Spouses of Cancer Patients Have an Increased Risk of Cardiovascular Disease: What Do We Know About This Link?

Running title: Schneiderman et al.; Cancer Caregivers and CVD

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Key words: editorial; cancer; coronary heart disease; stroke; caregiver; spouse
The article by Ji, Zöller, Sundquist and Sundquist found that after a cancer diagnosis in husbands or wives, the risks of coronary heart disease (CHD), ischemic and hemorrhagic stroke, were each significantly increased in affected versus non-affected spouses\(^1\). This analysis used several Swedish national data registries, including the Swedish Cancer Registry, the Swedish National Population and Housing Census, and the Swedish Multi-Generation Registry, which cover close to 100 percent of the population and include substantial individual-level information. Such a comprehensive and integrative system made it possible systematically and objectively to assess the association between being a cancer caregiver and the elevation in the risk of cardiovascular disease. Thus, the study found that the spousal caregivers of cancer patients compared to a matched reference group, experienced an increase in the risk of CHD and stroke of 13-29% when assessed for up to 20 years after their spouse’s cancer diagnosis.

An important contribution provided by Ji and colleagues in their analysis is that they were able to provide insight into the relative contribution to increased cardiovascular risk attributable to pre-existing lifestyle factors versus possible stress-related psychosocial variables affecting the spousal-caregiver following the diagnosis of cancer\(^1\). However, the extent to which the stress of caregiving leads directly to physiological dysregulation as opposed to adverse effects manifested by post-diagnosis changes in lifestyle in the caregiver, could not be evaluated by Ji and colleagues.

Because the risk of CHD and stroke were examined for the period preceding the diagnosis of cancer to evaluate possible associations with lifestyle factors shared by spouses, Ji and collaborators were able to assess the extent to which the increased cardiovascular risk that they observed following the diagnosis of cancer in a spouse could be related to shared habits, such as smoking and high alcohol consumption, as opposed to psychological distress related to care-
giving and/or changes in life circumstances\textsuperscript{1}. An elevated risk for men, for example, was noted before the diagnosis of certain site-specific cancers in their wives, including stomach, liver, pancreatic and lung cancers. This suggests that at least some of the elevated risk in the spouses of cancer patients may have been related to unhealthy lifestyle behaviors, such as smoking, diet and alcohol use. Thus, similar lifestyles shared by spouses may have contributed to the pathogenesis of both cancer and cardiovascular disease. Previous studies have shown increased risk from cigarette smoking, alcohol and obesity both for cancer\textsuperscript{2-4} and for cardiovascular disease\textsuperscript{5-7}.

Shared lifestyle factors, however, do not seem to account for much of the increase in cardiovascular disease experienced post-diagnosis for cancer by spousal caregivers when compared to a matched reference group. Ji and colleagues observed that prior to the diagnosis of cancer, overall risks were slightly higher (i.e., 3-5\%) in the husbands but lower in the wives compared with their reference groups, suggesting that the relatively larger post-diagnosis increases in cardiovascular risk experienced by spousal caregivers were probably not substantially related to shared lifestyle factors\textsuperscript{1}.

Instead, the findings reported by Ji and colleagues suggest that factors associated with psychological distress may have been responsible for the increase in cardiovascular events that occurred in the caregivers of cancer patients following diagnosis\textsuperscript{1}. It has long been known that caregivers of sick patients report elevated psychological distress that is significantly greater than in non-caregivers\textsuperscript{8-10}. Although distress peaks around the time of diagnosis and treatment and subsides during the years afterward, psychological distress is a prevalent concern among cancer caregivers throughout the illness trajectory\textsuperscript{11}. Chronic distress may elevate cardiovascular risk by augmenting sympathetic nervous system activity leading to increases in blood pressure and
arrhythmias as well as through adverse effects involving hemostasis and inflammation\textsuperscript{12}.

Depression as a consequence of chronic distress has been associated with the caregiving of sick patients\textsuperscript{13} and has also been implicated as an independent predictor of CHD\textsuperscript{14,15}. Dysregulation of the autonomic nervous system has been implicated in the depression-cardiovascular disease risk relationship\textsuperscript{16}. Specifically, however, the behavioral and biological pathways between psychosocial distress and the pathogenesis of cardiovascular disease in the caregivers of cancer patients are not known with certainty, but warrant further attention.

Another area of need in terms of caregiving research is in relation to non-spousal caregivers, such as adult children and other close relatives. A survey conducted by the National Alliance for Caregiving reported that roughly 86\% of all adult caregivers in the United States are relatives, with 44\% caring for a parent or parent-in-law and only six percent caring for a spouse or partner\textsuperscript{17}. This reflects current social trends of our aging population and changes in the composition of caregivers. Unique pressures are put onto adult offspring caregivers—the so-called “sandwich generation”—who are often employed and caring for children of their own in addition to caring for a parent who is a cancer patient. This combination adds other stressors and role obligations that can increase subjective burden\textsuperscript{18}. Since cancer is a common disease among elders\textsuperscript{19}, and the ages and health status among caregivers are becoming more diverse, our understanding of the relationships between caregiving stress and the pathogenesis of cardiovascular disease is likely to become more complex. Whereas the median age of caregivers at the time of diagnosis in the study by Ji and colleagues was 66 years in men and 67 years in women\textsuperscript{1}, following younger caregivers may require a longer follow-up period, as the manifestations of cardiovascular disease associated with the caregiving experience may require a longer period of observation.
The findings of increased risk of CHD and stroke among spousal caregivers of cancer patients by Ji and colleagues, demonstrate the importance of having comprehensive national registries that can document important health problems\(^1\). These impressive findings additionally suggest the need for a comprehensive multi-center case-control study to assess endophenotypes as well as how lifestyle and distress pathways link cancer caregiving to increased cardiovascular disease. A better, more complete understanding of these pathways would in turn help to identify appropriate treatments that could decrease caretaker risks of cardiovascular disease.

**Conflict of Interest Disclosures:** None

**References:**


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Circulation. published online March 13, 2012;
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

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