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“Association of vegetable nitrate intake with carotid
atherosclerosis and ischemic cerebrovascular disease in older
women”**

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**Response by Bondonno, Blekkenhorst and Hodgson to Letter Regarding Article,
“Association of vegetable nitrate intake with carotid atherosclerosis and ischemic
cerebrovascular disease in older women”**

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In response:

We thank Dr Kazushi Tsuda for his interest in our study reporting the association of vegetable nitrate intake with carotid atherosclerosis and ischemic cerebrovascular disease in older women ¹. We read, with great interest, that an increase in carotid atherosclerosis might be associated with reduced membrane fluidity of red blood cells (RBCs), leading to reduced microcirculation ² and that reduced membrane fluidity of RBCs is associated with lower levels of plasma nitrate and nitrite ³. Unfortunately we do not have data on the levels of plasma nitrate and nitrite for this cohort of older women. However, in a randomised controlled study in healthy women, we have previously observed a linear dose-response for nitrate intake on both plasma nitrate and nitrite concentrations ⁴. With a nitrate dose of 0 mg we observed plasma nitrate levels (mean; 95% CI) of 33; 22-40 $\mu\text{mol/L}$ and plasma nitrite levels (mean; 95% CI) of 59; 42-72 nmol/L . With a nitrate dose of 100 mg (similar to the mean nitrate intake from vegetables observed in our cohort of older women of 67 ± 29 mg/d) we observed plasma nitrate levels (mean; 95% CI) of 79; 47-102 $\mu\text{mol/L}$ and plasma nitrite levels (mean; 95% CI) of 89; 63-110 nmol/L . Increases in plasma nitrate and nitrite after dietary nitrate intake have also been observed in numerous other studies across a range of nitrate intakes ⁵. We agree with Dr Tsuda that it is important to “assess more precisely the relationship between inorganic nitrate intake and changes in microcirculation and their contribution to the protection against the progression of carotid artery atherosclerosis” and that design of future studies in this area should include these parameters.

DISCLOSURES

None

REFERENCES

1. Bondonno CP, Blekkenhorst LC, Prince RL, Ivey KL, Lewis JR, Devine A, et al. Association of vegetable nitrate intake with carotid atherosclerosis and ischemic cerebrovascular disease in older women. *Stroke*. 2017;STROKEAHA. 117.016844
2. Tsuda K. Independent association between carotid artery atherosclerosis and membrane microviscosity of red blood cells in hypertensive subjects-an electron spin resonance study. *Circ J*. 2015;79(Suppl I):I-949(abstract)
3. Tsuda K, Kinoshita-Shimamoto Y, Kimura K, Nishio I. Nitric oxide is a determinant of membrane fluidity of erythrocytes in postmenopausal women: An electron paramagnetic resonance investigation. *American journal of hypertension*. 2003;16:244-248
4. Bondonno CP, Croft KD, Puddey IB, Considine MJ, Yang X, Ward NC, et al. Nitrate causes a dose-dependent augmentation of nitric oxide status in healthy women. *Food Funct*. 2012;3:522-527
5. Bondonno CP, Croft KD, Ward NC, Considine MJ, Hodgson JM. Dietary flavonoids and nitrate: Effects on nitric oxide and vascular function. *Nutr Rev*. 2014;73:216-235