

Relationship of reported oral symptoms and signs versus daily vitamin E consumption

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Vitamin E is known to be an essential nutrient in more than twenty vertebrate species, including man.¹ While the story is still incomplete, vitamin E clearly exerts its effects upon the hematopoietic, muscular, vascular, and central nervous systems. Hence, it is reasonable to assume that this fat-soluble vitamin should also influence the oral tissues.

In 1968 the Food and Nutrition Board of the National Research Council¹ suggested a recommended dietary allowance of 30 and 25 units per day for the male and female, respectively. Parenthetic mention should be made that these standards are intended for a reference man living in the United States under usual environmental stresses.

The purpose of this report is threefold: (1) to determine in broad terms the daily intake of vitamin E in a group of presumably healthy subjects; (2) to ascertain the frequency of suboptimal intake; and (3) to analyze the relationship of vitamin E consumption to reported oral findings.

METHOD OF INVESTIGATION

One hundred eight presumably healthy members of the Southern California Academy of Nutritional Research (mostly dental practitioners and their wives) participated in this experiment. The age and sex distribution is summarized in Table I. Each subject completed the Oral Health Index Questionnaire.² This is a self-administered form which includes, among its 150 present history questions, fifty questions relating to present oral symptoms and signs. The number of positive replies is multiplied by two, giving an index ranging from zero (the ultimate in oral health) to 100 (an oral cripple). The number so derived is called the present oral index (PRESOREX). The PRESOREX distribution for the group is outlined in Table II. Each subject also completed a brief dietary

Table I. Age and sex distribution

<i>Age groups</i>	<i>Male group</i>	<i>Female group</i>	<i>Total group</i>
10 to 19	1	2	3 [1.1%]
20 to 29	2	6	8 [7.8%]
30 to 39	16	14	30 [39.3%]
40 to 49	22	10	32 [35.6%]
50 to 59	16	8	24 [11.9%]
60 to 69	5	2	7 [3.0%]
70 to 79	2	2	4 [1.5%]
Totals	64	44	108 [100.0%]*
Mean	45.9	41.0	43.9
S.D.	11.4	14.0	12.7
Minimum	15	10	10
Maximum	76	79	79
Range	61	69	69

*Approximate.

Table II. Present oral index (PRESOREX) distribution

<i>Presorex groups</i>	<i>Number of subjects</i>	<i>Percentage of subjects</i>
0	3	2.8
1 to 9	57	52.8
10 to 19	37	34.3
20 to 29	10	9.3
30 to 39	1	0.9
Total	108	100.0*
Mean		9.9
S.D.		6.7
Minimum		0
Maximum		32
Range		32

*Approximate.

Table III. Daily vitamin E consumption (dietronic analysis)

<i>Vitamin E (I.U.)</i>	<i>Male group</i>	<i>Female group</i>	<i>Total group</i>
5.0 to 14.9	22 [34.4%]	13 [29.5%]	35 [32.4%]
15.0 to 24.9	23 [35.9%]	23 [52.3%]	46 [42.6%]
25.0 to 29.9	10 [15.6%]	4 [9.1%]	14 [13.0%]
30.0 to 34.9	3 [4.7%]	2 [4.5%]	5 [4.6%]
35.0+	6 [9.4%]	2 [4.5%]	8 [7.4%]
Total	64 [100.0%]	44 [100.0%]*	108 [100.0%]
Mean	21.0	19.1	20.2
S.D.	10.5	8.6	9.8
Minimum	5.9	6.8	5.9
Maximum	56.1	45.3	56.1
Range	50.2	38.5	50.2

*Approximate.

record, using the Dietronic Analysis System.⁹ The daily vitamin E intake was calculated and is summarized in Table III.

RESULTS

Question 1

Table III summarizes the daily vitamin E consumption for the group. It is clear that, for the entire group, there is considerable variation, ranging from 5.9 to 50.2 units, a tenfold difference. Second, the largest segment is consuming in the range of 15 to 25 units daily. Finally, the spread is much less in the female group. *Hence, in answer to the first question, vitamin E consumption varies widely in this relatively healthy sample.*

Question 2

If one accepts the newly developed recommended dietary allowances, then one must grant that 85.9 and 81.8 per cent of males and females show suboptimal intake. *Thus, with regard to the second question, the majority of these presumably well subjects are consuming inadequate amounts of vitamin E.*

Question 3

To develop Table IV, the group of 108 subjects was divided into two equal subgroups of fifty-four persons each in terms of higher and lower vitamin E

Table IV. Relationship of present oral index (PRESOREX) and daily vitamin E consumption (dietronic analysis)

Age groups	Daily vitamin E intake			
	5.9 to 19.0 units	19.1 to 50.2 units	Total	
10 to 43	[23]* 9.6 ± 7.0	[32] 9.4 ± 5.9	[55]	9.5 ± 6.3
44 to 79	[31] 12.6 ± 8.2	[22] 7.2 ± 3.7	[53]	10.4 ± 7.2
Total	[54] 11.3 ± 7.8	[54] 8.5 ± 5.2	[108]	9.9 ± 6.7

*Sample size.

Table V. Statistical analysis

Groups	t	P
Younger age group, lower versus higher vitamin E intake	0.073	> 0.500
Older age group, lower versus higher vitamin E intake	3.277	< 0.005*
Lower vitamin E group, younger versus older age groups	1.450	> 0.100
Higher vitamin E group, younger versus older age groups	1.726	> 0.050
Younger versus older age group	0.679	> 0.400
Lower versus higher vitamin E group	2.207	< 0.050*

*Statistically significant difference.

consumption. Thus, there are fifty-four persons reporting an intake of 5.9 to 19.0 units, while the other fifty-four have a range of 19.1 to 50.2 units per day. On a mean basis, the PRESOREX appears different (11.3 ± 7.8 versus 8.5 ± 5.2). The statistical significance of this difference is heightened by a $t = 2.207$ and a $P < 0.05$ (Table V). *Therefore, as far as the total sample is concerned, oral complaints (PRESOREX) are significantly higher in those consuming less than the recommended dietary allowance of vitamin E.*

Parenthetic mention should be made that statistically significantly higher PRESOREX scores were also noted in the older group consuming the lower versus the higher quantity of vitamin E (Table V).

SUMMARY

In terms of the recommended dietary allowance of vitamin E, more than 75 per cent of this professional group (dentists and wives) fall short. The present oral health status (as derived from the Oral Health Index Questionnaire) of those consuming the suboptimal quantity of vitamin E as judged by dietronic analysis is significantly worse.

REFERENCES

1. Food and Nutrition Board, National Research Council: Recommended Dietary Allowances, ed. 7, Washington, 1968, National Academy of Sciences.
2. Oral Health Index Questionnaire, Costarex, Inc., 1616 Central Ave., St. Petersburg, Fla.
3. Dietronics, Electronic Diet Analysis, Hanson Research Corporation, Van Nuys, Calif.