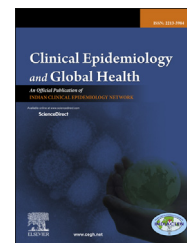




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Original Article

Prevalence and determinants of anaemia and effect of different interventions amongst tea tribe adolescent girls living in Dibrugarh district of Assam

Tulika Goswami Mahanta ^{a,*}, Bhupendra Narayan Mahanta ^b,
Pranab Gogoi ^c, Puspendra Dixit ^d, Vandana Joshi ^e, Sandip Ghosh ^f

^a Associate Professor, Department of Community Medicine, Assam Medical College, Dibrugarh, Assam, India

^b Associate Professor, Department of Medicine, Assam Medical College, Dibrugarh, Assam, India

^c Statistician, Maternal and Child Health Cell, Assam Medical College, Dibrugarh, Assam, India

^d Consultant for Women and Child Development, UNICEF, Assam, India

^e Nutrition Specialist, UNICEF, Assam, India

^f Secretary, Assam Branch of Indian Tea Association, Assam, India

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ABSTRACT

Problem considered: Anaemia, associated with lower productivity and higher sickness rate and absenteeism. Adolescent health has inter-generational effect. Morbidity status during adolescent has implication on future safe motherhood, optimum growth and development of foetus and children.

Aims: To assess, prevalence and determinants of anaemia and effect of different interventions amongst tea tribe adolescent girls.

Methods: A community based intervention study was conducted covering 16 tea estates of Dibrugarh district, Assam. Variables includes socio-demographic, environmental, anthropometry, history of present and past illness, clinical examination and laboratory investigation including haemoglobin, serum ferritin, sickling test and routine stool examination. Interventions like weekly IFA supplementation, dietary diversification, health promotion by monthly NHED, cooking demonstration, cooking competition and kitchen garden promotion was done. SPSS and EpiInfo software, used to calculate of rates, ratios, chi-square test, Fisher Exact test.

Results: Enrolments were 802, with mean age, 14.8 years. Anaemia prevalence was 96.3% with median serum ferritin, 22.9 ng/ml. Prevalence of sickle cell anaemia was, 12% and helminthiasis 84.20%. Health related complaints, significantly more frequent amongst older adolescents ($p < 0.000$). History of passage of worms (9.1%), night blindness (5.6%), weakness (62.1%), loss of appetite (37.5%), gum bleeding (23.6%), loose motion (13%), loss of weight (9.9%), menstrual problem (19.3%) were common. Following intervention mean

* Corresponding author. Tel.: +91 373 2301061, +91 9435032539 (mobile); fax: +91 373 2301061.

E-mail addresses: drtulikagoswami@gmail.com, tulika_gm@rediffmail.com (T.G. Mahanta).
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haemoglobin difference was 1.48 g/dl with 13.5% difference in prevalence. Associated morbidities showed significant improvement following active intervention.

Conclusions: High anaemia prevalence requires urgent attention to avoid preventable morbidities. Integrated different intervention implementation found effective in reducing the burden of anaemia and associated factor.

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1. Introduction

Anaemia, one of the World's nineteenth leading risk factor for death and disability adjusted life year (DALY) affecting both developing and developed countries and is an indicator of poor nutrition and health with major consequences for health, social and economic development of a population.¹ Nutritional anaemia, one of the major public health problems in India affecting almost 90% poor children, adolescent girls and women, considered as “female disease” causing red alert for Indian women.² Taller women with greater arm circumference were able to pluck more green leaves, earn higher wages and were absent less often indicating the effect of anaemia and productivity amongst tea tribe population.³

Adolescence, the formative period of life is defined by the World Health Organization as the age group of 10–19 years.⁴ Adolescence is one of the important stages of the life cycle in terms of health interventions as more than 33% of the disease burden and almost 60% of premature deaths among adults can be associated with behaviours or conditions that begin or occur during adolescence.⁵ An ICMR conducted study showed very high burden of communicable, non-communicable and nutritional disorders amongst tea garden population.⁶ As per SRS 2007–09 data, Assam is having the highest maternal mortality (380) of which tea garden community constitute the most.⁷ Dibrugarh has the world's largest area covered by tea gardens. The entire district is surrounded by tea plantations and has tea factories. Many tea gardens are more than 100 years old. Scarcity of reliable evidence in this group of population prompted us to conduct this study to assess the prevalence of anaemia and its determinants amongst tea tribe adolescent girls and also to see the effect of different interventions implemented in an integrated way.

2. Materials and methods

2.1. Setting

Assam is the World's largest tea growing region. More than 51% of India's tea – accounting for 1/6th of global tea production – is grown in the tea estates, of the country's

north-eastern state of Assam. Most of the workers are descendants of tribal communities brought to Assam from neighbouring states by the British to work on the tea estates in early 20th century, retained their unique tribal socio-cultural identity. They live within the estates in designated settlements called ‘labour lines’. Tea community represents approximately 17% of Assam's population and 27% of Dibrugarh district. Dibrugarh district is selected as it has 144 registered tea estates contributing to 27% of Assam production.⁸

2.2. Ethical statement

The study protocol was approved by the institutional ethics committee of Assam Medical College, and necessary permissions were obtained in addition from District Health Authority and Assam Branch of Indian Tea Association. After explaining study procedures, a written informed consent was sought from all eligible participants along with assent for inclusion of below 14 years participants, and those consenting were included in the study. In case a participant who could not read or write, verbal information was provided, and consent was recorded as a thumb impression in presence of two impartial witnesses. The surveys were preceded by meetings with community leaders to ensure community wide participation. All study participants found to be having morbidities were treated by Government supplied medicine through sub centres situated in the tea estates.

2.3. Sample size

Considering 68% girls as anaemic, with 5% relative precision and 95% confidence interval the required minimum sample size is 723. Taking 10% non-response rate and rounding up the sample size becomes 800.¹

2.4. Study design

It was a ‘community based before-after intervention study’. Multistage random sampling method was used for selection of study subjects. As the district has seven rural and one urban block having tea estates, therefore 16 tea estates were selected, two from each block using computerised random number. From each tea estates 50 adolescent's girls

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