

Commentary

Smoking Cessation Tools in the Urological Context: Considering the Genitourinary Impacts of Smoking Cessation Tools

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Abstract: Electronic cigarette use is rising globally. Although it may represent a potential smoking cessation tool, amidst misinformation and social media promotion, there is a growing concern regarding the health risks associated with its usage. These risks include adverse effects on the genitourinary system. This commentary investigates the genitourinary effects of approved smoking cessation tools versus electronic cigarettes, urging urologists to prioritize established methods over electronic cigarettes due to their potential for multisystem toxicity and uncertain long-term health implications. Further research is warranted to evaluate comprehensively the genitourinary effects of these interventions.

Keywords: e-cigarettes; urological health; genitourinary health; smoking cessation



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Electronic cigarette (e-cig) use is an increasingly prevalent phenomenon. A recent meta-analysis revealed the current prevalence of e-cig use to be 11% globally [1]. E-cigs may have a role as a smoking cessation tool for people who are looking to discontinue combustible cigarette use [2]. Given the plethora of misinformation that promotes the use of e-cigs on social media [3], some people may believe that e-cigs are an effective smoking cessation tool with minimal impacts on general health. However, there are various health risks associated with e-cig use, including, but not limited to, substance use disorder, risk of fatal poisoning, pulmonary disease, neurological effects and cardiovascular disease [4]. A recent systematic review highlighted that e-cig use may also have a negative impact on the genitourinary (GU) system [5]. Overall, the potential for multisystem toxicity [4] suggests that e-cigs should not be considered a primary option for smoking cessation. This is particularly important for urologists who treat patients with bladder cancer and must therefore regularly address smoking cessation with their patients to reduce the risk of cancer recurrence [6]. Urologists need to understand the potential risks and benefits of the various options for smoking cessation, with a particular awareness of GU effects. This paper compares the GU impact of smoking cessation tools approved under the Food and Drugs Act available in Canada in an effort to support urologists in providing guidance on smoking cessation to their patients.

Currently, approved smoking cessation tools include nicotine replacement therapy (NRT), bupropion and varenicline combined with behavioural support [7]. NRT is available in a variety of forms, including gum, lozenges, oral sprays, and inhalers [7]. Bupropion and varenicline are both forms of non-nicotine pharmacotherapy [8]. Different healthcare

providers or allied health professionals can also deliver behavioural support, including telephone quitlines and online programs [7]. Support delivered by healthcare providers may entail providing emotional support or counselling on problem-solving skills and coping with tempting situations that may result in smoking behaviour [7]. Formanek et al. [9] reported on ways to support patients who have early-stage chronic kidney disease (CKD) or end-stage renal disease (ESRD) with smoking cessation efforts. For this population, it was discussed that the most efficacious way to achieve smoking cessation is to combine both approved pharmacotherapy (such as combining different forms of NRT) and behavioural support [9]. In contrast to popular belief, e-cigs are not a reasonable first-line option to promote smoking cessation. Instead, as recommended by The Royal Australian College of General Practitioners (RACGP), e-cigs should only be used after all other therapeutic options have been tried and have failed [10]. Moreover, it is necessary that patients understand that the long-term health outcomes associated with e-cig use are unknown, and that patients who use e-cigs should be encouraged to be seen for regular follow-up [10].

Existing approved smoking cessation tools may, however, also be associated with adverse effects, including negative impacts on the GU system. Users of oral forms of NRT may have higher levels of the carcinogen N'-nitrosonornicotine (NNN) in their urine compared to users of the patch form of NRT [11]. NNN puts patients at risk for oesophageal and lung cancer [12]. Bupropion has little impact on the GU system, but night-time [13] and daytime [14] urinary incontinence have been described as extremely rare side effects in case reports. Varenicline, similarly, has minimal GU toxicity, but rare cases of acute interstitial nephritis [15] and acute renal failure [16] have been reported with its use.

Focusing on the GU toxicities of approved smoking cessation tools, the potential carcinogenic properties of e-cigs clearly stand out the most. E-cigs are associated with increased urinary levels of carcinogens, including 2-naphthylamine, o-toluidine, styrene, acrylonitrile, acrolein, propylene oxide, acrylamide, crotonaldehyde, ethylbenzene, xylene, benzene, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and tris(2-chloroethyl) phosphate (TCEP) metabolites. Although not yet clearly demonstrated, there is a concern that this exposure could increase the e-cig user's risk of bladder cancer [5]. Only one study has reported a direct association between e-cig use and bladder cancer [17]. Since urologists are often advising patients to cease smoking to reduce the risk of associated bladder cancer, this potential risk seems particularly problematic and should be emphasized in patient counselling. Beyond this, e-cig users are at an increased risk of sexual health dysfunction and lower sperm quality and quantity [18,19], which can be particularly concerning for men who are trying to conceive. In our systematic review, we reported mixed findings with respect to CKD [5].

Unfortunately, users of e-cigs may believe that e-cig use is harmless [20]. This may lead to excessive e-cig use and prolonged exposure to harmful chemicals and carcinogens. Although e-cigs usually contain lower levels of chemical toxins than cigarettes [5], the increase in usage duration and frequency may potentially offset this difference [21]. Further, it is concerning that many youths are beginning to use flavoured e-cigs as an item of choice while socializing, as it is currently unclear what long-term consequences e-cig use may have on their developing GU systems [5].

Since the evidence comparing the adverse GU effects of different smoking cessation tools to e-cigs is limited. Moving forward, future studies should evaluate the short-term, intermediate-term and long-term GU impacts of both approved smoking cessation tools and e-cigs.

In conclusion, the GU effects associated with e-cig use, along with their impact on other body systems contrasted with the reasonably low toxicity of approved smoking cessation tools, suggest that urologists should continue to promote the use of approved methods of smoking cessation over e-cigs. E-cigs should only be considered after failed efforts to cease smoking by other means, and only after clear disclosure of potential side effects and the lack of definitive knowledge of long-term risks. If a physician encounters a patient who uses e-cigs as a smoking cessation tool or primary smoking method, they

should discuss the potential impact of e-cig use on GU health and cancer risk, to enhance patients' awareness of these issues, and consider this population exposed to environmental toxin and monitor those patients accordingly.

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