

Coffee Consumption Associated with Increased Mortality of Women with Breast Cancer

Steven Lehrer, Sheryl Green, and Kenneth E. Rosenzweig

Background: There has been some speculation that caffeine consumption may affect breast cancer. Most case-control studies have not documented evidence of a caffeine-breast cancer incidence link; however, there has been very little analysis of the possible effects of caffeine consumption on breast cancer survival.

Methods: We examined overall a 20-year survival of 96 women treated for breast cancer between 1990 and 1994. As part of their health history, these women were asked about coffee drinking.

Results: Fifty-three women drank one cup a day (79.2% survival), 22 women had two cups a day (72.7% survival), and 21 women drank three or more cups a day (42.9% survival). The effect of coffee consumption on survival was significant ($p=0.006$, the log rank test). To exclude the effects of lymph node involvement, age at diagnosis, and smoking history, Cox regression was performed. The effect of coffee was significant ($p=0.001$), independent of the effects of lymph node involvement ($p=0.012$) and age at diagnosis ($p=0.014$), and unrelated to a smoking history ($p=0.721$).

Conclusion: Fatigued breast cancer survivors have an abnormal proinflammatory cytokine activity, an average of 5 years after diagnosis, as well as significant serum cortisol derangements compared to other survivors. One possible interpretation of our results suggests that there is an abnormal hypothalamic-pituitary-adrenal axis functioning in breast cancer patients with persistent fatigue, who might be using coffee to self-medicate. In other words, coffee consumption in the present study might be a surrogate marker for fatigue. Because of the paucity of data regarding caffeine intake, poor sleep, fatigue, and breast cancer survival, further studies could be worthwhile.

Introduction

FAGHERAZZI *ET AL.* RECENTLY REPORTED no association between coffee, tea, or caffeine consumption and breast cancer risk in a prospective cohort study,¹ although there has been some speculation that caffeine may affect breast cancer. Indeed, one study reported that women with benign breast disease experienced relief from symptoms after eliminating caffeine from their diet. However, most case-control studies have not documented evidence of a caffeine-breast cancer incidence link. In prospective studies, no increase in breast cancer risk has been noted, with one study suggesting a weak, but significant, inverse association between caffeine consumption and breast cancer risk.² Moreover, no evidence for an association between tea consumption and risk of breast cancer has been seen.^{3,4}

However, there has been very little analysis of a possible relationship of coffee consumption with breast cancer survival. We describe here survival of women treated for breast cancer who reported coffee consumption.

Methods

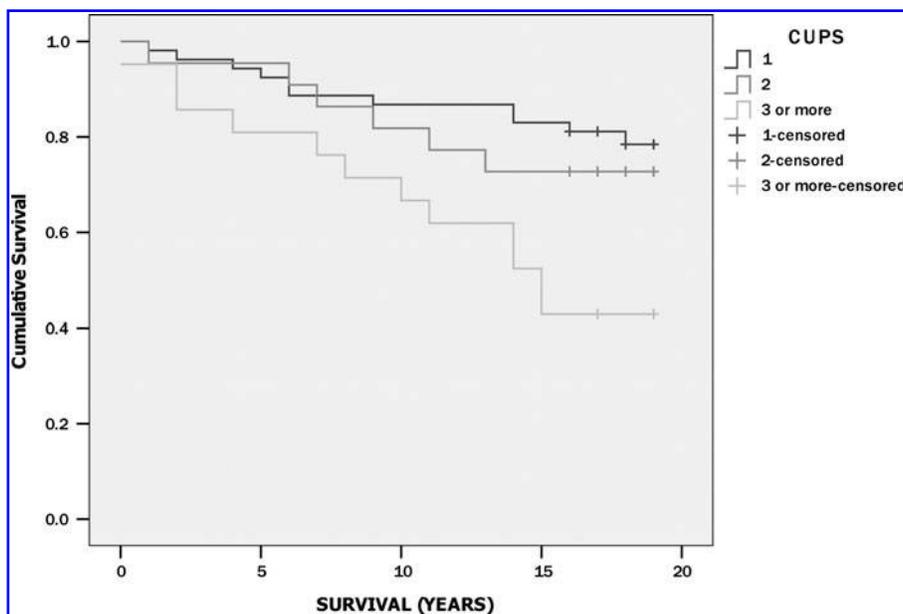
We examined a 20-year survival of 96 women treated for invasive breast cancer at the Mount Sinai Medical Center between 1990 and 1994. The age at diagnosis was 53 ± 16 (mean \pm SD). As part of their health history, these women were asked about coffee drinking. Coffee consumption of the subjects was measured in cups per day. No other sources of caffeine were included in the questionnaire (such as cola).

This study was approved by the Ethics Committee of the Mount Sinai Medical Center and written informed consent was obtained from all the participants. The investigation has been conducted according to the principles expressed in the Declaration of Helsinki.

Results

The cumulative 20-year survival of all 96 women was 69.8%, which is comparable to the 64% for England and Wales.⁵ Fifty-three women drank one cup a day (79.2% survival), 22 women had two cups a day (72.7% survival), and

FIG. 1. Cumulative overall survival (years) of 96 women with breast cancer stratified by coffee consumption (cups per day). 53 women drank one cup a day (79.2% survival), 22 women had two cups a day (72.7% survival), and 21 women drank three or more cups a day (42.9% survival). The effect of coffee consumption on survival was significant ($p=0.006$, the log rank test).



21 women drank three or more cups a day (42.9% survival). The effect of coffee consumption on survival was significant ($p=0.006$, the log rank test, Fig. 1).

To exclude the effects of node involvement, age at diagnosis, and smoking history, Cox regression was performed. The effect of coffee was significant ($p=0.001$), independent of the effects of lymph node involvement ($p=0.012$) and age at diagnosis ($p=0.014$), and unrelated to smoking history ($p=0.721$).

Discussion

Approximately one third of breast cancer survivors report marked fatigue, along with significantly higher levels of depression, pain, and sleep disturbance. Fatigued survivors are more bothered by menopausal symptoms and are more likely to have received chemotherapy (with or without radiation therapy) than nonfatigued survivors. In multivariate analyses, depression and pain are the strongest predictors of fatigue.⁶

Fatigued breast cancer survivors have an abnormal pro-inflammatory cytokine activity, an average of 5 years after diagnosis, as well as significant serum cortisol derangements compared to other survivors.^{7,8} One possible interpretation of our results suggests that there is an abnormal hypothalamic-pituitary-adrenal axis functioning in breast cancer patients with persistent fatigue,⁹ who might be using coffee to self-medicate. In other words, coffee consumption in the present study might be a surrogate marker for fatigue.

Previous studies of coffee consumption show no relationship with overall cancer mortality¹⁰ or all-cause mortality.^{11,12} Weak positive correlations were reported between incidence ($r=0.42$) and mortality ($r=0.37$) from breast cancer and coffee consumption in a geographical study.¹³ Phelps and Phelps² conducted an ecological study, which did not distinguish between tea and coffee consumption, and reported that 85% of the international variation in breast cancer incidence is associated with variations in fat intake. When fat intake is accounted for, the partial correlation of breast cancer incidence rates with caffeine intake is negative ($p=0.05$). How-

ever, Phelps and Phelps did not evaluate breast cancer mortality.

Because of the paucity of data regarding caffeine intake, poor sleep, fatigue, and breast cancer mortality, further studies could be worthwhile.

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Author Disclosure Statement

No competing financial interests exist.

References

- Fagherazzi G, Touillaud MS, Boutron-Ruault MC, Clavel-Chapelon F, Romieu I. No association between coffee, tea or caffeine consumption and breast cancer risk in a prospective cohort study. *Public Health Nutr.* 2011;5:1–6.
- Phelps HM, Phelps CE. Caffeine ingestion and breast cancer. A negative correlation. *Cancer.* 1988;61:1051–1054.
- Willett WC. Diet and breast cancer. *J Intern Med.* 2001;249:395–411.
- Boggs DA, Palmer JR, Stampfer MJ, Spiegelman D, Adams-Campbell LL, Rosenberg L. Tea and coffee intake in relation to risk of breast cancer in the Black Women's Health Study. *Cancer Causes Control.* 2010;21:1941–1948.
- Woods LM, Rachet B, Cooper N, Coleman MP. Predicted trends in long-term breast cancer survival in England and Wales. *Br J Cancer.* 2007;96:1135–1138.
- Bower JE, Ganz PA, Desmond KA, Rowland JH, Meyerowitz BE, Belin TR. Fatigue in breast cancer survivors: occurrence, correlates, and impact on quality of life. *J Clin Oncol.* 2000;18:743.
- Bower JE, Ganz PA, Aziz N, Fahey JL. Fatigue and pro-inflammatory cytokine activity in breast cancer survivors. *Psychosomat Med.* 2002;64:604.
- Collado-Hidalgo A, Bower JE, Ganz PA, Cole SW, Irwin MR. Inflammatory biomarkers for persistent fatigue in breast cancer survivors. *Clin Cancer Res.* 2006;12:2759.

9. Bower JE, Ganz PA, Dickerson SS, Petersen L, Aziz N, Fahey JL. Diurnal cortisol rhythm and fatigue in breast cancer survivors. *Psychoneuroendocrinology*. 2005;30:92–100.
10. Freedman ND, Park Y, Abnet CC, Hollenbeck AR, Sinha R. Association of coffee drinking with total and cause-specific mortality. *N Engl J Med*. 2012;366:1891–1904.
11. Lopez-Garcia E, van Dam RM, Li TY, Rodriguez-Artalejo F, Hu FB. The relationship of coffee consumption with mortality. *Ann Intern Med*. 2008;148:904–914.
12. Tamakoshi A, Lin Y, Kawado M, Yagyu K, Kikuchi S, Iso H. Effect of coffee consumption on all-cause and total cancer mortality: findings from the JACC study. *Eur J Epidemiol*. 2011;26:285–293.
13. Armstrong B, Doll R. Environmental factors and cancer incidence and mortality in different countries, with special reference to dietary practices. *Int J Cancer*. 1975;15:617–631.

Address correspondence to:
Steven Lehrer, MD
Department of Radiation Oncology
Mount Sinai Medical Center
Box 1236
New York, NY 10029
E-mail: stevenlehrer@hotmail.com