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Review Article

Adverse Health Outcomes Associated with Postdiagnosis Smoking in Prostate Cancer Patients: A Literature Review

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ABSTRACT

This literature review presents what is currently known about the association between postdiagnosis smoking and adverse health outcomes in prostate cancer. A literature search was conducted using Ovid Embase and Ovid MEDLINE. Information from 36 studies was summarized. There is strong evidence across the included studies of higher overall mortality and biochemical recurrence in current smokers diagnosed with prostate cancer. In addition, enhanced adverse effects following surgery, radiation, and hormone therapy have also been identified in current smokers of this population.

Keywords: Smoking cessation; Quality of life; Cancer treatment

RÉSUMÉ

Cette revue de littérature présente la somme de connaissances actuelle sur l'association entre l'usage du tabac après un diagnostic de cancer de la prostate et les effets nocifs sur la santé. L'étude a été réalisée à partir des bases de données Ovid EMBASE et Ovid MEDLINE. Des renseignements provenant de 36 études ont été résumés. Les études examinées montrent une forte évidence de mortalité plus élevée et de récurrence biochimique chez les fumeurs ayant reçu un diagnostic de cancer de la prostate. De plus, des effets secondaires plus marqués après la chirurgie, la radiothérapie et l'hormonothérapie ont également été observés chez les fumeurs actuels au sein de cette population.

Introduction

Prostate cancer (PC) follows respiratory illnesses as a leading cause of death related to smoking [1]. After lung cancer, PC is the second most commonly diagnosed cancer reported in men worldwide [2].

Growing clinical evidence of the associations between postdiagnosis smoking and adverse health outcomes (eg, mortality, second malignancy, ICU admission) makes for a case in favor of the integration of smoking cessation as an element in cancer care planning [3–6]. Smoking is also associated with poor quality of life (QOL) and adverse effects in treatment [4, 7–10]. A review and meta-analysis conducted with a focus on the PC patient population demonstrated a significant impact of smoking on survival [11].

It has been more than two decades since the release of the Surgeon General's Report on the Health Benefits of Smoking Cessation in 1990 [12]. However, it has been estimated that more than half of smokers upon diagnosis continue to smoke throughout their treatment, putting them at a risk of decreased treatment efficacy, survival, and QOL [13]. Despite this and the accumulation of evidence since on its benefit, smoking cessation remains a common unmet need in PC patients [14].

This literature review will look at the adverse health outcomes associated with postdiagnosis smoking in the PC patient population.

Methods

Searches were conducted by V.G. in November 2016 using Ovid Embase and Ovid MEDLINE. Keywords used included “prostate,” “cancer,” “carcinoma,” “smoking,” “tobacco,” “recurrence,” “survival,” “metastasis,” “mortality,” “morbidity,” “second primary,” “treatment outcome,” and

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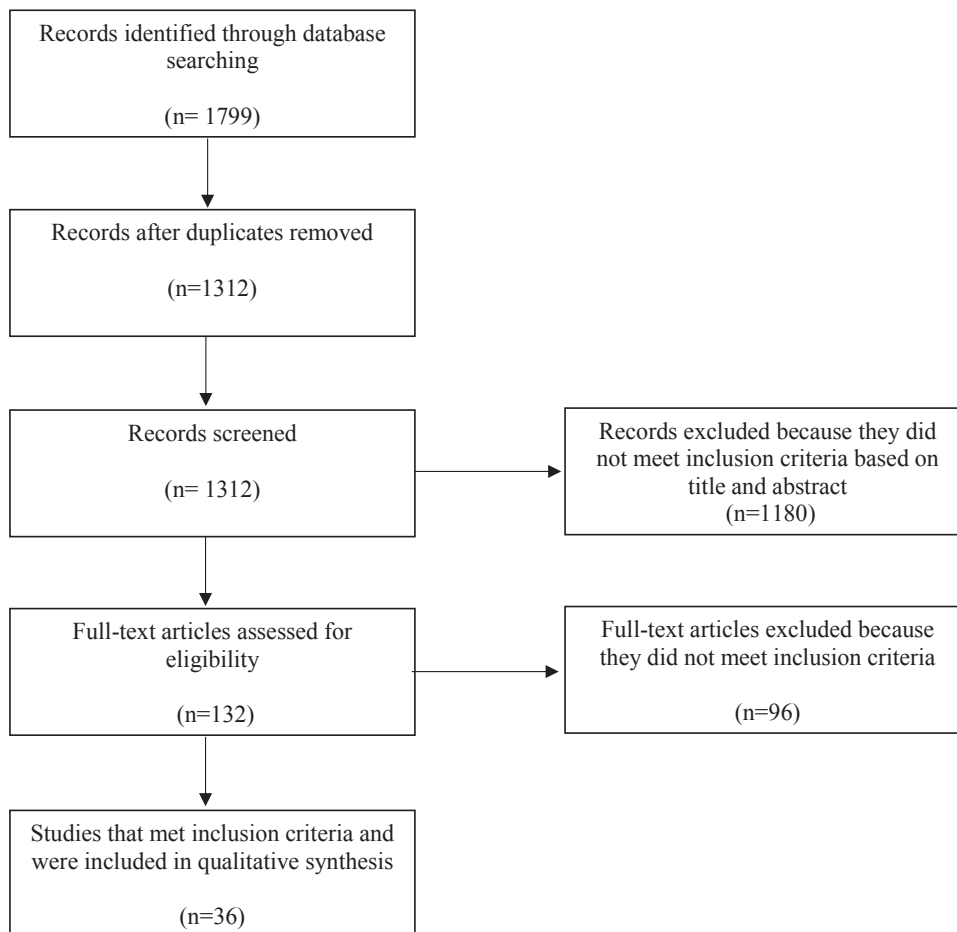


Figure 1. Flowchart of literature search and article evaluation process.

“adverse effects.” Original observational studies (prospective or retrospective; cohort, cross-sectional, or case-control) discussing health outcomes associated with “current” or postdiagnosis smoking in patients undergoing surgical resection, chemotherapy, hormone therapy, or radiation treatment for PC were included. Studies reporting differences in health outcomes between current and former and/or never smokers in patients diagnosed with PC were included. Publication year was limited to 1990–2016. Non-English, animal studies, and abstracts were excluded.

Results

The literature search and article evaluation process are represented in Figure 1. The literature search yielded a total of 1,799 articles. After removal of duplicates, 1,312 articles remained. After the initial title and abstract screening, a total of 132 full papers were screened by V.G. and P.Z. A total of 36 observational studies were included in the review and are summarized in Table 1.

In terms of study design, 11(31%) were prospective and 25(69%) were retrospective. Out of the 36 studies, 26 (72%) discussed disease-related outcomes (eg, survival, recurrence, metastases), and 11 (31%) reported treatment-related outcomes (eg, adverse effects, second malignancies).

Disease-Specific Outcomes

In our results, we found all significant increases in cardiovascular-specific mortality in current smokers compared to never smokers [17, 25]. Current smoking was also found to be significantly associated with increased overall or all-cause mortality [25, 29, 30, 32, 35, 36, 45, 46, 49, 50]. To a lesser degree, significant increases were also observed in PC-specific mortality [20, 22, 36, 43]. Current smoking was also found to be associated with decreased progression-free survival or increased incidence of biochemical recurrence and metastases [24, 25, 29, 31–33, 35, 38, 43].

In a prospective observational study, Kenfield et al [25] demonstrated that current smokers had an increased risk of biochemical recurrence (hazard ratio [HR] = 1.61, 95% confidence interval [CI] 1.16–2.22), all-cause mortality (HR = 2.01, 95% CI 1.64–2.47), and cardiovascular-specific mortality (HR = 1.98, 95% CI 1.29–3.04). It is hypothesized that higher rates of adverse health outcomes in current smokers may be attributed to unfavorable clinic-pathologic features. However, increased risk of biochemical recurrence persisted in their analysis after adjusting for clinical stage and disease. Cessation of 10 years or greater was associated with decrease in PC-specific mortality, resembling the level of risk in those who never smoked. In a retrospective

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