Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 7, Issue, 04, pp.14234-14236, April, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

STUDY ON DEFICIENCY OF MICRONUTRIENTS LEADING TO OBESITY IN CHILDREN OF JABALPUR CITY

***Jauhari Richa, Pathak Smita and Vaidya Meera**

Department of Food and Nutrition, Govt. M.H. College of Home Science, Jabalpur, M.P., India

ARTICLE INFO

Article History:
Received 30th January, 2015
Received in revised form
19th February, 2015
Accepted 10th March, 2015
Published online 28thApril, 2015

Key words:

Childhood Obesity,
Micronutrients,
Deficiency and Health.

ABSTRACT

Introduction: Childhood obesity is a condition in which body fat has accumulated to the extent that it may have an adverse effect on health leading to various diseases. It was seen that 10% of children and adolescents aged 2-19 years are obese. Micronutrients are commonly referred to as "vitamins and minerals". They are vital to the proper functioning of all our body systems. Micronutrient deficiency can lead to some serious health problems. The obese children with micronutrient deficiencies can suffer from iodine deficiency, vitamin A deficiency, iron deficiency etc.

Objectives: The above study was carried out with the following objectives:

1. To calculate BMI of 7-9 years of children.
2.To check the tiffins of the children.3.To study micronutrient deficiencies in 7-9 years of obese children.

Materials and Methods: The study was carried out in Jabalpur city of Madhya Pradesh. The BMI of children from five affluent schools were calculated and those who had BMI greater than 95th percentile were considered to be obese. Their tiffins were checked out and the nutrients were calculated.

Results: Observations in children from different schools revealed that the mean BMI in 7, 8, 9 years of children was 22.1 ± .92, 21.1 ± .03, 23.1 ± .27 respectively. The mean energy intake of 7 years of children was 713.0 ± 32.10, 8 years was 700.0 ± 29.28, 9 years was 698.36 ± 36.58. The mean protein intake in 7, 8, 9 years of children was 19.3 ± 2.9, 18.6 ± 3.44, 18.8 ± 3.2 respectively. The mean calcium intake in 7 years of children was 94.1 ± 24.9, 8 years was 89.4 ± 23.84, 9 years was 91.7 ± 23.4.The mean iron intake of 7, 8, 9 years of children was 5.27 ± 1.85, 5.00 ± 1.37, 5.07 ± 1.19 respectively. The mean vitamin A intake was found to be 376.39 ± 117.6 in 7 years, 340.82 ± 111.37 in 8 years and 352.46 ± 131.88 in 9 years of children.

Conclusion: Thus, it was found that the children were deficient in calcium, iron and vitamin A which lead them to various nutritional problems like anaemia, goitre, vitamin A deficiency etc. The values of micronutrients were found to be very low when compared with recommended dietary allowances. Hence, the children were advised to include more of calcium, iron and vitamin A rich foods in their diet and for this a standardized booklet consisting of thirty nutritious tiffin recipes was distributed and requested to follow the necessary dietary guidelines. Puppet show, animated movie, leaflet, pamphlet, booklet and poster were also developed to enhance their nutritional knowledge and to improvise the status of their livelihood.

INTRODUCTION

Childhood obesity is a condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health leading to reduced life expectancy and/or increased health problems (WHO, 2000). Overweight and obesity in childhood is associated with serious physiological, psychological and social consequences.

****Corresponding author: Jauhari Richa,***
Department of Food and Nutrition, Govt. M.H. College of Home Science, Jabalpur, M.P., India.

Many of the great consequences manifest during childhood, others later in life. Of great concern is that children who are overweight or obese are also more likely to be overweight or obese as adults (Freedman *et al*., 2005 and Wang *et al*., 2008). Perhaps even more disturbing today's youth may have a shorter like expectancy than their parents because of the high prevalence of obesity (Olshansky *et al*., 2005). The physiological consequences of childhood overweight and obesity are diabetes, atherosclerosis, hypertension, asthma and gall bladder disease etc. The psychological and social consequences of childhood overweight and obesity are depression, anxiety, low self esteem, behavior problems and school absenteeism etc. Almost 12.7 million of children and

adolescents aged 2-19 years are obese. In 2011 – 2012, 8.4% of 2 to 5 years olds were obese as compared with 17.7% of 6 to 11 years olds and 20.5% of 12 to 19 years olds. In 2010, 43 million children were estimated to be overweight and obese, 92 million were at risk of overweight. The worldwide prevalence of childhood obesity increased from 4.2% in 1990 to 6.7% in 2010. This trend is expected to reach 9.1% or 60 million, in 2020. The estimated prevalence of childhood overweight and obesity in Africa in 2010 was 8.5% and is expected to reach 12.7% in 2010 (JAMA). The prevalence is lower in Asia than in Africa, but the number of affected children is higher in Asia. WHO describes obesity as one of the most blatantly visible but most neglected, public health problems that threatens to overwhelm both more and less developed countries. Interest in trace elements has been steadily increasing over the last 25 years. Trace elements are accepted as essential for optimum human health, because of their diverse metabolic characteristics. They serve a variety of catalytic structure and regulatory functions in which they interact with macromolecules such as enzymes, pro -hormones and biological membranes. Micronutrients are nature's wonder drug. And they are remarkably cheap when added for the existing food supply. A comprehensive food fortification program costs just a few cents per year but has a profound impact on blindness, birth defects, mental health and child survival. That's why we focus our efforts on ensuring that every child around the globe has access to fortified food.

When it comes to nutrition, what we may not understand is that micronutrients play an important role in how our body reacts to different types of foods. There have been numerous studies that have shown the correlation that deficiencies in vitamins, minerals and vitamin like substance have been directly linked to weight gain and obesity. The presence of nutritional deficiencies in overweight and obesity may seem paradoxical in light of excess calorie intake, but several micronutrient deficiencies appear to be higher in prevalence in overweight and obese adults and children. Causes are multifactorial and could include decreased consumption of fruits and vegetables, increased intake of high calorie, but nutritionally poor quality foods, and increased adiposity which may influence the storage and availability of some nutrients. Micronutrient deficiencies are affecting us more than we ever thought. The first thought in our minds could be to run to the store and grab a multivitamin, but it is never that simple multivitamins can help us retain some of the micronutrients, but it can never replace the vitamin and minerals that we receive from ingesting, real whole foods .Not only does our body know the difference between these two, but we are also more likely to retain these nutrients within our body with the real deal.

Objectives

The above study was carried out with the following objectives:

1. To calculate Body Mass Index of 7-9 years of children.
2. To analyse the tiffins of the children.
3. To study micronutrient deficiencies in 7-9 years of obese children.

MATERIALS AND METHODS

The study was carried out in Jabalpur city of Madhya Pradesh state. Experimental design of social research was conducted. Five different affluent schools were sorted out and the anthropometric measurement of children belonging to age group 7-9 years were taken. The students who had BMI greater than 95th percentile were considered to be obese. As the children spend one-third of their time in school so the packed lunch must meet one third of their nutritional requirements as recommended by Indian Council of Medical Research according to their age group. Their tiffins were checked out at the three consecutive months and the nutritive value of the packed tiffins and average consumption of three days was calculated.

RESULTS AND DISCUSSION

Observations in children from different schools revealed that the mean BMI in7,8,9 years of children was 22.19 ± 0.92, 21.19 ± .03, 23.13±.27 respectively. The mean energy intake of 7 years of age group of children was 713.05 ±32.10, 8 years was 700.01±29.28, 9 years was 698.36±36.58 respectively which was 6.9%, 5% and 4.7% higher than the R.D.A. values respectively. The mean protein intake in 7,8,9 years of children was 19.3±2.9, 18.6±3.4, 18.8±3.2 which was 41.9%,36.7% and 38.2% higher than the R.D.A. values respectively. The mean calcium intake in 7 years of children was 94.1±24.9,8 years was 89.4 ± 23.8, 9 years was 91.7±23.4 which was 29.4%,32.9 and 31.2% less than the R.D.A. values respectively. The mean iron intake of 7,8,9 years of children was 5.27 ± 1.85, 5.00 ± 1.37, 5.07 ± 1.19 which was 38.7%, 41.8% and 41.0% less than the R.D.A. values respectively. The mean intake of vitamin A was 376.39 ± 117.6, 340.82 ± 111.37, 352.46 ± 131.88 in 7,8,9 years of age group of children which was 52.9%, 57.3%, and 55.9% less than the R.D.A. values respectively.

Table 1. Mean body mass index according to age

Age	N (152)	Mean	S.D +
7	40	22.19	.925
8	57	21.19	.033
9	55	23.13	.272

Table 2. Mean intake of nutrients of tiffins according to age

Energy (kcal)		Protein (gms)		Calcium (mg)		Iron (mg)		Vitamin A (mg)	
R.D.A	Calculated	R.D.A	Calculated	R.D.A	Calculated	R.D.A	Calculated	R.D.A	Calculated
666.6	713.05±32.10	13.6	19.3±2.9	133.3	94.1±24.9	8.6	5.27±1.85	800	376.39±117.6
666.6	700.01±29.28	13.6	18.61±3.4	133.3	89.4±23.8	8.6	5.00±1.37	800	340.82±111.37
666.6	698.36±36.58	13.6	18.8±3.2	133.3	91.7±23.4	8.6	5.07±1.19	800	352.46±131.88

Summary and Conclusion

It was found that the children had deficiency of calcium, iron and vitamin A which lead them to various nutritional problems.

The values of micronutrients were estimated to be very low when compared with Recommended Dietary Allowances. Thus children were advised to include more of calcium, iron and vitamin A rich foods in their diet and for this a standardized booklet consisting of thirty nutritious tiffin recipes which were equicalories and equiproteins was distributed and requested to follow the necessary guidelines. As the children were obese so more stress was laid down to reduce the amount of energy and proteins in their diet. Awareness programmes were organized and puppet show, animated movie, leaflet ,pamphlet ,booklet and poster were also developed to enhance their nutritional knowledge and to improvise the status of their livelihood.

REFERENCES

The World Health Report 2000-Health systems: improving performance.

Freedman, DS. *et al*. 2005. The relation of childhood BMI to adult adiposity, Paediatrics. Jan; 115(1):22-27.

Wang, YC. *et al*. 2012. Reaching the healthy people goals for reducing childhood obesity, *American Journal of Preventive Medicine*; 42(5):437-444.

Olshansky, SJ. *et al*. 2005. A potential decline in life expectancy in the United States in the 21st century; *N Engl J Med*; 352(11):1138-45.

Childhood obesity facts, Prevalence of childhood obesity in the United States, 2011-2012, Centres for disease control and prevention, *Journal of American Medical Association*.

****