Proceedings of the Nutrition Society (2023), **82 (OCE5)**, E369 doi:10.1017/S0029665123004688

Summer Conference 2023, 3–6 July 2023, Nutrition at key stages of the lifecycle

The association between selenium status and musculoskeletal function in very old adults: The Newcastle 85+ Study

G. Perri[1,5], J.C. Mathers[1,5], C. Martin-Ruiz[2], J. S. Walsh[3,5], R. Eastell[3], L. Schomburg[4], L. Robinson[1], T. Chillon[4], K. Demircan[4], C. Parker[2] and T. R. Hill[1]

[1]*Human Nutrition and Exercise Research Centre, Population Health Sciences Institute, Faculty of Medical Sciences, Newcastle University, Newcastle upon Tyne, UK,*

[2]*BioScreening Core Facility, Campus for Ageing and Vitality, Newcastle University, Newcastle upon Tyne,*

[3]*Department of Oncology and Metabolism, University of Sheffield, Sheffield, UK,*

[4]*Institute for Experimental Endocrinology, Charité-Universitätsmedizin Berlin, Berlin, Germany and*

[5]*MRC-Versus Arthritis Centre for Integrated research into Musculoskeletal Ageing (CIMA), Human Nutrition and Exercise Research Centre, Population Health Sciences Institute, Faculty of Medical Sciences, Newcastle University, Newcastle upon Tyne, UK*

Limited data from cross-sectional studies shows that selenium status is positively associated with musculoskeletal (MSK) function in adults[1,2]. However, these associations have not been investigated in a prospective study design and in very old adults. The aims of the study were to examine the relationships between the biomarkers of selenium status and MSK function and disability among participants in The Newcastle 85+ Study at baseline and prospectively up to 5 years.

Biomarkers of selenium status (serum selenium, glutathione peroxidase (GPx3) and selenoprotein P (SePP)) at baseline were measured in 757 participants from The Newcastle 85+ Study. Hand grip strength (HGS) was measured using a hand dynamometer, Timed Up and Go (TUG) was determined as the time to rise from a chair, walk 3 m and return, and sarcopenia prevalence was determined according to EWGSOP cut-offs[3]. Disability was measured using a self-reported questionnaire focusing on the ability to perform 17 activities of daily living. The relationships between the biomarkers of selenium status and MSK function (HGS, TUG, sarcopenia and disability) were analysed at baseline using linear regression and over 5 years follow-up using linear mixed models adjusting for covariates.

At baseline, in adjusted models, there was no association between biomarkers of selenium status and HGS or TUG. However, there were negative associations between selenium biomarkers and disability; serum selenium (β -0.014 ± 0.06, P = 0.019); and SePP (β -0.15 ± 0.07 P = 0.038). GPx3 activity at baseline was negatively associated with change in prevalence of sarcopenia (β 8.44^{E-4} ± 3.88^{E-4}, P = 0.030) after a 3-year follow-up.

In cross-sectional analysis, selenium status was associated with a lower risk of disability and over time, GPx3 activity was negatively associated with sarcopenia prevalence.

Acknowledgments

We thank the operational support from the North of England Commissioning Support Unit and the local general practitioners and staff in addition to the research, management and administrative teams and the study participants and their families for providing the data. We would also like to thank the research team at Charité Berlin and selenOmed GmbH, namely, Dr. Petra Seemann and Qian Sun, Julian Hackler and Sophie Jahn for support in analysing the biomarkers of selenium status.

References

1. Lauretani F, Semba, RD, Bandinelli S, Ray AL *et al.* (2007) *Am J Clin Nutr* **86**, 347–52.
2. Beck J, Ferrucci L, Sun K *et al.* (2007) *BioFactors* **29**, 37–44.
3. Cruz-Jentoft A (2019) *Age and Ageing* **48**, 16–31.