ELSEVIER

Urologic Oncology: Seminars and Original Investigations 37 (2019) 357–358

UROLOGIC ONCOLOGY

Seminars article

Urological cancers and lifestyle: Nudging patients toward healthy behaviors

J. Kellogg Parsons, M.D., M.H.S.*

Division of Urologic Oncology, Moores Comprehensive Cancer Center, UC San Diego Health System, La Jolla, CA

Received 10 March 2018; received in revised form 14 December 2018; accepted 5 January 2019

Abstract

Prevention of incident and progressive cancer diminishes health care costs and reduces treatment-associated morbidities. This Seminar series of *Urologic Oncology* explores one potential method of cancer prevention and treatment: lifestyle modification. In general, lifestyle recommendations for prostate, bladder, and kidney cancer mirror those for cardiovascular and global health: increased vegetable and fruit intakes; decreased red meat, saturated fat, and refined carbohydrate intakes; increased physical activity; smoking avoidance or cessation; and moderation of alcohol intake. The challenge lies in the design of actionable behavior-based therapies, which should minimize economic burdens for patients, promote standardized treatments, deliver efficient care to relatively large patient populations, and engage stakeholders.

Keywords: Diet; Prevention; Cancer; Kidney cancer; Prostate cancer; Bladder cancer; Exercise; Physical activity; Fat; Vegetables; Carbohydrates; Smoking; Tobacco

Prevention of incident and progressive cancer diminishes health care costs and reduces treatment-associated morbidities. This *Seminar series* of *Urologic Oncology* explores one potential—and understudied—method of cancer prevention and treatment: Lifestyle modification.

Preclinical and observational data suggest that diet, exercise, and other modifiable behaviors substantially influence the risks of urological cancer incidence, progression, metastases, and death. In general, lifestyle recommendations for prostate, bladder, and kidney cancer mirror those for cardiovascular and global health: Increased vegetable and fruit intakes, decreased red meat, saturated fat, and refined carbohydrate intakes; increased physical activity, smoking avoidance or cessation, and moderation of alcohol intake.

Kwan and colleagues discuss behavioral and nutritional factors in the prevention and treatment of bladder cancer, including total fluid intake, tea consumption, vegetable and fruit consumption, physical activity, and smoking. They conclude that while overall data on diet are mixed, strong associations of smoking with bladder cancer incidence and progression, coupled with a current lack of clinician engagement with tobacco cessation counseling, provide an opportunity for improvement in patient care delivery. They also note that well-designed prospective studies are needed to further elucidate this topic, and describe a large, prospective cohort study—the Bladder Cancer Epidemiology, Wellness, and Lifestyle Study (Be-Well Study)—examining the role of nutritional, lifestyle, and genetic factors in bladder cancer treatment and outcomes.

Lin and colleagues review the effects of nutrition and diet on the incidence and progression of prostate cancer. They note that while epidemiological and clinical data are mixed, maintaining a healthy body weight and following a healthy dietary pattern (increased servings of antioxidant-rich fruits and vegetables and reduced servings of animal fat and refined carbohydrates) should be encouraged with prostate cancer patients. They assert that soy protein, ω3 fat, green teas, tomatoes and tomato products, the herbal mixture zyflamend, and reduced carbohydrate diets have shown promise in reducing incident and progressive prostate cancer; and review the concept of a "U"-shaped risk curve in which the benefits of a

*Corresponding author. Tel.: (858) 822-6187.
E-mail address: jkparsons@ucsd.edu

https://doi.org/10.1016/j.urolonc.2019.01.008
1078-1439/

healthy exposure accumulate with increasing dosages until an inflection point after which increased dosages may potentially lead to harmful outcomes. They describe U-shaped risk associations of folate, vitamin C, vitamin D, and calcium with prostate cancer.

Finally, using data from the Prostate, Lung, Colorectal, and Ovarian Cancer (PLCO) Screening Trial and other studies, Liss and colleagues examine associations of modifiable lifestyle factors with kidney cancer. They review metabolic factors, including higher body mass index (BMI), and behaviors such as smoking that are potentially associated with increased risk of renal cell carcinoma. While definitive evidence of causality with kidney cancer incidence and progression is lacking for these factors, the authors identify weight loss and smoking cessation as 2 potential clinical interventions that merit further prospective study in this patient population.

A theme common to all 3 articles is the need for scientifically rigorous, hypothesis driven trials. The clinical implementation of lifestyle focused treatments for urological cancers will require the development of feasible and efficacious therapies that engage patients, providers, and payers. Behavior modification may be one such therapy. Behavior modification interventions, grounded in well-established principles of social science, "nudge" patients toward beneficial behaviors including healthy eating, exercise, weight loss, and smoking cessation.

In 2018, the first large-scale, randomized clinical trial (RCT) of a behavioral intervention for a urological cancer successfully completed. The Men's Eating and Living (MEAL) Study (CALGB 70807 [Alliance]) was a Phase III trial of prostate cancer patients on active surveillance. From 2011 to 2015, 478 (103%) of a targeted 464 patients were randomized (1:1) at 91 sites in the United States to a validated telephone-based diet counseling intervention promoting vegetable intake or to a control condition for 2 years. The primary endpoint was time to clinical progression. Secondary endpoints included the incidence of definitive treatment for prostate cancer and health-related quality of life metrics [1].

Compared to control, the MEAL intervention significantly increased from baseline—and sustained through 24-month follow-up—total vegetable ($P \leq 0.001$), crucifer ($P \leq 0.001$), total carotenoid ($P \leq 0.001$), and lycopene ($P \leq 0.001$) intakes. At 24-month, there were no differences between the intervention and control groups for Kaplan Meier progression-free rates (43.5% [36.5%, 50.6%] vs. 41.4% (34.3%, 48.7%]) or TTP (adjusted hazards ratio 0.98 [95% confidence interval: 0.76, 1.26, *P value* = 0.76]. Nevertheless, as the first RCT to test the effect of a dietary intervention in prostate cancer survivors, the MEAL study demonstrates that scalable, robust behavior modification is feasible in patients with urological cancers [2].

These data identify important and underappreciated scientific opportunities. The challenge lies in the design of actionable behavior-based therapies. Successful urological interventions for the modifiable lifestyle factors outlined in these reviews should minimize economic burdens and practical barriers to care for patients, promote intervention fidelity through standardized treatment protocols, deliver efficient care to relatively large patient populations, and engage stakeholders.

References

[1] Parsons JK, Pierce JP, Mohler J, et al. Men's Eating and Living (MEAL) study (CALGB 70807 [Alliance]): recruitment feasibility and baseline demographics of a randomized trial of diet in men on active surveillance for prostate cancer. BJU Int 2018;121:534–9.

[2] Parsons JK, Zahrieh DM, Pierce JP, et al. The Men's Eating and Living (MEAL) Study (CALGB 70807 [Alliance]): a randomized clinical trial of a diet intervention in men on active surveillance for prostate cancer. J Urol 2018;199:e1077.