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A COMPARATIVE STUDY OF THE MENTAL FATIGUE STATUS OF ADOLESCENCE GIRLS

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Abstract:

Vitamins B_6 and B_{12}, among others, are directly involved in the synthesis of some neuro-transmitters. Vitamins B_{12} delays dementia (and blood abnormalities), provided it is administered in a precise clinical timing window, before the onset of the first symptoms. Adolescents who have a borderline level of vitamin B12 deficiency develop signs of cognitive changes. In the brain the never endings contain the highest concentration of vitamin C in the human body. Iron is necessary to ensure oxygenation and so produce energy in the cerebral parenchyma, and for the synthesis of neurotransmitters and myelin: iron deficiency a found in children with attention deficit/hyperactivity disorder. The findings of the present study will supply us good information to understand the mental fatigue and other health implications of anaemia on adolescent age girls so that proper strategies could be made to eliminate this nutritional problem amongst them with better pace and guide them to attain full potential growth and healthy life.

KEY WORDS: Mental fatigue, Iron, Vitamins, Energy, Diet.

INTRODUCTION

Over 50% of under-five children are stunted in India. They have sub-optimal vigor and stamina, poor neuromotor co- ordination, learning skills and mental capabilities. Vitamins and trace minerals are required for production of various enzymes, hormones and biochemical mediators for regulation of biological processes. They are required for energy production, synthesis of RNA and DNA and for providing protection against reactive oxygen-free radicals. Micronutrients are required for promotion of physical growth, sexual maturation and neuromotor development. A number of vitamins (vitamins A, E, C, D, B_2 Folic acid etc.) and trace minerals (iron, zinc, and selenium, copper) are recognized to boost both cell-mediated and humeral immune defenses of the body. Interaction between sub-optimal nutrition and occurrence of repeated infections is the leading cause of growth retardation in children in developing countries. Dietary inadequacies and recurrent infections interact in a mutually reinforcing manner to further aggravate nutritional status Calcium, phosphorus, vitamins A, C, D and K are required to maintain the integrity and mineralization of bones. Among various micronutrients, the role of zinc has been widely studied in experimental animals and human beings. Zinc is a constituent of over 200 metallo enzymes and is involved in a large number of biological processes.

Micronutrients are required for production of several enzymes and co-factors for a number of metabolic pathways. It has been well known that pellagra (niacin deficiency) leads to reduced cognition and dementia. A number of other B-complex vitamins especially B_1, B_2, B_4, B_{12} and folic acid are needed for synthesis of several neurotransmitters.

Fish and fish oils are important sources of omega-3 fatty acids and decosahexaenoic acid (DHA). Omega-3 fatty acids are credited to reduce cellular and vascular inflammation in the brain, promote vasodilatation and ensure integrity of brain cell membranes to keep them soft and pliable, DHA is the building material for fabrication of synaptic communications and constitute almost one-half of the total fat in the brain cell membrane h increases the level of feel good neurotransmitter serotonin and the memory boosting chemical acetylcholine.

However for long it was not fully accepted that food can have an influence on brain structure, and thus on its function including cognitive and intellectual. Vitamins B_6 and B_{12}, among others, are directly involved in the synthesis of some neuro-transmitters. Vitamins B_{12} delays dementia (and blood abnormalities), provided it is administered in a precise clinical timing window, before the onset of the first symptoms. Adolescents who have a borderline level of vitamin B12 deficiency develop signs of cognitive changes. In the brain the never endings contain the highest concentration of vitamin C in the human body (after the suprarenal glands). Iron is necessary to ensure oxygenation and so produce energy in the cerebral parenchyma, and for the synthesis of neurotransmitters and myelin: iron deficiency a found in children with attention deficit/hyperactivity disorder, Iron concentrations in the umbilical artery are critical during the development of the foetus, and in relation with the 1.Q.

in the child, infantile anaemia with its associated iron deficiency is linked to perturbation of the development of cognitive function. Iron deficiency anaemia is common, particularly in women and is associated for instance, with apathy depression and rapid fatigue when exercising. The full genetic potential of the child for physical growth and mental development may be compromised due to deficiency of micro marients. Children and adolescents with poor nutritional status are exposed to alterations of mental and behavioural functions that can be corrected by dietary measures, but only to certain extend.

Prevalence of anaemia and growth retardation (85%) wax extremely high in the population. Similarly impaired mental and psychomotor functions are also association with anaemia. The profound varied effects include delayed physical growth and motor development, general effects on cognitive development resulting in lower intelligence quotient, impairments of memory, less attention span, deficiency in learning and lower educational achievement. There seems to be a vulnerable period for these damages particularly between 9 to 18 months of age. An even more important issue is that as this damage may not always be reversible when iron stores are corrected even in early stage of iron deficiency. Of particulars importance is the effect on central nervous symptoms which leads to defect in cognition and learning process in human, Iron is required for proper myelination of spinal card and white matter of cerebellar folds in brain and is cofactor for a number of enzymes Involved in neurotransmitter synthesis, organogenesis and others. Recent studies have established fact that anaemia in school age children is elated to poor mental capabilities, lower 10., lowered scholastic performance and behavioural modification resulting to pour social interaction and other related problems, *Lazoff* (2002) has reported that iron deficiency adversely affects behaviour fry impairing cognitive development disturbances and by limiting activity and work capacity. It causes alteration in attention process. The behavioural effects of iron deficiency anaemia have been associated with changes in neurotransmission.

RESEARCH DESIGN

The study proceeded with the selection of 300 adolescentgirls among them 100 were non-anaemic (Hb level > 12 gm) and 200 were anaemic (Hi level < 12 gm), aged 13-17 years, by random sampling method. All the subject girls belonged to different schools of Indore city.

Required baseline information was collected from the subjects and from the records of school.

Mental fatigue has been assessed by using mental fatigue sorting chart in terms of letter ticked at Ist min, 5th min, and total and of correct letter identification at during same intervals respectively

A comparative study of the mental fatigue status of anaemic and non-anaemic adolescent girls.

RESULTS AND DISCUSSIONS

Nutrition is one of many factors the affect development of the brain, and therefore, the cognitive development of children investigating the rote that nutrition, plays in cognitive development is likely

to be challenging because nutrition is likely to be an outcome, correlated with internal and external environ mental factors such as demographic, socio-economic, health, social, behavioural and motivational influences. Nutrition is likely to have a number of influences on the development of the brain. So in present study data regarding mental fatigue of the girls was collected and processed.

Obtained results of the present study regarding mental fatigue of the anaemic girls in relation to their hemoglobin status showed agreement with these studies. The table no. 1.1 and 1.2 clearly indicated that in all, the mental fatigue level of the anaemic girls was higher than the non-anaemic girls in terms of correct of letters and no, of mistake made in mental fatigue shorting test. The anaemic group had lower mean no. of letters ticked on 1 min and with higher no. of mistakes done in identification of the right letters ticked which further repeated in the 5 min also. In this way from the results it can be said that anaemia has played some role in mental fatigue level of the girls.

MENTALFATIGUE

Mean no. of letters ticked in 1 min (27.36 and 29.98), correct letters at I min (70.49 and 72.6) and no. of mistake at 1 min (9.62 and 7.77), mean no, of letters ticked in 5 min (34.03 and 29.05% correct letters at 5 min (65.54 and 67.96) and no. of mistake at 5 min (12.75 and 9.99), mean no. of letters ticked totally (142.77 and 157.09) % correct letters totally (68.61 and 68.26) and total no. of mistakes (52.01 and 47.64). By anaemic and non- anaemic girls respectively.

The mental fatigue of the anaemic and non-anaemic adolescent girls shall not be different is accepted for the significant mean value of correct % at I min, correct % at I min. correct % of total no, no. of mistake of total no., and not accepted for no. of letter ticked in 1 min, no. of mistake at I min, no. of letter ticked in 5th min, no. of mixtake at 5th min, total no. of letter ticked

RECOMMENDATIONS

Meanwhile, the feasibility of routine weight and height measurements in schools, including adolescents and younger children, deserves to be examined. BMI nomograms and tables with percentile cut-offs for under, as well as over-weight, as well as appropriate guidelines for their use with adolescents (and younger school-age children), could be useful for schools and health services, while efforts are pursued to develop specific reference data.

Another priority research need is for well-controlled studies on the effects of micronutrient status/supplements on bone mineralization, the timing and magnitude of the growth spurt, and maturation in adolescent boys and girls, in particular vitamin A, calcium, zinc and iron.

It is suggested earlier that adolescents (and schools) were ideal targets for food-based approaches to improve micronutrient status, in particular vitamin A and iron.

The effectiveness of pilot interventions focusing on achievable improvements of micronutrient status through food would urgently need to be evaluated, with considerations of process, cost and sustainability in addition to micronutrient status

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