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Effect of Date Ball on Haemoglobin Level of Rural and Urban Adolescent Girls

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ABSTRACT

Anaemia is one of the most important global health problems among the adolescents and more than two billion people worldwide are estimated to have anaemia, with majority coming from the developing countries like India. Its adverse health consequences affect people of all age-groups and can result from non-nutritional and nutritional factors. It is categorized as one of the 10 most serious health problems by the WHO. A comparative survey was conducted in schools of rural area and urban area of Valsad district. Total 100 adolescent's girls of 16 yrs old (50 from rural area and 50 from urban area were included in the study. The girls were supplemented 50 gm of dates balls for 48 days and the haemoglobin was estimated using Sahli's method. The results indicate that the desirable Hb level was increased from 60% to 87% in the rural area school subjects and 63% to 93% Hb level was increased in urban area school subjects. Less than 10 haemoglobin value increased from 34.8% to 69% in the pre and post blood test results. 96% of the total subjects Hb Values were increased after supplementation of Iron Rich date ball. Study can be conclude that iron rich Dates balls supplementation for a period of 48 days showed a positive impact on serum Iron level. It also improved the blood haemoglobin status of subjects. The study could atleast generate the awareness among the parents as well as the adolescent girl in rural and urban area schools of Valsad district.

KEYWORDS: *Iron deficiency Anemia, Adolesecence, Daily Feeding, Haemoglobin*

INTRODUCTION

A low level of Haemoglobin among adolescent girls was found, which was higher in low economic strata. It was seen that low level of iron affects overall nutritional status of adolescent girls.Iron-deficiency anaemia is the most common type of nutritional anaemia which results from long-term negative iron balance and is responsible for approximately 50% of all anaemia. It is a severe stage of iron shortage in which haemoglobin (or haematocrit) falls below the normal range. It is more widespread and severe in young children and women of reproductive age but it can be found in people of any age-group. Deficiency of iron usually develops slowly and is not clinically evident until anaemia becomes severe. (Killip et al., 2007) Accelerated development, hormonal changes, malnutrition, and starting of menstrual periods in girls are the major causes of iron-deficiency anaemia during adolescence, which may also lead to impaired perception and learning difficulties.

Adolescence is characterized by a large growth spurt and the acquisition of adult phenotypes and biologic rhythm. During this period, iron requirement increases dramatically in both boys & girls as a result of the expansion of total volume, the increase in lean body mass & the onset of menses in young females. The overall iron requirement increases from a preadolescent level of approximately 0.7-0.9mg fe/d to as much as 2.2mg fe/d or perhaps more in heavily menstruating young women. (Brotanek et al., 2007)

Iron deficiency anemia is the most common nutritional deficiency worldwide. It can cause reduced work capacity in adult and impair motor and mental

development in children and adolescents. (Rawat et al., 2001)

Anemia is a reduction in Red Blood Cells which in turn decrease the oxygen carrying capacity of the blood. Not a disease itself, anemia reflects an abnormality in RBC's number structure or function.(Chaudhari and Dhage, 2008)

Iron deficiency anemia is characterized by a defect in hemoglobin synthesis result in red blood cells that are abnormally small (microcytic) and contain a decreased amount of hemoglobin. The capacity of the blood to deliver oxygen to the body cells and the tissues is thus reduced. Iron deficiency anemia is associated with either inadequate absorption or excessive loss of iron. (WHO Report, 1999)

A cross-sectional study was conducted by Tupe R (2008) at Agharkar Research Institute, Pune, India, to explore the influence of dietary factors of iron bioavailability and socio-demographic conditions on blood iron status of married adolescent girls (MAG). The study included 173 MAG (15-19 years old) from urban slums near Pune city. Diet was assessed by two random 24-hour recalls. The age, weight, height, education, family size, income, physical work, and number of days of menstrual loss were recorded. Fasting blood was analyzed for hemoglobin and serum ferritin. The result shown that the mean bioavailable iron intake was 0.76+/-0.3 mg/day, which is one-half of the basal iron requirements of adolescent girls. The prevalence of iron deficiency was 25.1%, and anemia was seen in 46.4% of MAG. Multiple regressions including socio-demographic factors revealed that the family size, number of menstrual days lost and total bio available iron intake were the influencing factors for low iron status. In conclusion, there is a need to increase intakes of vitamin C and other micronutrients of the MAGs and to improve iron bioavailability through diet modifications.

MATERIALS AND METHODS

The study was conducted with the aim of determine the prevalence of anaemia among the school students by analyzing blood haemoglobin (Hb) and to evaluate their body mass index (BMI) and compare the data for rural and urban students before and after supplementation of date ball.

The study included 100 adolescent girls aged 16 years (50 girls from rural area and 50 girls from urban area), with different socioeconomic backgrounds, from two schools. The hemoglobin was estimated before supplementation of date ball using Sahli's method. (Toteja G.S., 2006) The height and weight were also measured using standard technique for all individual girls.

Following standard techniques were used for measurements –

Height:

Height in centimeters was marked on a wall with the help of a measuring tape. All subjects were measured against the wall without foot wear and with heels together and their heads positioned so that the line of vision was perpendicular to the body. A metal scale was brought down to the topmost pint on the head. The height was recorded to the nearest 1 cm.

Weight:

The weight was measured using a weighing machine (Bathroom Scale) with an accuracy of ± 100 gm. The subjects were asked to remove their footwear before measuring their weight. The scales were recalibrated after each measurement. Accuracy of the weighing scale was verified from time to time against known weights

Body Mass Index (BMI):

BMI of the study subject was calculated by using the formula weight (kg)/ height^2 (m^2). For grading proposed criteria of BMI of Asians and CDC (2010) was adopted. Children (6 to 17 years) and adults (18 and above years) with BMI below 18.5 were considered underweight whereas BMI at or above 25 were considered overweight.

Statistical Analysis:

Data thus generated were analysed using SPSS software.

RESULTS AND DISCUSSION

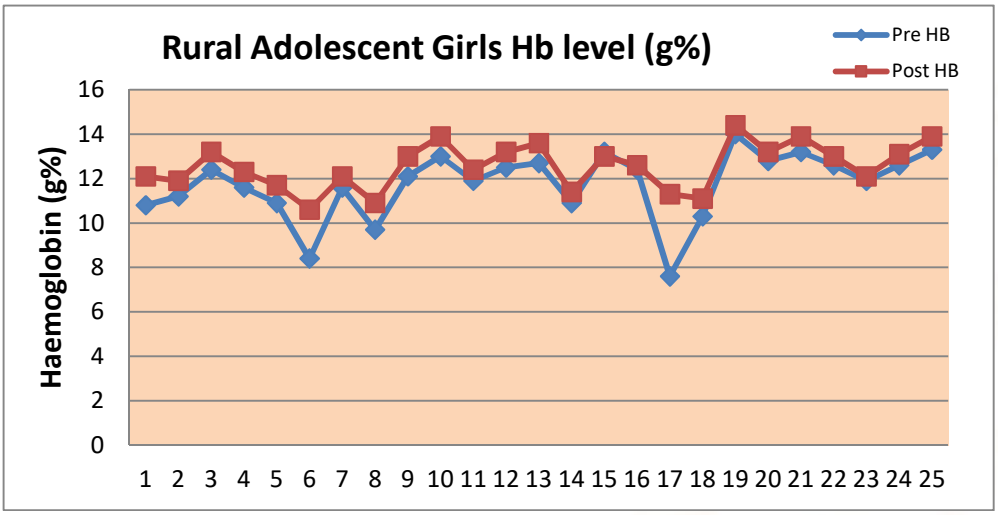

Figure 1: Comparison of Pre and Post HB Level of Rural Girls

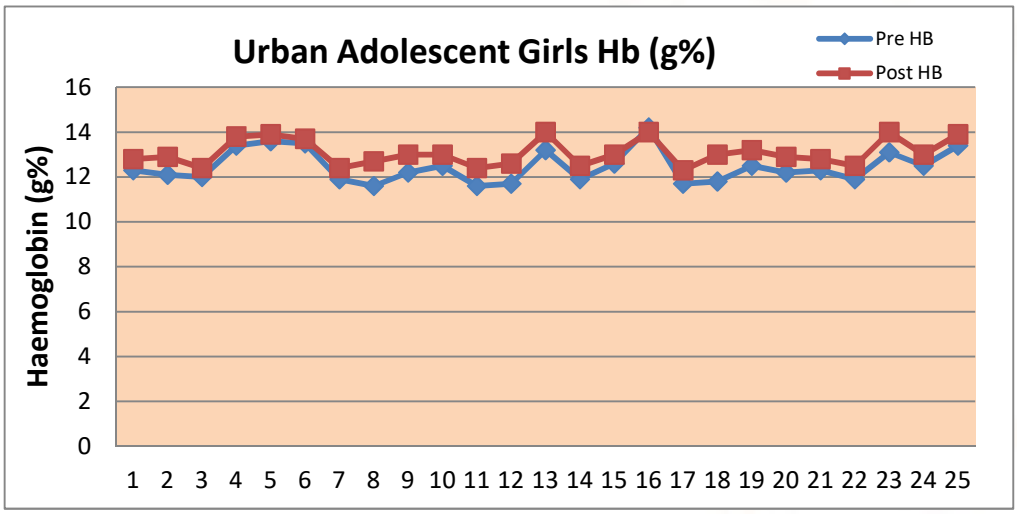

Figure 2: Comparison of Preans Post HB Level of Urban Girls

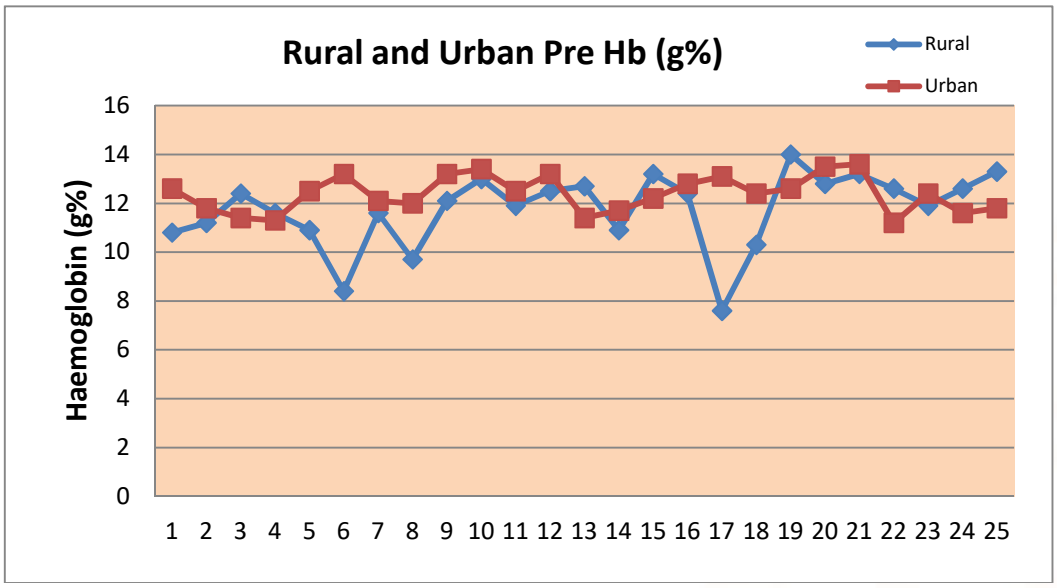

Figure 3: Comparison of Pre HB Level between Rural And Urban Girls

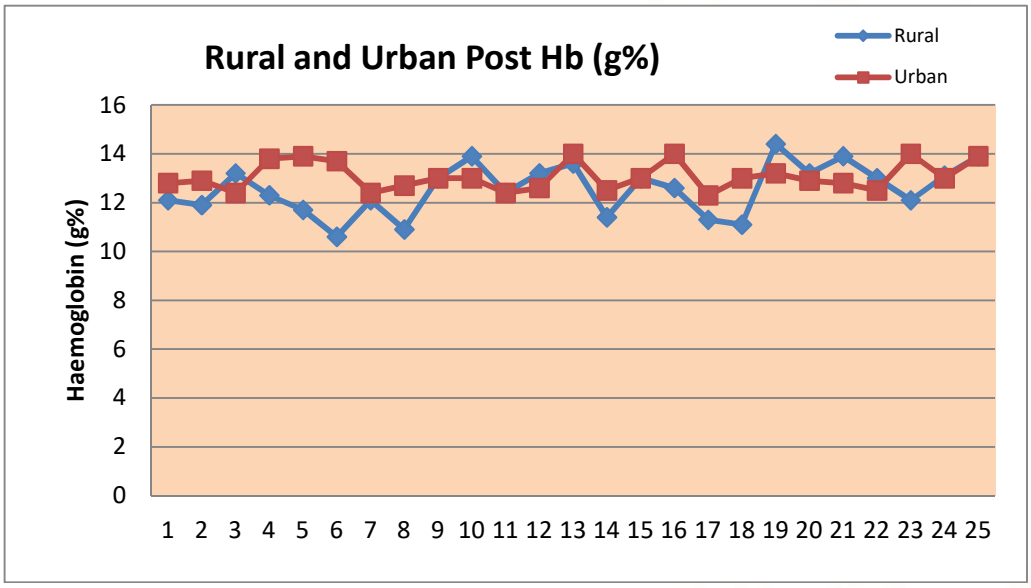

Fig.4 Comparison of Post HB Level between Rural and Urban Girls

About 97% of participants included in this study were early adolescents (16yrs) while 3% being later adolescents (17 yrs). 85.3% were from nuclear families, 31.5% of those belonged to families earning between INR 3000-5000. 39.8% of participants' parents were unskilled labourers, majority of them possessed high school education. 86.75% of participants had attained menarche, 13.3% had high menstrual bleeding. 81.6% of girls were non-vegetarian. Bivariate analysis shows significant association with type of family, weight, mother's educational status, type of school and diet pattern.

The study was conducted by Deshmukh P R (2008) in India to assess the effectiveness of a weekly iron-supplementation regimen among urban-slum, rural, and tribal girls of Nashik district, Maharashtra, India, using cluster sampling techniques. The result revealed that the overall prevalence of anemia came down significantly to 54.3% from 65.3% after administration of iron supplement. The decline was statistically significant in tribal girls (48.6% from 68.9%) and among rural girls (51.6% from 62.8%) but not among urban slum girls. The study concluded that weekly supplementation of iron to adolescent girls should be started to correct the iron stores of a woman before she becomes pregnant.

A study was done by Sen A (2006), Department of Food and Nutrition, M.S University of Baroda,

Gujarat, India, to assess the physical work capacity and cognition of underprivileged anemic schoolgirls

in Vadodara in early adolescence as compared to their non-anemic counterparts. Schoolgirls from four municipal primary schools in the age of 9 - 14 years were studied (n=230). Hemoglobin of subjects was assessed using standard methods. Physical work capacity was assessed using Modified Harvard's Step test and cognitive functions using selected tests from the modified Wechsler Intelligence Scale for Children (WISC). The result shown that the mean hemoglobin was 11.32 g/dL, and anemia prevalence was 67%. A higher number of steps were climbed and a shorter time was taken to revert to the basal pulse rate by non-anemic girls compared to anemic girls. Significantly lower scores in digit span and visual memory test were seen in anemic compared to non-anemic girls. The adverse impact of anemia remained after controlling for under nutrition .The study concluded was anemia is likely to adversely affect physical work capacity and cognition in young adolescent girls undergoing pubertal development.

CONCLUSION:

A low prevalence of anemia among adolescent girls was found, which was higher in low economic strata. The desirable Hb level was increased from 60% to 87% in the rural area school subjects and 63% to 93% Hb level was increased in urban area school subjects. Less than 10 haemoglobin value increased from 34.8% to 69% in the pre and post blood test results. 96% of the total subjects Hb Values (WHO report, 2006) were increased after supplementation of Iron Rich Khajoor balls

Iron rich Dates balls supplementation for a period of 48 days showed a positive impact on serum Iron level. It also improved the blood haemoglobin status of subjects. The study could at least generate the awareness among the parents as well as the adolescent girl in rural and urban area schools of Valsad district.

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