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#### **Research:**

#### **Selenium Levels in Nails of Premenopausal Breast Cancer Patients Assessed Prediagnostically in a Cohort-Nested Case-Referent Study among Women Screened in the DOM Project**

PA H VAN NOORD, H J A COLLETTE, M J MAAS  
and F DE WAARD 1987 **Oxford University Press**

Selenium has been claimed to have chemo-preventive properties. However, data showing that in humans selenium levels are already decreased prior to diagnosis of breast cancer were not available. Such information is mandatory before oral selenium supplementation in the primary prevention of (breast) cancer in humans is acceptable. This question of a 'preventive-potential' of selenium was evaluated in a case-control study nested in a cohort, because this design allows determination of the time-order of preceding selenium levels and subsequent cancer risk.

The cohort consisted of 5577 women aged 55–70 years from the DOM project, a population based breast cancer screening program in the Netherlands. Instrumental Neutron Activation Analysis was used to measure the selenium content of toenail clippings. The 69 cases of breast cancer found during follow-up after screening represent 'recent' tumours since all women had a negative screening mammogram 3–5 years previously.

No decreased selenium levels, as measured in nail clippings from the big toes, could be detected in cases-to-be, either when compared to 4 age matched controls per case or when compared with a random control group drawn from the entire cohort. On the contrary, a tendency for slightly higher selenium levels among 'future' cancer cases was observed.

As to the sensitivity of detecting differences in selenium by nail clippings, lower selenium could be detected in nails of current smokers. The smoking-related decrease in the nail selenium level was of the same order as the differences between breast cancer cases and controls, but was independent of the breast cancer risk.

#### **Nail calcium and magnesium content in relation to age and bone mineral density.**

Ohgitani S, Fujita T, Fujii Y, Hayashi C, Nishio H. J Bone Miner Metab. 2005;23(4):318-22.

In view of the importance of calcium (Ca) and magnesium (Mg) as major bone components and nutrients controlling bone metabolism, and the ready availability of nail samples for analysis, clippings of fingernails and toenails were analyzed for Ca and Mg. The clippings were dissolved in nitric acid and analysis was done, using atomic absorption spectrophotometry, in 169 women and 115 men between 20 and 80 years of age. Fingernail Ca concentration in men decreased from 927 +/- 50 ppm (mean +/- SEM) in their twenties to 464 +/- 50 ppm in their eighties, with a significant negative correlation with age ( $r = -0.322$ ;  $P < 0.0001$ ) and such a negative correlation was also shown in the women ( $r = -0.269$ ;  $P = 0.0004$ ). Toenail Ca concentrations also decreased significantly with age in men ( $r = -0.534$ ;  $P < 0.0001$ ) and women ( $r = -0.224$ ;  $P = 0.0016$ ). Fingernail Mg concentration, in contrast, increased significantly with age in both men ( $r = 0.209$ ;  $P = 0.0145$ ) and women ( $r = 0.280$ ;  $P < 0.0001$ ), but toenail Mg failed to show significant changes with age in either men or women. Multiple stepwise regression analysis of age and lumbar bone mineral density (LBMD) on fingernail Ca concentration eliminated age before LBMD. In a separate group of 33 women in their sixties, a significant positive correlation was noted between fingernail Ca and LBMD ( $r = 0.544$ ;  $P = 0.0016$ ) and between toenail Ca and LBMD ( $r = 0.399$ ;  $P = 0.0215$ ). A negative correlation was also noted between fingernail Mg concentration and LBMD ( $r = -0.389$ ;  $P = 0.0252$ ). Nail mineral content may be utilized as one of the indicators of bone mineral metabolism.

#### **PREDICTORS OF SELENIUM CONCENTRATION IN HUMAN TOENAILS**

D. J. HUNTER, J. S. MORRIS, C. G. CHUTE,, E. KUSHNER, G. A. COLDITZ, M. J. STAMPFER, F. E. SPEIZER and W. C. WILLETT. American Journal of Epidemiology Vol. 132, No. 1:114-122

To assess the validity of the selenium concentration in human toenails as a measure of selenium intake, and to determine other correlations of toenail selenium levels, the authors examined the predictors of toenail selenium within two subgroups of a large cohort study of US women. Mean toenail selenium was higher among 38 consumers of selenium supplements (0.904 µg/g,

*(Continued on page 166)*