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Association between carrot intake and cancer risk in a prospective observational study of >85-year-olds does not deviate from other age groups

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Carrot consumption reduces tumour development in several animal models, possibly as sources of polyacetylenes, resistant starch, carotenes or other active constituents. In a recent systematic review and meta-analysis of prospective studies[(1)], we showed that carrot intake measured directly or using α-carotene as a marker of carrot intake was associated with reduced risk of cancer incidence. However, since the incidence of cancers among very old people (aged 85 and over) is lower than in those aged 65 to 85[(2)], it is of interest to understand how carrot intake affects cancer risk across different age groups. Here we compare the results from the Newcastle 85+ study[3] and a meta-analysis of prospective studies[1] of older adults aged 65-85 years at baseline.

In the Newcastle 85+ study[(3)] (n = 387, 65% women), baseline dietary carrot intake was assessed using a multiple-pass recall tool (2×24 h recalls) and α-carotene concentration measured in plasma samples by reverse phase high-performance liquid chromatography. Cancer incidence data were ascertained from medical records, and the association between carrot intake and α-carotene and cancer risk (any type) tested using multivariable Cox proportional hazard regression models. For the meta-analysis[(1)], mean ± SD of the reported upper age range at baseline in 50 studies (with 52000 cases) with data on carrot intake reported directly or indirectly (as α-carotene intake) was 68 ± 12 years, and in 30 studies (9331 cases) reporting plasma concentration of α-carotene it was 69 ± 9 years.

In the Newcastle 85+ study, the summary risk ratio (RR) for cancer incidence was 0.82 (95% CI: 0.24 – 2.79, n = 129 cases, 258 non-cases) for consumption of ≥ 1 vs < 1 serving/day of carrots after adjusting for key confounders. RR for cancer for the highest compared with lowest quartile of plasma α-carotene was 0.68 (0.33 –1.39). The corresponding values comparing highest versus lowest exposure groups for the younger age groups in the meta-analysis[(1)] were: RRs (95% CI) for carrot intake 0·90 (0·87–0·94) and 0·80 (0·72–0·89) for plasma α-carotene. For most (67 of 80) of the individual studies included in the meta-analysis, the RRs were not statistically significantly different from 1, as was the case for the Newcastle 85+ study, due to small sample size and limited duration of the dietary records. However, the similarity of the RR values from the Newcastle 85+ study with the two corresponding independent datasets in the meta-analysis means that the results do not support a difference in effect between the age groups.

The association of carrot consumption with incident cancer in the very old does not differ from younger age groups of older adults. Carrot consumption should be encouraged among the very old, and the causal mechanisms further investigated.

References

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