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Trace mineral status in Caucasian and South Asian postmenopausal women living in the UK

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Zinc, Selenium and Copper are essential trace minerals that are important for human health and data suggests there is a high prevalence of inadequate intake in the UK with the prevalence of inadequate intake being higher in females than in males⁽¹⁾. Previous data from this laboratory has also indicated that South Asian (SA) females may be more at risk of micronutrient deficiency than Caucasian (C) females⁽²⁾. The aim of this study was to investigate this further and conduct a comparative investigation of Zn, Se and Cu status in postmenopausal SA and C females. Apparently healthy postmenopausal C and SA females of 50–65 years of age and at least one year post menopause were identified for this study. Dietary information was collected using an interviewer administered food frequency questionnaire (FFQ)⁽³⁾ which was developed to study nutrient intakes of an adult Pakistani, European and African-Caribbean community in inner city Britain. Fasting blood samples were collected and plasma was stored at -70°C until analysis. The Se, Cu, and Zn content of plasma samples was measured by inductively coupled plasma-mass spectroscopy (ICP-MS).

	Caucasian (Mean)	SD	South Asian (Mean)	SD
Age (y)	60.04	4.3	56.31	3.5
Zn Intake (mg/d)	10.19	2.5	8.52*	3.1
Cu Intake (mg/d)	2.32	1.5	1.16*	0.3
Se Intake ($\mu\text{g}/\text{d}$)	66.53	4.7	40.45*	2.5
Zn Intake (mg/kJ)	1.087	0.2	1.073	0.3
Cu Intake (mg/kJ)	0.242	0.11	0.148*	0.03
Se Intake ($\mu\text{g}/\text{kJ}$)	6.964	2.7	5.118*	1.7
Plasma Zn ($\mu\text{mol}/\text{L}$)	11.03	3.5	9.46	3.4
Plasma Cu ($\mu\text{mol}/\text{L}$)	14.06	2.6	15.73*	3.4
Plasma Se ($\mu\text{mol}/\text{L}$)	0.96	0.2	0.87*	0.2

Mean values were significantly different from Caucasian: * $p < 0.05$.

Results indicate that dietary intake of Zn, Se, and Cu was significantly lower in the SA compared with the C females ($p < 0.05$). Significant differences between the two populations were also identified for both Se and Cu when mineral intake was normalised to energy intake ($p < 0.05$). When dietary intake levels were compared to the current UK dietary reference values the SA population were found to have an intake of Se that was significantly lower than the DRV (60 $\mu\text{g}/\text{d}$; $p < 0.05$). Differences between the two populations were also identified for plasma Se and Cu; plasma Se was significantly lower and plasma Cu was significantly higher in the SA compared to the C females ($p < 0.05$). In contrast to the dietary intake data where Zn intake was higher than the DRV plasma Zn fell below the reference range of 12–25 $\mu\text{mol}/\text{L}$ in both the SA and C females. In conclusion trace mineral analysis of dietary intake and plasma levels revealed differences for Se, Cu and Zn in SA and C females. Only Se intake in the SA females was a significantly below the DRV and plasma Zn levels indicate a marginal deficiency in both populations.

1. Vinas BR, Barba LR, Ngo J *et al.* (2011) *Ann Nutr Metab* **59**, 84–95.
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3. Vyas A, Greenhalgh A, Cade J *et al.* (2003) *J Hum Nutr Dietet* **16**, 327–337.