We conclude that serum selenium is unlikely to be overall associated with breast cancer risk. We could not find any modifying effects from smoking or BMI. The present study was the largest prospective studies on serum selenium and breast cancer risk when it was published and adds to the evidence that selenium is not likely to have a protective effect regarding breast cancer risk as previous research has been unconclusive about.

**Background**

The essential mineral selenium (Se) has been proposed to have a protective effect regarding breast cancer risk, but previous research has not been conclusive. Se is used as a building block in a group of proteins with various function, including two of the bodies main intracellular anti-oxidation proteins Glutathione Peroxidase and Thioreductin reductase. This study was conducted to clarify if there is an association between prediagnostic serum Se levels and breast cancer risk.

**Discussion**

Many of the previous studies that suggests an increased risk of breast cancer amongst women with low Se are case-controls studies. Evidence points towards that Se levels drops after diagnosis which might be the reason why the prospective studies, including our own, can’t find any association with low Se and breast cancer while the non-prospective studies do. With that in mind as well as the clear null results in our study it is unlikely that Se has any overall protective effect regarding risk of breast cancer.

Our pre-specified hypothesis was that smoking and/or BMI could have a modifying effect since both those factors lowers the serum Se. However, the sub-group-analysis of smokers and women with BMI>25 showed no significant differences between breast cancer risk and serum Se either.

**Method**

A prospective nested case-control design was used within the Malmö Diet and Cancer cohort. A total of 1186 women with breast cancer diagnosed after baseline and an equal number healthy controls were included. Serum Se was analysed from stored samples taken at baseline. The women were divided into quartiles based on serum Se values. Logistic regression was used to calculate odds ratio and the analyses were adjusted for relevant breast cancer risk factors. We also stratified the analyses for BMI and smoking.

**Result**

There were no overall association between serum Se and breast cancer. This was seen both when comparing the quartiles and when selenium was analysed as a continuous variable with an odds ratio of 1.00 and a 95% confidence interval of 1.00-1.01. Crude and adjusted analyses were similar.