Re: Cancer as a Risk Factor for Long-Term Cognitive Deficits and Dementia

The recent report linking cancer as a risk factor for cognitive dysfunction at a statistically significant level and dementia at a non–statistically significant level (1) is interesting and highlights the possible risk of unwanted side effects from cancer treatment. However, the link between cancer and cognitive dysfunction is likely due to shared risk factors as well. The study overlooked the role of dietary and lifestyle factors (e.g., exercise, smoking) in modifying the risks of both cancer and dementia among the elderly.

Although genetics plays an important role in the etiology of cognitive dysfunction and dementia (1), so do diet and lifestyle (2–5). Furthermore, Japanese Americans and African Americans living in the United States have a two and four times greater risk, respectively, of Alzheimer disease than when living in their ancestral homelands, which is statistically correlated with national consumer dietary supply factors in linear regression analyses with $r^2$ values ranging from 0.69 to 0.93 (2). Total energy and fat intake are directly associated with risk of Alzheimer disease, whereas fish and cereals/grains intake are inversely associated (2).

Cancer risk is also strongly linked to dietary and lifestyle factors [including smoking (6,7)]. Intake of animal products that are high in both fat and protein is associated with risk for many common cancers, such as breast and colon cancer (6). The mechanisms may include production of insulin-like growth factor I (IGF-I) (6) and endogenous sex hormones. A recent review highlighted the Western high-fat and refined-sugar diet and physical inactivity as important risk factors for cancer (7). Thus, cancer and dementia share several dietary and lifestyle risk factors.

In conclusion, recent findings indicate that contributions to cognitive dysfunction and dementia from both diet and lifestyle may occur prior to the development of cancer and its treatment. Further studies are required to determine the relative contributions from each.

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REFERENCES


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Grant points out that cancer and dementia share several dietary and lifestyle risk factors. Although the analyses reported in our recent article (1) did not control for possible shared risk factors such as high-fat diets because we used a co-twin control design and twins tend to be similar in their eating and other habits, there was considerable control for diet and other lifestyle factors built into the design itself. Further, there is reason to believe that diet alone cannot account for the association between cancer and cognitive dysfunction. The most convincing studies in this respect are those that randomly assigned patients to receive different cancer treatments and found poorer cognitive performance among those randomized to some treatments than that found with other treatments; for example, to high-dose versus standard-dose chemotherapy (2) or to chemotherapy versus radiation (3). It seems unlikely that dietary and lifestyle covariates could be fully responsible for the adverse cognitive effects that were observed in these studies. It also seems improbable that the experience of “chemobrain” that patients report following their cancer treatment (4) is an effect of diet rather than a side effect of chemotherapy. In short, it seems likely that a major explanation for cognitive sequelae of cancer is cancer treatment.

We agree that there is provocative overlap in some of the potentially protective dietary factors that have been recommended in relation to cancer and to dementia, e.g., low fat (except for omega-3 fatty acids) and high intake of dark-skinned fruits and vegetables (5). We also note that in a recent survival analysis, Roe et al. (6) report that people with Alzheimer disease have a slower rate of subsequently developing cancer than a nondemented group; this finding raises more unresolved questions. Clearly, research is needed to understand the multiple mechanisms that are likely to play a role in the link between cancer and its treatments and later cognitive dysfunction, as we have noted previously (1).

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