalence of anaemia was 91.8% and normal students were 8.2%. The two groups did not differ significantly with respect to personal history, menstrual history, type of diet, symptoms according to Unani parameters and awareness about the various facts concerning anaemia. Chi square test done in each category (P > 0.05%).

DISCUSSION

The most dramatic health effects of anaemia, i.e., increased risk of maternal and child mortality is due to severe anaemia, have been well documented[11,12]. In addition, the negative consequences of IDA on cognitive and physical development of children and on physical performance particularly work productivity in adults are of major concern[13]. In the last three decades, there have been various attempts to produce estimates of the prevalence of anaemia at different levels including at the global level, but until the present time, there has never been a systematic review of all of the data collected and published with the objective of deriving regional and global estimates.

As far as India is concern the study of Anaemia prevalence has been done at various levels and among different population, which suggest that prevalence of anaemia in India is among the highest in the World. The most vulnerable population group is pregnant women and pre-school children. Even among higher income educated segments of population about 50% of children, adolescent girls and pregnant women are Anaemic. Inadequate dietary iron, foliate intake due to low vegetable consumption, perhaps low vitamin B-12 intake and poor bioavailability of dietary iron from the fibre, and rich Indian diets are the major factors responsible for high prevalence of Anaemia. Increased requirement of iron during growth and pregnancy and chronic blood loss contribute to higher prevalence in specific groups. In India, Anaemia is directly or indirectly responsible for 40 %of maternal deaths[14].

Considering the above facts, the said study has been decided to study the prevalence of Anaemia among the adolescent girls, as evident in various studies that adolescence is a vulnerable age group for Anaemia in the Indian population[120]. The entire mandatory and ethical requirement was fulfilled as per the protocol. The study was based on survey among the adolescent girls. The questionnaire

was filled during the survey and depicted in to tables and self-explanatory graphs for the result. The findings were as following.

Table number 01 are suggesting that overall prevalence of anaemia among the study sample were observed 459(91.8%) as Anaemic and 41(8.2%) as Normal. These findings coincide with the findings with various earlier studies which reveals that there are almost no countries where Anaemia is not at least a mild public health problem in all population groups, whereas India and other developing SEAR countries having prevalence rate more than 50%[14,15].

Figure number 01 are suggesting the prevalence of type of anaemia in the study sample. The moderate anaemic class were 200 (40.0%) in the study sample whereas mild anaemic was 259(51.8%) in the study sample. The severe anaemia was not been observed among the study population. These finding suggest that most maximum numbers of anaemia subjects were having mild type followed by moderate type. This observation is in accordance to the study of Kavr S *et al* which reveals that the prevalence of mild type of anaemia was more in comparison to moderate type.

Figure number 02 are suggesting the prevalence of anaemia according to the age group. In the age group of 10 -13 years the observed anaemic subjects were 373 (81%) and normal subjects were 39(95.1%) followed by 86 (18.7%) as anaemic and 24(4.9%) as normal in the age group of >18 years. These finding suggest that the difference in distribution of anaemia between the two-age group in normal students and cases is statistically significant.

Figure number 03 is suggesting prevalence of anaemia according to socio-economic status. In the low socioeconomic group, the anaemic subjects were 34 (7.4%) and 03 (7.3%) were normal whereas in middle socioeconomic group the anaemic observation were 231 (50.3%) and 20 (48.8%) were normal followed by upper socioeconomic group anaemic observation were 194 (42.3%) and 18 (43.9%) were normal. These findings reveal that the prevalence of anaemia is not significantly different across different groups of socio-economic status. As stated in many studies that the poverty, socio-custom and socio-cultural factors are not only the cause behind the anaemia but there are lot of influencing and predisposing factors which contribute anaemia, including dietary habits, menstrual irregularities, and mal absorption syndrome.

Figure 4 are suggesting prevalence of anaemia according to menstrual history. Out of total 459 anaemia subjects the menstrual history of 248 (54%) were normal and 24 (46%) were abnormal. Similarly, out of total 41 normal subjects the M. History of 24 (58.5%) were normal and 17 (41.5%) were abnormal. These findings suggest that the menstrual history did not differ significantly among anaemic and class.

In our study we have observed Menstrual History of either category including from polymenorrhoea, menorrhagia to oligomenorrhoea, hypo menorrhoea and dysmenorrhoea. The possible justification for insignificance is that many anaemia subjects were giving history of polymenorrhoea, where many as normal subjects were giving history of oligo, hypo and dysmenorrhoea, thus either subjects were documented as per there given history of menstrual status.

Figure number 5 are suggesting prevalence of anaemia according to the results of general examination. The general examinations by in comparison to the 238(51.9%) as normal whereas the general examination of all the 41(100%) subjects were found to be normal. This finding state that the general examination is significantly abnormal among the anaemic cases.

CONCLUSIONS AND SUMMARY

In developing countries like India, other than pregnant women the preschool age children, school age children and adolescence girls are the most vulnerable group for anaemia. The study reveals that poor bioavailability of dietary iron coupled with low intake of haemiron is a major etiological factor for anaemia. A number of strategies are available for dietary modification based either on promoting the intake of iron absorption inhibitors to double the bioavailability of iron. Worm infestation may also influence this condition.

The present study is designed with the aim to evaluate the prevalence of anaemia among adolescent female, as suggested in many studies that adolescence is a vulnerable age group for anaemia in the Indian scenario. The study was based on a preformed questionnaire evaluation as subjective and haemoglobin assessment through Sahli's method as objective parameters. The inclusion of Unani parameters and awareness status in the questionnaire were the salient features of the study. The study was survey based among defined population of the study area.

All the mandatory of criteria of ethical clearance, consent and permission of the school, college principals for survey were done as per the requirement of the study. The subjects selected for the study were as per the inclusion criteria. They were informed about the nature of study and assured about the confidentially of the record. After collecting all the data, the result was analysed as per the suitable statistical test for significance.

As mentioned in the result that total prevalence of anaemia was 91.8% in the studied population. The education status, socio economic status, personal history and menstrual history were not observed significantly related with anaemia, but age has been observed significantly related with anaemia.

The highest prevalence of mild anaemia has been observed followed by moderate type, whereas the subjects having history of mixed diet were observed more anaemic in comparisons to vegetarian peoples. The presenting symptoms of anaemic subject were mainly fatigue, followed by weakness, polymenorrhoea and palpitation. These symptoms are in accordance to the classical literature of Unani medicine. Regarding the awareness findings in the study is a matter of concern. The maximum subjects were unaware about the detections and consequences of the anaemia. Referring to all the above facts of the study following conclusion could be inferred. Anaemia is still a great problem among the adolescence. Higher prevalence of anaemia in female when they had attained menarche. High menstrual blood loss is associated with increased risk of anaemia.

Anaemia is one of the major public health problems that affect populations globally in both rich and poor countries. Although the primary cause is iron deficiency, it may be present as an isolated case. But frequently it coexists with a number of other causes, such as malaria, parasitic infestation, nutritional deficiencies, and haemoglobinopathies. Anaemia may affect not only the neonate and infant but also increase the risk of non-communicable diseases when the child grows into an adult and the risk of low birth weight in the next generation. In developing countries like India, other than pregnant women the preschool age children, school age children and adolescence girls are the most vulnerable group for anaemia. The study reveals that poor bioavailability of dietary iron coupled with low intake- of haemiron is a major etiological factor for anaemia. A number of strategies are available for dietary modification based either on promoting the intake of iron absorption inhibitors to double the bioavailability of iron. Worm infestation may also influence this condition.

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RECOMMENDATIONS

Following recommendations can be suggest in this study

1. The study provides an indication to initiate the anaemia prophylaxis measures for adolescent females including nutrition and awareness education programme in schools.
2. Technology for detection of anaemia and its effective treatment at affordable cost at every PHC should be made available by the authorities.
3. Effective implementation of the 10th plan strategies for combating anaemia can go a long way in reducing the short and long-term adverse consequences of anaemia.

ACKNOWLEDGEMENT

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