ORIGINAL RESEARCH PAPER

Health Service

PREVALENCE OF ANAEMIA IN RURAL ASHRAM SHALA SCHOOL GIRLS (i.e. SCHOOL with HOSTEL) IN RURAL AREA IN RAIGAD DISTRICT,INDIA

KEY WORDS: Adolescent girls, Anemia, Ashram Shala/School(i.e. School with dormitory /hostel).

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ABSTRACT

Background: Anemia has always been one of the major health problem worldwide. Because of socioeconomic problems, the prevalence of anemia has always been higher in developing countriesespeciallyamong adolescent females.Globally, anaemia affects 1.62 billion people, which corresponds to 24.8% of thepopulation. Findings from NFHS-3 (2005-06) indicate that 56% of the adolescent girls in India are anaemic and,of these 17% suffer from moderate to severe anaemia.

Objectives: To assess the prevalence and the severity of the anaemia among the adolescent girlsstudying and Residingin Ashram Shala/School(i.e. School with dormitory /hostel).

Material andMethod: Area or region addressed – Anemia in adolescent girls. Present study was conducted among 211 adolescent (10-19Yrs) girls studying and residingin Ashram Shala/School of Raigad District, Maharashtra, Indiafrom June2015-July2016. Blood was collectedby finger prick and the hemoglobin was determined by cyanmethemoglobin method.

Results: The prevalence of anaemiawas 99.52% (with that of Moderate anaemia being 99.06%, that of mild anaemia being 0.47%. Majority of the girls had the moderate anemia. The prevalence of anaemia was considerably high among the adolescent girls studying and residing in Ashram Shala.

Conclusion: A high prevalence of anaemia was found among the adolescent girls staying in AshramShala (School with dormitory /hostel).Study results suggest that all the schoolgirls should be screened periodically and appropriate measures should be takenaccordinglysuch asDeworming, providing Iron Supplements and Nutritious Diet.

INTRODUCTION

Background: Anaemia a manifestation of under-nutrition and poor dietary intake of iron is a serious public health problemall over the world and has predominance in developing countries like IndianSubcontinent, particularly in children and especially among the adolescent girls. India has the world's highest prevalence of iron deficiency anaemia among the women, with 60 to 70 % of the adolescent girls being anaemic. In India, a home to nearly 113 million adolescent girls {1}, as many as 56 percent are suffering from anaemia and of these 17 percent suffer from moderate to severe anaemia {2}.

In Rural India were schools are very few and far from home, the Tribal peoples living in such rural Remote villages are poor farmers / daily wage workers/ workers of lower socio-economic status, This people send their Children's to Ashram Shala (i.e. School with dormitory /hostel).) , Were They Study, Play and Eat, as well as Reside/Stay in the School with a Hostel/ Dormitory. These Types of school also Known as Ashram Shala/Schools are common in Remote Rural Areas of Maharashtra state in India. There are over 1,100 tribal residential schools in Maharashtra, 528 Government Ashram Schools and 556 Aided Ashram Schools. More than 5 lakh tribal students are enrolled in these schools.Maharashtra is the only state that allocates budget for tribal development in proportion of its tribal population.

Anemia is one of the most important health problems throughout the world {3}. Anaemia is a condition in which the number of red blood cells (and consequently their oxygen-carrying capacity) is insufficient to meet the body's physiologic needs.

Anaemia is defined as the condition in which there is either less than the normal number of red blood cells (<4.2 millions/µl) or less than the normal quantity of (<12 g/ml) haemoglobin in the blood.

Iron deficiency is thought to be the most common cause of anaemia globally, but other nutritional deficiencies (including folate, vitamin B12 and vitamin A), acute and chronic inflammation, parasitic infections, Menstruation in Adolescent Females and inherited or acquired disorders that affect haemoglobin synthesis, red blood cell production or red blood cell survival, can all cause anaemia.

The word adolescence is derived from the latin word, adolescere; which means "to grow, to mature"{4}. Adolescence is considered as a nutritionally critical period of the life. Adolescents are at high risk of iron deficiency and anaemia due to accelerated increase in requirements for iron, poor dietary intake of iron, high rate of infection and worm infestation as well as the social norm of early marriage and adolescent pregnancy. During this stage the requirement of nutrition and micronutrients is relatively high.

The WHO has defined adolescence as the age period between 10 to 19 years of age for both the sexes (married and unmarried){5}.This is the formative period of life when the maximum amount of physical, psychological, and behavioral changes take place.

Anemia affects mainly the women of child bearing age group, young children and adolescent girls. {6-9}

In females, adolescence marks the beginning of the menstrual cycle or reproduction, Were there is blood loss Every month for

three to Four days Adolescents gain 30% of their adult weight and more than 20% of their adult height between 10-19 years, which we call as the growth spurt{10}.

Adolescent girls are at a high risk for anaemia Secondary to malnutrition and Regular Menstrual Blood Loss and Inadequate nutrition during adolescence can have serious consequences throughout the reproductive years of life and beyond{11}.

Normal haemoglobin range according to age{12}:

Age	Hb (Range in gm/dl)
Newborn (< 1 week old)	14 - 22
Children (1-15 yrs)	11 - 15
Adults men	14 - 16
Women	12 - 15
Non-pregnant women and children (6 – 14 yrs)	< 12

According to the WHO criteria, the cut off level of the haemoglobin concentration in blood for the diagnosis of anaemia is less than 11gm/dl for pregnant women and for children agedbetween 6 months and 6 years, less than 12 gm/dl for non-pregnant women and children who are aged 6-14 years old, and less than 13 gm/dl for adult males. {13}

Classification of the anaemia according to its severity{10}]

Anaemia Hb (range in gm/dl)	Anaemia Hb (range in gm/dl)
Mild	10-11.9
Moderate	7-9.9
severe	<7

As anemia is classified into three degree according to WHO: mild, moderate and severe. Hb cut-off values of anemia were 10.0-11.9 g/dl (mild), 7.0-9.9 g/dl (moderate) and <7.0g/dl (severe).

The reasons for the high incidence of anaemia among the adolescent girls are
1. Increased iron requirements because of growth.
2. Menstrual loss
3. Discrepancy between the high iron need for haemoglobin formation and low intake of iron containing foods.
4. As practice of open air defecation is seen in remote rural villages, Bare Foot walking increases Risk of Hook worm Infestation and also other Soil-Transmitted Helminths (Ascarislumbricoides, Trichuristrichiura).

The prevalence of anemia in the developing countriestends to be three to four times higher than in thedeveloped countries{14}.The magnitude ofthe anemia has been well-documented in pregnantwomen and infants, Recent studies on theprevalence of anemia have been on preschoolersonly, {15,16} so there is a need for more studies related toanemia in school children.

This study was undertaken to determine the prevalence of anemia among adolescent school girls residing in Ashram School of Raigad District, India.

MATERIAL AND METHOD
Experimental procedure Blood was collected by finger prick method, 20 microliter of blood sample was mixed with 5 ml of Drabkin's solution at the spot by micropipette. Hemoglobin in the blood is converted into cyanometh hemoglobin.

The absorbance of cyanometh hemoglobin was measured at 540 nm by photoelectric colorimeter on the same day of sample collection. Mild anemia was defined as hemoglobin level of 10-12.9 g/dL in males and 10-11.9 g/dL in females, moderate anemia was defined as hemoglobin of less than 7-9.9 g/dL and severe anemia as hemoglobin less than 7 g/dL.[10]

RESULT
TABLE:- 1 Distribution of study participants in relation to anemia

	Study Participants	
Anemic	210	99.52 %
Non Anaemic	1	0.47 %
Total	211	100 %

Table 1 shows the prevalence of anemia in Ashram school girls of Raigad District.Out of 211 Adolescent girls whose haemoglobin status was assessed 99.52 % were found to be Anaemic.
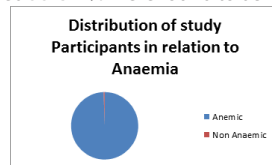

Distribution of study Participants in relation to Anaemia

■ Anemic
■ Non Anaemic

TABLE 2 Shows Distribution of study participants in relation to the severity of the anemia.

WHO Category	No of Students	% of
Normal(13-15-5 g/dL)	1	0.47%
Mild (10 -12.9 g/dL)	58	27.49%
Moderate(7 -9.9 g/dL)	152	72.04%
Severe(<7 g/dL)	0	0.00%

Severity of Anaemia

■ Normal(13-15-5 g/dL)
■ Mild (10 -12.9 g/dL)
■ Moderate(7 -9.9 g/dL)
■ Severe(<7 g/dL)
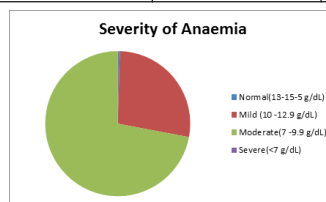
Out of 211 Adolescent school girls only 1 student was found normal, 72 % had moderate anaemia, followed by 27 % had Mild anaemia. No one had severe anaemia.

DISCUSSION
The results of the study indicated that the prevalenceof anemia was 99% in the Ashram school children of Raigad districtOut of 211 Adolescent school girls.

In the present study, the prevalence of anemia was found to be 99%. Rana et al {17} and Seshadri et al {18} reported a lower prevalence of 60% and 63% respectively. Chaturvedi et al {19} ,Kotecha et al {20} and Agarwal {21} reported a prevalence of 73.7%, 74.7% and 47.6% respectively. These differences in the prevalence of anemia may be due to difference in the study area and School Children's were not in dormitory/ Hostel . WHO / UNICEF {22} has suggested that the problem of anemia is of very high magnitude in a community when prevalence rate exceeds 40%. the problem of Anaemia in these adolescent girls with a prevalence of 99% should be considered serious & calls for an action.

The mean hemoglobin in the present study was 9.3 ±1.7gm/dl which was lower than that reported by Mehta et al{23} (10.6±1.2gm/dl) and also lower than Kotecha et al {20}reported as 11.8 ±1.4g/dl. The prevalence of severe, moderate and mild anemia was 0.0%, 72.04% &27.49% respectively. Study done byPatnaik S et al 2013{24} found theprevalence of anaemia among adolescent girls in arural area of Odisha to be 78.8%, mean haemoglobinlevel to be 10.84+1.05g/dl and 75.63% & 24.37% girlssuffering from mild and moderate degree of anaemia, which is also on Higher side compared to present study.

Study done by M.V. kulkarni (2012){25}found theprevalence of anaemia among adolescent girls in arural area of Nagpur, Maharashtra 90.1% girls were found to beanaemic which is very similar compared to our study.

Toteja G S et al{26} reported 90.1% prevalence ofanemia among adolescent girls from 16 districtsof India which is similar to the present study. RGawarikaet al {27} found 96.5% anemic adolescentgirls of weaker economic group which is also similar to our present study. A Variable prevalence(23.9%-81.8%) of anemia in adolescent girls hasbeen reported{17-21,23-27} in different studies.

National Nutritional Anaemia Prophylaxis/ Control programme has been in action for a long time now. Pregnant women, preschool children and adolescent girls are among the beneficiaries of this

programme and are expected to get IFA prophylaxis and treatment. The Government of India has reiterated the need tofocus on adolescent health as a part of an integratedapproach for reproductive, maternal, new born,child and adolescent health (RMNCH+A) whichessentially looks to address the issue of anaemiaacross all age groups through National Iron +Initiative. The Weekly Iron and Folic AcidSupplementation (WIFS) scheme is addressingnutritional (iron deficiency) anaemia amongstadolescents (boys and girls) in both rural and urbanareas. As articulated in 12th Five Year Plan one of thecoverage targets for key RMNCH+A interventions for2017 is to reduce anaemia in adolescent girls (15-19years) at annual rate of 6% from the baseline of 56%(NFHS 3) (6).

High prevalence of mild and moderate anemia demands due emphasis so as to bring down total prevalence of anemia in adolescent girls.Our study provides an indication to initiate the anemiaprophylaxis measures for adolescent girls in India includingnutrition education in schools.

CONCLUSION

In present study we identified that 99 % of the Aashram school girls were suffering from anaemia. Majority have Moderate anaemia with prevalence of 72 % followed by Mild Anaemia with prevalence of 27 %. Prevalence of anaemia (99%) in adolescent girls in this area is a public health concern.This indicated Moderate category of public health significance (40% or higher) as per WHO (5). The high prevalence of mild and moderate anaemia demands due emphasis on iron and folic acid supplementation and health education on the consumption of iron rich foods, so as to bring down the total prevalence of anaemia among the adolescent girls. Health education along with good quality of iron rich nutrition and Deworming drugs can prevent the prevalence of anaemia. Anaemia is significant problem in rural adolescent girls studying in Ashram School/ Shala of Raigad district.

LIMITATIONS OF THE STUDY

Fewimportant factors associated with anemia likenutritional status, BMI of Students, History pertaining to any drugs: Consumption of iron or folic acidtablets, open air defecation, worm infestation, Menstrual History – date of Menarche etcAppropriate History was not asked and are not included in the study.

CONFLICT OF INTEREST

The authors have no conflict of interest.

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