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Short Communication

Pattern of anaemia, determinants and weekly iron and folic acid supplementation programme among tribal adolescent girls attending a primary health centre in Wayanad, Kerala

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ABSTRACT

Anaemia is a major cause of concern during adolescence particularly among the persons of tribal origin. The objective of the study was to determine the pattern of anaemia, determinants and coverage of the weekly iron and folic acid supplementation (WIFS) programme among adolescent girls in a tribal area. A cross sectional study was conducted among 196 adolescent girls at a primary health care centre in tribal area of Kerala. Every alternate adolescent girl attending the centre was chosen over a period of three months. Assent and informed consent from accompanying parents was obtained. Haemoglobin was estimated by Sahli's method and peripheral smear prepared. Three fourths of the adolescent girls had iron deficiency anaemia; of which 48.64% had moderate anaemia 5.40% had severe anaemia and 1.6% had sickle cell anaemia. Adolescents belonging to Paniya tribe and those not consuming Iron and folic acid tablets under WIFS programme were three times (OR 2.95 95% CI 1.38,6.28) and two times (OR 2.5 95% CI 1.24, 5.11) respectively were more likely to be anaemic. Most (80%) of the anaemic girls were unaware about WIFS scheme and the intake of the iron supplementation was significantly higher in school going girls. Strengthening the WIFS scheme by targeting the vulnerable adolescent girls of Paniya tribe and out of school girls are of extreme importance in tackling the problem of anaemia among tribal adolescent girls.

Keywords: Adolescent girls, Anaemia, Tribal, WIFS

INTRODUCTION

Anaemia is a widely prevalent public health problem in India and adolescence is a particularly vulnerable period. Growth related increase in lean body mass, expansion in total blood volume and onset of menstruation taxes the iron supplements in a girl's body, making her more vulnerable to anaemia.[1] Anaemia during adolescence also diminishes the ability to concentrate, dwindles learning capacity, reduces appetite and often leads to irregular menstrual cycles.[1] This affects her in adulthood too, with such a mother often giving birth to low birth weight babies, delivering preterm or dying while giving birth.[1] Anaemia has been found to affect 96.5% of tribal women in the reproductive age group (15-45 years) of Wayanad district of Kerala which has the highest tribal population in the state at 36%.[2,3] Though, in general Kerala's health indicators are the best in India, the tribal population has the highest levels of undernutrition. A systematic review on anaemia in Kerala indicates a paucity of data on anaemia among tribal adolescent girls.[4] Being a hard to reach area and with the school dropout rate being high such studies are difficult to carry out in schools. Therefore, the objectives of the study were to assess the pattern of anaemia, determinants and coverage of the weekly iron and folic acid supplementation scheme (WIFS) programme among adolescents attending a primary care centre.

METHODS

After approval from institutional ethics committee, a cross sectional study was conducted among adolescent girls between 10-19 years age who attended outpatient department of a primary health care centre in Wayanad during months of June to August 2014. Every alternate adolescent girls attending the centre was chosen. The pattern of anaemia included determining the proportion of adolescents respondents with anaemia and the type of anaemia on peripheral smear examination. A pretested semi structured questionnaire was used to collect basic socio-demographic information, dietary habits, tobacco habits and menstrual history through interview technique. Anthropometric measurements like height and weight were also recorded by standardized equipment according to accepted standards of measurement.

Based on prevalence of anaemia among adolescent girls from studies in Kerala and with 95% confidence and 20% precision the minimum sample size was calculated to be 150, anticipating a non response rate of 30% the sample size is 196.[5] Assent and informed consent was obtained from the participating adolescents and their accompanying parents.

BMI was calculated and classified according to the Eliz health path for adolescents (EHPA) classification.[6] Girls with BMI less than 15 kg/m^2 were considered as underweight, BMI 15-22 kg/m^2 as normal and BMI of 22-25 kg/m^2 as overweight.

After obtaining consent, blood samples of participants were collected through finger prick, haemoglobin level was measured by Sahli's method and peripheral smear was also done. The smear was air dried, labelled, packed and transported to pathology laboratory of medical college. Uncooperative, pregnant or lactating respondents were excluded from the study. The haemoglobin levels were noted and classified according to WHO classification; haemoglobin levels of >12 gm% was considered normal, 11-11.9 gm% as mild, 10-10.9 gm% as moderate and less than 10 gm% as severe anaemia.[7] The smear was reported considering red blood cell morphology and presence of sickle cells. A total of 196 adolescent tribal girls in the age group of 10-19 years were included in the study. Data was tabulated using MS-Excel and analysis done using statistical package for social sciences version 20. The qualitative variables have been expressed using percentage and analysed using chi-square test, quantitative variables expressed as mean and standard deviation. All the factors with p value less than 0.2 in bi-variate analysis were put in the regression model and using step wise backward elimination technique the final model was derived.

RESULTS

The mean age of the study participant was 15.9±2.4 years. A third (32.7%) were school dropouts. Three fourths (78.1%) belonged to the Paniya tribe who are most marginalised. Around 15 (7.7%) girls in the study were married out of which one girl had a child as well. It was disturbing to find that 1 out of 3 girls (33.7%) used tobacco too (Table 1).

Dietary habits were poor in general with about a fifth unable to afford three meals a day. Only 20.4% and 4.59% consumed green leafy vegetables and meat regularly. About 90% girls had attained menarche with the mean age of attainment of menarche at 12.6±1.2 years (Table 1).

Table 1: Distribution of study respondents according to socio-demographic variables, dietary habits and nutritional status.

Variable	Frequency	Percentage (%)
Age (in years)		
11-16	107	54.60
>16	89	45.40
School		
Out of school	64	32.70
School going	132	67.30
Tribe		
Paniya	153	78.10
Kuruchiya	23	11.7
Kuruma	14	7.1
Tachadan Mupan and Kattunaicken	6	3.1
Marital status		
Unmarried	181	92.30
Married	15	7.70
Mother's education*		
Not educated	60	31.30
Educated	132	68.80

Continued.

Variable	Frequency	Percentage (%)
Mother's occupation*		
Home maker	130	68.10
Other employment	61	31.90
Tobacco use		
No	130	66.30
Yes	66	33.70
Type of diet		
Vegetarian	11	5.6
Non vegetarian	185	94.4
Number of meals per day		
1 time	4	2.0
2 times	34	17.30
≥3 times	158	8
Intake of green leafy vegetables		
Rarely	156	79.59
Often	40	20.40
Intake of meat		
Rarely	187	95.40
Often	40	4.59
History of worm infestation		
Yes	183	93.36
No	13	6.63
Menarche		
Attained	178	90.8
Not attained	18	9.2
Nutritional status		
BMI		
Under nourished	40	20.4
Normal	153	78.1
Over weight	3	1.5
Anaemia status		
Non Anaemic	48	24.50
Anaemic	148	75.50
State of anaemia		
Mild	68	45.94
Moderate	72	48.64
Severe	8	5.40
RBC morphology		
Normocytic hyochromic RBC	102	62.20
Microcytic hypochromic RBC	62	37.80
Sickle cell		
Present	1	0.60
Absent	163	99.39

Table 2: Independent predictors of anaemia among tribal adolescents.

Variables	Adjusted Odds ratio	95% CI	P value
Paniya tribe	2.95	1.38, 6.28	<0.009
Not taking iron and folic acid tablets	2.52	1.24, 5.11	<0.02

Three fourths (75.50%) of girls were anaemic with haemoglobin less than 12 gm/dl. Among all the anaemic girls, more than a half (54.04%) had moderate and severe anaemia. Out of 196 peripheral smears, 164 good quality smears were reported, of which 62 smears (37.8%) showed microcytic hypochromic blood picture and 1 (1.6%) was positive for sickle cells. Chronic dietary

energy deficit as indicated by BMI showed that one in five girls (20.4%) were underweight. Thus, nutritional deficiencies like anaemia and low BMI was widely prevalent (Table 1).

About 59.20% of participants were unaware of WIFS and only 52 percent of adolescent girls were taking oral iron and folic acid tablets. There was significant association between WIFS intake and school going status of adolescent girls ($p \leq 0.001$) (not in Table). Out of school adolescents were unaware about Weekly iron and folic acid supplementation scheme.

After logistic regression the determinants of anaemia were found to be adolescent girls belonging to Paniya tribe (OR 2.95 95% CI 1.38, 6.28; $p<.009$) and those not taking Iron tablets as part of WIFS scheme (OR 2.52 95% CI 1.24, 5.11; $p<0.02$) (Table 2).

DISCUSSION

In this facility based study, the proportion of adolescents with anaemia (69%) was found to be similar to the national family health survey-3 (65-75%) though it is greater than that among rural south Indian adolescents (34.7%).[5,8] Other studies among adolescents in schools in rural and semi-urban areas respectively have demonstrated a prevalence of 21% in central Kerala (Ettumannoor) to 53.5% in south Kerala.[9,10] Anaemia among an older age group of tribal women (15-45 years) was much higher at 96.5%.[2]

Though this a health facility based study and not representative of the level statistics, studies in other tribal communities reported a higher prevalence of anaemia at 88.8% in Vishakhapatnam, 87.9% in Chhattisgarh and 78.2% among Gujjar tribe in Jammu, indicating better nutritional status of tribes in Kerala.[11-13]

The nutritional status of the tribal adolescent girls was poor as indicated by 75% of anaemia and 20% with low body mass index. Prevalence of anaemia among Paniya tribal adolescent girls was three times higher compared to other tribal groups. This could be a reflection of the social marginalization, high levels of impoverishment, and poor access to health care that they face in general.[14]

Hence a more focussed anaemia control programme is required targeting this group. Weekly Iron and Folic acid programme is an important determinant of anaemia in this study. Another study from south Kerala has also indicated that the adolescents who take WIFS correctly had a prevalence of anaemia of 28% compared to 56.5% among those who were not consuming.[10,15] Out of school adolescents were not aware of the WIFS programme and iron tablets distribution. Hence it is imperative to strengthen the WIFS programmes through Anganwadis for the out of school children in this vulnerable community.

CONCLUSION

Strengthening the WIFS scheme by targeting the vulnerable adolescent girls of Paniya tribe and out of school girls are of extreme importance in tackling the problem of anaemia among tribal adolescent girls.

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