



A STUDY ON ASSESSMENT OF SEVERITY OF ANAEMIA AMONG URBAN AND RURAL CHILDREN OF BELAGAVI, KARNATAKA

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ABSTRACT

Introduction: Anemia is the most prevalent worldwide nutritional problem, mainly by iron deficiency. Iron deficiency anemia leads to weakness, poor physical growth, and a compromised immune system, decreasing the capacity to fight infections and thereby increasing morbidity and is also found to impair cognitive performance in a child.

Objective: To assess the severity of anaemia among urban and rural children of Belagavi

Methodology: Government aided schools from Vantamuri PHC and Ramnagar UHC were selected for the study. Probability proportionate to the size sampling technique was used to select sample from each school. Students were selected from each class by simple random sampling. Hemoglobin estimation was done by using Sahli's Acid Hematin method.

Results: Prevalence of anaemia among school children in Belagavi was found to be 47.9%. A high prevalence of 57% was seen among girls and 40.5% of the boys were anaemic. Prevalence was more in rural area i.e. 52.7% compared to that of urban i.e. 43%. Mild anaemia was found to be more prevalent in both urban and rural children i.e. 28.7% and 29.7% respectively.

Conclusion: The urban and rural areas in our study fall in to communities of severe public health significance (prevalence >40%). There was a higher prevalence of mild anemia as compared to moderate and severe anemia.

Keywords: Assess, severity, anaemia, urban, rural, Belagavi

INTRODUCTION

Anemia is the most prevalent worldwide nutritional problem, mainly by iron deficiency. Its prevalence is increasing among young children and women of childbearing age.¹ Prevalence of anemia is high in developing countries, due to poverty, inadequate diet, worm infestations, pregnancy/lactation and poor access to health services.² Iron deficiency anemia leads to weakness, poor physical growth, and a compromised immune system, decreasing the capacity to fight infections and thereby increasing morbidity and is

also found to impair cognitive performance in a child and delay psychomotor development.

The word adolescence is derived from the Latin word, 'adolescere'; meaning "to grow, to mature".³ Adolescent is defined by WHO as a person between 10-19 years of age. The world is home to 1.2 billion individuals aged 10-19 years⁴. World's adolescent population has been facing lot many nutritional challenges, iron deficiency anaemia is one among them, which affects their development of growth both physically and mentally. Amidst all

these they remain a largely neglected, unaccountable and difficult to reach population.

In girls, adolescence marks the beginning of the menstrual cycle or reproductive cycle. Adolescents gain 30% of their adult weight and more than 20% of their adult height, between 10-19 years, which we call it as growth spurt.⁵ To combat anemia during adolescence, with far reaching benefits in terms of safe motherhood and healthier future generations, an initiative called "12 by 12 initiative" was launched on 23rd April 2007 at Delhi, by Federation of Obstetrics and Gynecological society of India (FOGSI), in collaboration with Govt. of India, WHO and UNICEF⁶.

The health status and health problems vary in rural school children because of low socio-economic conditions, low standards of living, poor hygiene and inadequate sanitation. During the school hours the overcrowding in classroom, poor sanitary environment along with inadequate arrangements for drinking water and toilet facility all contribute to lowering of general health standards. Similarly in Urban children, though with most of sanitary facilities available to them, there has been increase in anaemia prevalence recently. Considering this our study was planned to assess the severity of anaemia among urban and rural school children of Belagavi.

METHODOLOGY

Government aided schools from Vantamuri PHC and Ramnagar UHC, which are the field practice areas of department of community medicine J.N.medical College, were selected for the study. Sample size was calculated to be 400 for urban area and 400 for rural area (The sample size of 400 was calculated by using the formula $n = 3.84pq/d^2$, assuming the prevalence of anaemia as 50%, with relative precision of 10% at 95% confidence). Probability proportionate to the size sampling technique was used to select sample from each school. Students were selected from each class (8th -10th Std) by simple random sampling using the student register till desired sample size was met. Permission was obtained from respective Heads of the schools before initiation of the study. Written consent from the Head of the school was taken. Student's assent was also obtained. A pre-designed and pretested questionnaire was used to collect the data. Haemoglobin estimation was done in all students of the study by using Sahli's Acid Hematin method⁷.

Hemoglobin level was used to assess the anemia & severity based on cut off values by WHO. If Hb% <12gm%, participant was considered Anaemic.⁸

Criteria for severity:

- Mild anemia: Hb< 11.9 to 10gm Hb/100 ml blood
- Moderate anemia: Hb<9.9 to 7gm Hb/100 ml blood
- Severe anemia: Hb<7gm Hb/100 ml blood

The study was approved from Institutional Ethics Committee for Human Subject's Research, Jawaharlal Nehru Medical College, Belgaum.

Data was analyzed using percentages, Z test and chi-square test appropriately with the help of Statistical Package for Social Sciences (SPSS), ver 21.0.

RESULTS

In urban area, boys were 224 (56 %) and girls were 176 (44 %). In Rural area, boys were 218 (54.5 %) and girls were 182 (45.5 %). In urban schools 273 (68.25%) of children were Hindus, 116 (29%) were Muslims and other religion constituted to 11 (2.75%) of them. In Rural schools 309 (77.25%) of children were Hindus, 78 (19.5%) were Muslims and other religion constituted to 13 (3.25%) of them. Table 1 depicts age wise distribution of children in two areas.

Prevalence of anaemia among school children in Belagavi was found to be 47.9% (383). A high prevalence of 57% was seen among girls and 40.5% of the boys were anaemic. Prevalence was more in rural area i.e.52.7% compared to that of urban i.e. 43% and this difference was found to be statistically significant, $p=0.006$. (Table 2).

Table 1: Age wise distribution of participants

Age (years)	Urban children (%)	Rural children (%)
13	95 (23.7)	76 (19)
14	136 (34)	134 (33.5)
15	114 (28.5)	121 (30.2)
16	55 (13.7)	69 (17.2)
Total	400	400

Table 2: Prevalence of anaemia based on area and sex

Sex	Total Children	Anaemic children	Prevalence %
Urban			
Girls	176	88	50
Boys	224	84	37.5
Overall	400	172	43
Rural			
Girls	182	116	63.7
Boys	218	95	43.6
Overall	400	211	52.7

$Z = 2.76$ $p = 0.006$, P value indicates statistical significant difference of anaemia prevalence between rural and urban children overall

Table 3: Grading of anaemia based on severity as per the area of residence

Anaemia	Urban children (%)	Rural children (%)
Severe	9 (2.25)	17 (4.25)
Moderate	48 (12)	75 (18.7)
Mild	115 (28.7)	119 (29.7)
Normal	228 (57)	189 (47.2)
Total	400	400

$\chi^2 = 12.104$ Df = 3 p = 0.007

Table 4: Grading of anaemia on severity with respect to sex

Sex & Severity of Anemia	Urban (%)	Rural (%)	Overall (%)
Girls			
Mild	53 (30.1)	65 (35.7)	118 (40)
Moderate	29 (16.4)	41 (22.5)	70 (19.5)
Severe	6 (3.4)	10 (5.5)	16 (4.4)
Boys			
Mild	62 (27.7)	54 (24.8)	116 (26.2)
Moderate	19 (8.5)	34 (15.6)	53 (12)
Severe	3 (1.3)	7 (3.2)	10 (2.3)
Total			
Mild	115 (28.7)	119 (29.7)	234 (29.2)
Moderate	48 (12)	75 (18.7)	123 (15.3)
Severe	9 (2.2)	17 (4.2)	26 (3.2)

Mild anaemia was found to be more prevalent in both urban and rural children i.e. 28.7% and 29.7% respectively. Almost double the prevalence of severe anaemia was seen among rural children compared to that of urban children (4.2% vs 2.2%). This difference was found to be statistically significant with $p=0.007$ (Table 3). Overall severe anaemia was seen more prevalent among girls (4.4%) compared to boys (2.3%). Percentage of rural girls with moderate and severe anaemia constituted 28% which was more when compared to urban girls which constituted 19.8%. Similarly boys of rural school had higher percentage of moderate and severe anaemia when compared to that of urban school boys (18.8% vs 9.8%) -Table 4.

DISCUSSION

In our study prevalence of anaemia was more than 40% in both urban and rural areas. As per WHO guidelines the urban and rural areas in our study fall in to communities of severe public health significance.⁹ An urban rural comparison study in Chandigarh done in 2002 showed that anaemia was significantly less among urban school children as compared to rural children, (14.61% vs 25.4%).¹⁰ Both girls (34.8%) and boys (15.3%) of rural group were significantly more anaemic than girls (21.5%) and boys (6%) of urban group. A study done in urban Meerut in 2012, among adolescent boys showed prevalence of anaemia to be 42.8%.¹¹ An-

other study conducted in 2011 in Multannagar, Meerut showed prevalence of 31.6% among adolescent boys and 52.8% among girls.¹² On contrary in our study urban boys had prevalence of 37.5%, the difference in the prevalence may be due to different study areas, different cut off used for anaemia and different age group which included 10-19 years.

In our study a large number of rural school children had moderate and severe anaemia compared to that of urban children. This difference may be because of poor access to health care, lack of awareness, poverty, open air defecation and illiteracy which is generally seen more in rural area. Poor nutrition status of most of the rural children adds on to the increased prevalence of anaemia. A study conducted in Chennai, Tamilnadu in 2012 showed 35% and 6% prevalence of moderate and severe anaemia respectively.¹³ A study conducted in rural Hassan in 2011 had 40.1% and 4.9% of moderate and severe anaemic girls.¹⁴ Though many programmes have been implemented by the government at school level like WIFS, it's disheartening to see such an increased prevalence. Proper monitoring of the programmes may help in its effectivity. Increasing the awareness of the teachers by refreshment training on WIFS would serve the purpose.

In our study we have found that around 30% of the school children have mild anaemia. This finding was similar to study conducted in Meerut in 2007¹⁵. Mild anaemia clinically most often goes undetected. School screening programmes for detecting anaemia have more chances to miss this group of population. It would, that's why be sensible to get hemoglobin tested of all the students rather than the screened ones. Sahli's method for estimating hemoglobin is not as accurate as other available methods. In context of our field setting and limited resource, it is the best alternative in comparison to only physical examination. The accuracy depends on level of hemoglobin and sensitivity and specificity is 64%, 70-100% in severe anemia.⁷ In future studies on identifying a better screening tool for mild anaemia feasible at the peripheral level would serve the cause. Prevention done during the milder forms is more practical thought rather than treating the severe forms of anaemia which would have already had an impact on the immune system, physical and cognitive development of the child.

CONCLUSION

Higher prevalence of anaemia was observed among rural high school children compared to the urban counterpart. Prevalence of anaemia was

more among girls in both urban and rural areas. The urban and rural areas in our study fall in to communities of severe public health significance (prevalence >40%). There was a higher prevalence of mild anemia as compared to moderate and severe anemia in both boys and girls of urban and rural areas.

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