**ORIGINAL ARTICLE**

# PREVALENCE OF ANEMIA AMONG ADOLESCENT GIRLS IN AN URBAN SLUM

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## ABSTRACT

**Introduction:** Nutritional anemia is one of India's major public health problems. Adolescence is a vulnerable period in the human life cycle for the development of nutritional anemia. Anemia in adolescent girls contributes to maternal and foetal mortality and morbidity in future. Most of the health care services in India are for mother and child group.

**Objectives:** To estimate prevalence of anemia among adolescent girls in an urban slum and to study socio-demographic and menstrual factors associated with it.

**Material and methods:** A cross sectional community based study was conducted among 272 adolescent girls in an urban slum area under Urban Health Training centre, department of Community Medicine, NKP Salve Institute of Medical science, Nagpur from June 2009 to February 2010. Out of five areas one area was selected by simple random sampling. Information regarding socio-demographic and menstrual factors was recorded in pre-designed, pre -tested proforma. Hemoglobin estimation was done by Sahli's haemoglobinometer. Data was analyzed by mean, standard deviation and chi square test.

**Results:** Prevalence of anemia was found to be very high (90.1%) among adolescent girls. Majority of the girls were having mild or moderate anemia (88.6%). A significant association was found between adolescent girl's education, mother's occupation and anemia. No association was found between menstrual factors and anemia. **Conclusions**-Nutrition education along with nutritional supplementation and iron folic acid tablets should be provided to all girls.

**Keywords**: Prevalence, anemia, adolescent, urban slum

## INTRODUCTION

World Health Organization has defined 'adolescence' as a period between 10 and 19 years[1] .Adolescence in girls has been recognized a special period of transition from girlhood to womanhood. Adolescent girls constitute one fifth of the female population in the world.

Overall health status of a person is judged on level of hemoglobin of a person. Prevalence of anemia is higher in girls in low socioeconomic status; In addition it gets precipitated by blood loss during menstruation. Anemia in adolescent girls in future attributes to high maternal mortality rate, high incidence of low birth weight babies, high perinatal mortality and fetal wastage. So the present study was conducted to find out prevalence of anemia in an urban slum of Nagpur, Maharashtra and to study some of the socio-demographic and menstrual factors associated with it.

## MATERIAL AND METHODS

The Urban health training centre at Jaitala, Nagpur is urban field practice area attached to the department of Preventive and Social Medicine NKP Salve institute of Medical

Science, Nagpur. Total population covered by urban health training center is 25000.The field practice area is divided into five slum areas, out of which one area i. e. Ramabai Ambedkar Nagar was selected by simple random sampling (lottery method).The population of the area is approximately 3000. Considering P=0.7, with 10% error, the sample size calculated was 227 [2]. But for a better coverage, it was decided to include all eligible adolescent girls in the study. All unmarried, nonpregnant, nonlactating adolescent girls (10 to 19 years) were included in the study (n=272).

After obtaining permission from Institutional Ethical Committee, a community based cross sectional study was carried out by a medico social worker from June 2009 to February 2010. After getting informed consent, information regarding socio-demographic and menstrual factors was recorded in pre-designed, pre - tested proforma. Socio-demographic status was estimated by modified B. G. Prasad's classification. The adolescent girls were called to Urban Health Training center for hemoglobin estimation. Due to feasibility and cost effectiveness hemoglobin estimation was done by Sahli's haemoglobinometer. For interpretation of anemia, cut off point for Hemoglobin % was taken as <12 gm/dl.[3] The severity of anemia was graded as mild (10 to <12 gm /dl), moderate (7 to <10 gm /dl) and severe (<7 gm /dl) [4]. Statistical analysis was done by mean, standard deviation and chi square test.

## RESULTS AND DISCUSSION

Out of 272 adolescent girls in the study population, 245 (90.1%) girls were found to be anemic. Majority of the girls (88.6%) were having mild to moderate anemia and only1.5% girl were severely anemic. (Table no. I). Overall mean hemoglobin level was 10.33.±1.34.

**Table 1: Distribution of anemia according to severity among adolescent girls (n=272)**

| Hb (g/dl) | Number of girls (%) |
|-----------|---------------------|
| <7 | 4 (1.50) |
| 7 to <10 | 82 (30.15) |
| 10 to <12 | 159 (58.45) |
| ≥ 12 | 27 (9.90) |
| **Total** | **272 (100)** |

There was a declining trend of anemia with increase in the age of the girl. But it was statistically not significant. Most of the girls i.e.228 (90.48%) belonged to the socioeconomic class III, IV, V (lower middle, upper lower &lower). Literacy rate among the girls was found to be 100%. An inverse relation between education of girl and anemia was observed. As the level of education of girls increases, prevalence of anemia decreases. This was found to be statistically significant (P<0.05). Girls with better level of education may be more aware regarding their own nutrition. This may be the reason for the present finding of the study.

Adolescent girls with mother's occupation as service or business were less prevalent for anemia as compared to the girls with mothers as housewives or laborers. Mothers who are earning may be able to spend better on food and nutrition. Factors like girl's age, socio-economic status, type of family, mother's education was not significantly associated with anemia (table no. 2).

Out of 272 girls, 214(78.67%) girls have attained menarche. Mean age at menarche was 13.15±1.34 and the range was from 10 to 16 years. Higher prevalence of anemia was found to be in girls with attainment of menarche (90.65%) as compared to girls who did not attain menarche (87.93%). Prevalence of anemia was slightly higher in girls below 14 years (92.2%) but status of menarche and menarcheal age was not significantly associated with anemia (P>0.05) (table no III). It may be due to very high prevalence of anemia in the study group.

**Table 3: Menstrual factors and Anaemia**

| Status of menarche (n=272) | Girls with Anaemia | P Value |
|----------------------------|--------------------|---------| 
| Menarche Not Attained (n=58) | 51 (87.93) | 0.538 |
| Menarche Attained (n=242) | 194 (90.65) | |
| <14 years (n=103) | 95 (92.2) | 0.44 |
| ≥14 years (n=111) | 99 (89.2) | |

Figure in bracket show percentage

Toteja G S et al[5] reported 90.1% prevalence of anemia among adolescent girls from 16 districts of India which is similar to the present study. R Gawarika et al[6] found 96.5% anemic adolescent girls of weaker economic group which is more than present study. A Variable prevalence (23.9%-81.8%) of anemia in adolescent girls has been reported[7-13] in different studies.

**Table 2: Association between Socio-demographic factors and anemia (n=245)**

| Factor | No. of girls (N=272) | Girls with anemia No (%) (n=245) | X2 | Pvalue | OR |
|---|---|---|---|---|---|
| Age of girls (years) | | | | | |
| 5-12 | 64 | 61 (95.3) | 2.9 | 0.084 | - |
| 13-15 | 73 | 66 (90.4) | | | |
| ≥16 | 135 | 118 (87.4) | | | |
| Socio-economic status | | | | | |
| I | 4 | 3 (75) | 0.198 | 0.65 | - |
| II | 16 | 14 (87.5) | | | |
| III | 62 | 55 (88.7) | | | |
| IV | 146 | 135 (92.5) | | | |
| V | 44 | 38 (86.4) | | | |
| Type of family | | | | | |
| Nuclear | 240 | 215 (89.6) | 0.18 | 0.67 | - |
| Joint | 32 | 30 (93.7) | | | |
| Girl's education | | | | | |
| ≥ Graduate | 41 | 8 (83.7) | 4.11 | 0.0425* | 1 |
| HSC | 47 | 7 (87) | | | 1.31 |
| SSC | 36 | 3 (92.3) | | | 2.34 |
| Primary & middle | 121 | 9 (93.1) | | | 2.62 |
| Mother's education | | | | | |
| Illiterate | 38 | 34 (89.5) | 2.49 | 0.47 | _ |
| Primary & middle | 118 | 110 (93.2) | | | |
| SSC | 62 | 54 (87.1) | | | |
| HSC | 43 | 38 (88.4) | | | |
| ≥ Graduate | 11 | 9 (81.8) | | | |
| Mother's occupation | | | | | |
| Service | 16 | 4 (80) | 4.64 | 0.03* | 1 |
| Business | 4 | 1 (80) | | | 1 |
| Labourer | 62 | 9 (87.3) | | | 1.72 |
| Housewife | 163 | 13 (92.6) | | | 3.13 |

* Significant

Few studies[10, 12] reported association between education of girl and anemia similar to the present study. CMS Rawat et al[8], Choudhary S and Dhage VR[9] also found no association between age of girl and anemia. Verma et al [13] reported no association between mother's education, type of family and anemia that is similar to the present study. Various authors [7,9,12] found association between socioeconomic status and anemia, which is contradictory to the present study. As maximum number of girls in the present study were from lower socio-economic class. This may be one of the reasons for such finding of this study. Few studies[9, 12] reported no association between status of menarche and anemia that is similar to the present study.

Looking to the grave consequences of anemia in future, a high prevalence of anemia (90.1%) found in urban slum adolescent girls is alarming. A statistically significant association was found between education of girl, occupation of mother and anemia but not with the other socio-demographic factors. No association was found between status of menarche, menarcheal age and anemia.

There is an urgent need to develop interventional programmes in these slum areas in the form of nutritional supplementation along with prophylaxis of iron-folic acid tablets for prevention of anemia. Regular nutritional education sessions should be carried out to increase awareness in adolescent girls regarding anemia.

## CONCLUSIONS

## LIMITATIONS OF THE STUDY

As this article is a part of a research project few important factors associated with anemia like nutritional status, consumption of iron folic acid tablets, open air defecation, worm infestation etc were not included in the study.

## ACKNOWLEDGEMENT

## REFERENCES

1. Programming for adolescent health and development: WHO Tech.Rep.Sr.no 886; 1996. 2.

2. Lwanga SK, Lemeshaw S. Sample size determination in health, a practical manual: WHO; 1991.

3. Nutritional anemia: WHO Scientific Group. Tech.Rep.Ser. No 405; 1968. 5-15.

4. Control of Nutritional Anemia with special Reference to Iron Deficiency: WHO Tech.Rep.Ser.No 580; 1975.

5. Toteja GS, Singh P, Dhillon BS et al. Prevalence of anemia amongst pregnant women and adolescent girls in 16 districts of India. Food Nutr Bull. 2006; 27:311-316.

6. Gawarika R, Gawarika S, Mishra AK. Prevalence of anemia in adolescent girls belonging to different economic groups. Indian J Community Med.2006;31:287-288

7. Basu S, Basu S, Hazarika R et al. Prevalence of anemia among school going adolescents of Chandigarh. Indian Pediatr. 2005; 42:593-97.

8. Rawat CMS, Garg SK, Singh JV et al. Sociodemographic correlates of anaemia among adolescent girls in rural area of district Meerut. Indian J Community Med.2001; 26:173-175.

9. Choudhary SM, Dhage VR. A study of anemia among adolescent females in urban area of Nagpur. Indian J Community Med.2008; 33:243-245.

10. Rajaratnam J, Abel R, Ashokan JS et al. Prevalence of anemia among adolescent girls of rural Tamil Nadu. Indian Pediatr.2000; 37:532-536.

11. Singh J, Singh JV, Srivastava AK. Health Status of Adolescent Girls in Slums of Lucknow. Indian J Community Med. 2006; 31:102.

12. Kaur S, Deshmukh RR, Garg BS. Epidemiological correlates of nutritional anemia in adolescent girls of rural Wardha. Indian J Community Med. 2006; 31:255-258.

13. Verma A, Rawal VS, Kedia G et al. Factors influencing anemia among girls of school going age (6-18 years) from slums of Ahmedabad City. Indian J Community Med. 2004; 29: 25-26.