WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 5.990
Volume 4, Issue 5, 2228-2234. Research Article ISSN 2277– 7105

ESTIMATION OF ANTIOXIDANTS FROM DIET AND SUPPLEMENTARY DIET

Mrunalini Kanvinde* and Rithika Dante

Lecturer in D.Y. Patil Medical College, Nerul, Navi Mumbai.

Article Received on
13 March 2015,

Revised on 05 April 2015,
Accepted on 28 April 2015

***Correspondence for Author**
Mrunalini Kanvinde
Lecturer in D.Y.Patil Medical College, Nerul, Navi Mumbai.

ABSTRACT

Purpose: Antioxidant is a group of chemical compound that can deactivate free radical. Diets high in vegetables and fruits, which are good sources of antioxidants, have been found to be healthy. Vegetables and fruits are rich sources of antioxidants. People who eat more vegetables and fruits have lower risks of several diseases. So now-a-days it is essential to know about antioxidants. Thus the objective of the study was to determine the cellular antioxidant activity, total phenolic contents, fruits and vegetables commonly consumed in India. **Methods & Materials:** *Data collected consisting of 100 subjects, was done at Nanded through 24 hour dietary recall and questionnaire on dietary supplement used and by taking into consideration there socioeconomic condition and lifestyle. t-* tests and ANOVA were used for doing statistical analysis. Parameters used were age, sex, height, weight. Study was done on the diet to check what they eat. This study included vitamin C, vitamin E, and carotene intakes from diet and dietary supplements to estimate the individual and total antioxidant intakes**. Result:** Energy-adjusted dietary antioxidant intake increased with age ($P < 0.001$), income ($P < 0.01$), and exercise level ($P < 0.05$. Energy-adjusted dietary antioxidant intake was also higher in women than in men ($P < 0.001$). After adjusting for gender, age, ethnicity, BMI, current smoking, and exercise level, fruit and fruit juice consumption was positively associated with dietary and total intake of vitamin C, carotenes, vitamin E, and selenium ($P < 0.05$). Vegetable and vegetable product consumption was positively associated with dietary and total intakes of all individual antioxidants ($P < 0.001$). **Conclusion:** Thus it was concluded that energy-adjusted dietary antioxidant intake is more in males than in females. Are mostly present in fruits and vegetables and are essential to health, which contains antioxidants in the form of Vit.A, Vit. C etc.

KEYWORDS: Antioxidant, diet and dietary supplements, vegetables and fruits.

INTRODUCTION

Antioxidants are man-made or natural substances that may prevent or delay some types of cell damage. Diets high in vegetables and fruits, which are good sources of antioxidants, have been found to be healthy. Antioxidant supplements to be beneficial in preventing diseases. Examples of antioxidants include vitamins C and E, selenium, and carotenoids, such as beta-carotene, lycopene, lutein, and zeaxanthin.

Vegetables and fruits are rich sources of antioxidants. People who eat more vegetables and fruits have lower risks of several diseases. Antioxidant supplements can help prevent chronic diseases, such as cardiovascular diseases, cancer, and cataracts. In most instances, antioxidants did not reduce the risks of developing these diseases.

Antioxidant supplements may interact with some medicines. Antioxidants are man-made or natural substances that may prevent or delay some types of cell damage. Diets high in vegetables and fruits, which are good sources of antioxidants, have been found to be healthy. Some foods are higher in antioxidants than others.

Antioxidant is a group of chemical compound that can deactivate free radical. Can remove / dispose free radicals, which damage body tissue, can harm DNA cell membrane, can cause cancer, inflammation, atherosclerosis. Deficiency can cause a variety of neurological problems with biliary obstruction (common in children).Stimulates immune system. Vitamin A increase susceptibility of lung cancers in smokers. Fruits and vegetables are rich in nutrients called antioxidants that are good for your immune system -- and the rest of you.

METHODS AND METHODS

Study population

Data collection was done at Nanded through 24 hour dietary recall and questionnaire on dietary supplement used. Data collected consisted of 300 subjects from age-group 30years to 60years. There socioeconomic condition and lifestyle was also taken into consideration. Information was taken about persons for seeing whether they were having disease as cardiovascular diseases, diabetes, cancer, neurological disease. Information was taken about persons whether they were smokers or not.

Study protocol

This study included vitamin C, vitamin E, and carotene, intakes from diet and dietary supplements to estimate the individual and total antioxidant intakes. Parameters used were complete blood cell count, age, sex, height, weight. Study was done on the diet to check what they eat.

Measurement of antioxidant activity using biologically relevant assays is important in the screening of fruits for potential health benefits. The cellular antioxidant activity (CAA) assay quantifies antioxidant activity in cell culture and was developed to meet the need for a more biologically representative method than the popular chemistry antioxidant capacity measures. The objective of the study was to determine the cellular antioxidant activity, total phenolic contents, and oxygen radical absorbance capacity (ORAC) values of 25 fruits commonly consumed India.

Food consumption data

Dietary antioxidant vitamin, selenium, and flavonoid intakes were estimated based on one 24-hour *dietary recall* (midnight to midnight). *Dietary recall* data contained all foods and beverages consumed by the respondents except for plain drinking water. To minimize errors from misreporting, individuals with unreliable or incomplete *dietary recall* records were excluded as noted by the National Center for Health Statistics.[6,7]

Estimation of antioxidant intakes from dietary supplement use

The information on dietary supplement use investigators to estimate the individual participant's antioxidant vitamin, selenium intakes from dietary supplements. Dietary supplement data files should consist of 5 files: supplement counts, supplement records, supplement information, ingredient information, and blend information. To calculate the intakes of antioxidant nutrients from the supplement, vitamin C, vitamin E, carotenes, selenium were selected from the ingredient information file. The antioxidant intakes from the supplements were calculated using the supplement counts file, supplement records file, and the nutrient composition table of supplements.[6]

Statistical analyses

We used *t* tests and ANOVA to test for overall differences of antioxidant intakes from diet and supplements by socioeconomic and lifestyle variables such as gender, income, and smoking, etc. The trends of antioxidant intakes by the weight and frequency of specific food

groups consumed were tested using linear contrasts after adjusting for gender, age, ethnicity, BMI, current smoking status, and exercise level. The contribution of each food group to the daily total antioxidant intake was calculated as the ratio of the antioxidant intake from that food group to the total intake from all foods. Values in the text are means ± SD.

RESULT

Table 1- Survey of Antioxidant intake from diet

Vitamin C		Vitamin E		Carotenes		Selenium	
mg/d	*P*-value[2]	*mg/d α-tocopherol*	*P*-value[2]	*µg/d RAE*	*P*-value[2]	*µg/d*	*P*-value[2]
97.2 ± 4.7		7.0 ± 0.1		195.9 ± 11.7		109.4 ± 1.4	
94.0 ± 3.3		7.1 ± 0.2		189.2 ± 9.2		107.7 ± 1.6	
95.5 ± 2.8	<0.001	7.1 ± 0.1	<0.001	192.3 ± 7.4	<0.001	108.5 ± 1.1	0.896
104.6 ± 3.4		8.0 ± 0.1		185.9 ± 8.1		128.5 ± 1.6	
86.6 ± 2.7	<0.001	6.2 ± 0.1	<0.001	198.6 ± 9.8	<0.001	89.2 ± 1.3	<0.001

Thus Energy-adjusted dietary antioxidant intake increased with age (P<0.001), income (P< 0.01), and exercise level (P< 0.05). BMI was positively associated with selenium intake (P< 0.01) but inversely associated with vitamin C (P< 0.01) and E (P< 0.01) intakes. Energy-adjusted dietary antioxidant intake was also higher in women than in men (P < 0.001). Alcohol consumers had lower vitamin C and carotene intakes than non- consumers of alcohol (P < 0.01) and current smokers consumed less vitamin C, vitamin E, and carotenes from diet than nonsmokers (P < 0.05).

Table II - Total antioxidant intakes

Food group	Nonconsumers[2]	T1[3]	T2	T3	*P*-value[4]
Fruit and fruit juices					
Vitamin C,	49.2	67.9	108.9	193.5	<0.00
Vitamin E,	121.0	166.3	237.3	299.4	<0.001
Vegetables and vegetable products					
Vitamin C,	58.0	68.9	86.9	137.5	<0.01
Vitamin E,	4.5	5.6	6.9	9.3	<0.01
Carotenes,	*42.2*	*75.4*	*172.5*	*356.1*	*<0.01*
Vitamin C,	*94.7*	*106.6*	*100.2*	*103.5*	*<0.567*
Vitamin E,	*6.9*	*8.4*	*7.5*	*8.9*	*<0.133*
Carotenes,	*185.9*	*270.1*	*261.8*	*245.1*	*<0.116*
Teas Intake	0	<296	<606.8	<606.8	
Vitamin C,	*96.1*	*93.7*	*98.3*	*89.2*	*<0.422*

Vitamin E,	*7.1*	*6.7*	*6.9*	*7.5*	*< 0.176*
Carotenes,	*181.8*	*229.1*	*211.4*	*236.4*	*<0.132*

Total antioxidant intakes were calculated by summing each participant's antioxidant intake from diet and dietary supplements. Daily total antioxidant intake was 207.9 ± 7.1 mg, vitamin C (46 and 54% from diets and supplements, respectively), 19.8 ± 0.7 mg carotenes (86 and 14%), and 122.3 ± 1.2 μg

The impact of the consumption of specific food groups or foods on individual antioxidant intakes was investigated by testing the linear tends in individual dietary and total antioxidant intakes by the consumption of specific food groups, such as fruits and fruit juices, vegetables and vegetable products, wines, and teas. After adjusting for gender, age, ethnicity, BMI, current smoking, and exercise level, fruit and fruit juice consumption was positively associated with dietary and total intake of vitamin C, carotenes, vitamin E, and selenium ($P < 0.05$). Vegetable and vegetable product consumption was positively associated with dietary and total intakes of all individual antioxidants ($P < 0.001$).

DISCUSSION

Now-a-day supplements are a major source for vitamin C intake. The mean daily intake of dietary vitamin C should be in the range from 80.1 mg to 200.8 mg. Vitamin E intake was significantly higher in nonsmokers (7.2 mg) than in smokers (6.9 mg). In our study, smokers consumed less vitamin C, vitamin E, and carotenes than nonsmokers. This is consistent with previous findings. Nevertheless, it raises a serious public health concern, because smokers are exposed to increased oxidative stress and have a higher demand for antioxidant vitamins than nonsmokers.

Energy-adjusted antioxidant intake from supplement was higher in women, older adults. They found women; participants with high levels of education, low BMI, and active lifestyles; and nonsmokers take more supplements than their counterparts.

We found that consumption of fruits; fruit juices, vegetables, and wine were positively associated with dietary and total antioxidant intake. Fruit, fruit juices, and vegetables have previously been identified as major sources of antioxidant vitamins.[9,10]

It has previously been reported that supplement users have a higher intake of micronutrients from food, including vitamin C, vitamin E, and carotenoids, independent of antioxidant

intake from supplements.[10] We identified the major food sources of dietary vitamin C is citrus fruit juice, fruits, potatoes, tomatoes, and other vegetables.[8]

The leading sources of vitamin C diet as fruits and fruit juices, vegetables, and vitamin C-fortified fruit drinks. Major food sources of dietary vitamin E were vegetable oils (sunflower and olive), noncitrus fruits, nuts, and seeds.[1]

Our study found deep-yellow vegetables, dark green vegetables, and other vegetables were the major food source of carotenes. The antioxidant mineral selenium was mainly consumed in yeast breads, grains, meat, poultry, fish, and eggs by. Onion is the major source of flavonoids in the[8,9] diets. In adults, red wine was a major catechin and epicatechin source, whereas in children it was apples, apricots, and grapes.

However, despite within-person variability, a 24-h DR can produce adequate estimates of mean intake of a group that can be useful for contrasting the dietary status of the group with different levels of risk factors for certain diseases.[4]

In summary, the results of this study demonstrated that daily antioxidant intakes from diet and dietary supplements are significantly different in adult subgroups having different lifestyle behaviors. In this study, we focused on the documentation of the antioxidant intake levels based on food composition tables; thus, further research is needed to study individual bioavailability, metabolism in the human body, and changes during processing and food preparation.[10] Estimated total antioxidant intake from both diets and supplement is a prerequisite to investigating the implicated relation between the antioxidant intake and the prevalence of chronic diseases within a population and its subgroups. Having a reliable and valid assessment of dietary intake is the first step to establishing recommended dietary intakes that promote public health. The findings of this study will play a pivotal role in promoting and protecting national health through concerted efforts of policymakers, public health officers, nutrition and health educators in the government, the food and supplement industry, and academia.[12]

ACKNOWLEDGEMENTS

I am grateful to my mother Anjali, husband Rajendra, daughter Vaishnavi and my friends for the prestigious help in writing this paper.

REFERENCES

1. Steffen LM; Associations of whole-grain, refined-grain, and fruit and vegetable 2. Record IR; Changes in plasma antioxidant_status following consumption of diets high or low in fruit and vegetables Or following dietary supplementation with an antioxidant mixture. Br J_Nutr., 2001; 85: 459–64.
2. Chun OK, Kim D-O; Daily consumption of phenolics and total antioxidant capacity from fruit and vegetables in the American diet. J Sci Food Agric., 2005; 85: 1715–24.
3. Frei B; Cardiovascular disease and nutrient antioxidants: role of low density lipoprotein oxidation; Crit Rev Food Sci Nutr., 1995; 35: 83–98.
4. Kris-Etherton PM; Bioactive compounds in foods: their role in the prevention of cardiovascular disease and cancer; Am J Med., 2002; 113: S71–88.
5. Hyattsvilles; National Center for Health Statistics. National Health and Nutrition Examination Survey, 1999–2000 Data Files. CDC., 2002.
6. Botman S; Design and estimation for the national health interview survey, 1995–2004. National Center for Health Statistics. Vital Health Stat., 2000; 2(130).
7. Institute of Medicine. Dietary reference intakes for vitamin C, vitamin E, selenium, and carotenoids. Washington, DC: National Academies Press., 2000.
8. Institute of Medicine. Recommended dietary allowances. 10th Ed. Washington, DC: National Academies Press., 1989.
9. Pomerleau J; The challenge of measuring global fruit and vegetable intake. J Nutr., 2004; 134: 1175–80.
10. Phillips EL; Differences and trends in antioxidant dietary intake in smokers and non-smokers, 1980–1992: the Minnesota Heart Survey;Ann Epidemiol., 2000; 10: 417–23.
11. Estimation from of antioxidant intakes diets and supplements sources in the U.S. population, J. Nutr., 2010; 140: 17–324.