"Influence of Body Mass Index and Other Characteristics on Outcomes After Treatment for Early Stage Colon Cancer"

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ABSTRACT

Colon cancer is the fourth most commonly diagnosed cancer and the second leading cause of cancer deaths in the United States. Although the risk of developing colon cancer has often been associated with obesity, the relationship between obesity and outcomes after surgery and treatment for colon cancer has not been well understood. In this study, we analyze overall survival (OS) and other outcomes among 4310 colon cancer patients who participated in randomized clinical trials of the National Surgical Adjuvant Breast and Bowel Project, using Body Mass Index (BMI, kg/m^2) as a measure of obesity. Survival analysis and competing risks methods were used to evaluate the events constituting one of the trial endpoints, disease-free survival (DFS), specifically the cause-specific hazards rate and cumulative incidence of 1) colon cancer recurrence; 2) development of second primary cancers at other sites; and 3) death prior to either of the above events. The Kaplan-Meier estimator was used to estimate OS and DFS. The Cox proportional hazard model was used to assess the prognostic influence of BMI and other patient and disease characteristic on DFS event and OS hazards. Goodness of fit and model assumptions were validated for the final models.

We found that, adjusting for all other recorded patient/disease characteristics, compared with normal weight patients (BMI 18.5-24.9 kg/m^2), the obese II/III group (BMI ≥35.0 kg/m^2) has a significantly higher hazard of experiencing colon cancer recurrence and borderline significantly higher hazard of non-cancer deaths, leading to poorer DFS for obese II/III class patients. These patients also experience significantly worse OS. Similarly, the under-weight group (BMI <18.5 kg/m^2) has significantly greater non-cancer death rate and occurrence of second cancer of other types, and thus lower disease-free survival rate and worse OS. Neither overweight (BMI 25.0-29.9 kg/m^2) nor obese I (BMI 30.0-34.9kg/m^2) groups differ significantly from the normal weight group in hazard for any of the endpoints. In addition, many disease/symptomatic characteristics also increase the probability of colon cancer recurrence and decrease DFS and OS rates. Females have significantly lower mortality than males, as do whites relative to blacks. Furthermore, black males are significantly more likely to develop second primary cancer than white males, while among females, whites have higher second cancer risk.