

## **Effect of Vitamin and Trace-Element Supplementation on Immune Responses and Infection in Elderly Subjects**

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### FROM ABSTRACT

Ageing is associated with impaired immune responses and increased infection-related morbidity. This study assessed the effect of physiological amounts of vitamins and trace elements on immuno-competence and occurrence of infection-related illness. 96 healthy elderly individuals were randomly assigned to receive nutrient supplementation or placebo. Nutrient status and immunological variables were assessed at baseline and at 12 months, and the frequency of illness due to infection was ascertained. Subjects in the supplement group had higher numbers of certain T-cells and natural killer cells, enhanced proliferation responses to mitogen, increased interleukin-2 production, and higher antibody response and natural killer cell activity. These subjects were less likely than those in the placebo group to have illness due to infections (23 vs. 48 days per year). Supplementation with a modest physiological amount of micronutrients improves immunity and decreases the risk of infection in old age.

### THIS AUTHOR ALSO NOTES:

"Aging is generally associated with impaired immune responses and increased frequency of infection (especially respiratory disease), which is a major cause of illness and the fourth commonest cause of death in elderly people."

"However, at least 25% of old individuals have immune responses as vigorous as those of young adults." "Nutrition is an important determinant of immuno-competence."

"Supplementation with selected nutrients may improve certain aspects of the immune system."

This study is a double-blind placebo-controlled trial using 96 men and women over age 65 years, who were randomly assigned to receive either daily placebo or a nutrient supplement. The subjects were followed for 12 months.

The supplement contained:

|               |                 |
|---------------|-----------------|
| Retinol       | 400 equivalents |
| Beta-carotene | 16 mg.          |
| Thiamin       | 2.2 mg.         |
| Riboflavin    | 1.5 mg.         |
| Niacin        | 16 mg.          |
| B-6           | 3 mg.           |
| Folate        | 400 mcg.        |
| B-12          | 4 mcg.          |
| Vitamin C     | 80 mg.          |
| Vitamin D     | 4 mcg.          |
| Vitamin E     | 44 mg.          |
| Iron          | 16 mg.          |
| Zinc          | 14 mg.          |
| Copper        | 1.4 mg.         |
| Selenium      | 20 mcg.         |
| Iodine        | 0.2 mg          |
| Calcium       | 200 mg.         |
| Magnesium     | 100 mg.         |

During the study, subjects who became ill were diagnosed using clinical features, lab tests, blood work, radiographs of chest or sinuses, cultures of sputum-urine-blood, C-reactive protein, and erythrocyte sedimentation rate.

## RESULTS

- "Infection-related illness was much less frequent in the supplemented group than in the placebo group (23 vs. 48 days per year)." [Very Important]
- "The predominant beneficial effect of supplementation on cell-mediated immune responses in the elderly is similar to that recorded in younger subjects." [Important]
- "Supplementation with modest physiological amounts of essential vitamins and trace elements resulted in a significant improvement in immuno-competence."

"It is important to note that large-dose supplements were not used."

"The results of this study substantiate the hypothesis that nutritional status is an important determinant of immuno-competence in old age and that an optimal intake of micronutrients is needed for enhanced immune responses in elderly subjects."

Supplementation of these elderly subjects "led to a striking reduction in illness, a finding that is of considerable clinical and public-health importance."

## KEY POINTS:

- 1) Ageing is associated with impaired immune responses and increased infection-related morbidity.
- 2) This study shows that healthy elderly subjects who take a modest daily vitamin-mineral supplement reduce their rates of infections by more than 50%.
- 3) Supplementation with a modest physiological amount of micronutrients improves immunity and decreases the risk of infection in old age.
- 4) Supplementation is also beneficial for the immune responses in younger subjects. [Important]
- 5) "Aging is generally associated with impaired immune responses and increased frequency of infection (especially respiratory disease), which is a major cause of illness and the fourth commonest cause of death in elderly people."
- 6) "At least 25% of old individuals have immune responses as vigorous as those of young adults." [Very Important]
- 7) "Nutrition is an important determinant of immuno-competence."
- 8) "Supplementation with modest physiological amounts of essential vitamins and trace elements resulted in a significant improvement in immuno-competence."
- 9) "The results of this study substantiate the hypothesis that nutritional status is an important determinant of immuno-competence in old age and that an optimal intake of micronutrients is needed for enhanced immune responses in elderly subjects."
- 10) Supplementation of these elderly subjects "led to a striking reduction in illness, a finding that is of considerable clinical and public-health importance."