

Smoking Cessation in Lung Cancer

Sule Akçay* and Balam Er Dedekarginoğlu

Baskent University Faculty of Medicine, Pulmonary Disease Department, Ankara, Turkey

*Corresponding author: Akçay S, Baskent University Faculty of Medicine, Pulmonary Disease Department, Ankara, Turkey, Tel: + 90 312 212 2912; E-mail: msuleakçay@gmail.com

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Abstract

The greatest risk factor for lung cancer is smoking. Smoking addiction is one of the challenging problems that should be solved in lung cancer patients. Including lung cancer, in cancer patients, quitting smoking has several benefits. However, implementation of smoking cessation clinics in oncology practices is inadequate and many lung cancer patients still smoke despite cancer diagnosis. Multidisciplinary lung cancer treatment programs offer effective smoking cessation services. This article reviews the best practice recommendations of tobacco addiction treatment for oncology patients in multidisciplinary practice.

Keywords Lung cancer; Multidisciplinary treatment; Smoking cessation; Tobacco

Introduction

There are only a few global health threats that must be solved as urgent as the growing use of tobacco. Smoking causes nearly 5.4 million deaths worldwide each year [1]. In Turkey, an estimated 110,000 people die in every year due to tobacco-related illnesses, including cancer, cardiovascular diseases, respiratory diseases, and others [2]. Estimated number of deaths due to tobacco by the end of 2030 is 240,000/year for Turkey [3]. In 2015, an estimated 221,000 people in the United States (US) will be diagnosed with lung cancer, representing 13% of total cancer diagnoses [4]. In contrast to prostate and breast cancer, where most patients will die due to noncancer related causes, most lung cancer patients will die due to lung cancer. As a result, of an estimated 17 million cancer survivors, only 3% are lung cancer patients [5].

The World Health Organization (WHO) has undertaken major initiatives to stop tobacco use globally. The WHO Framework Convention on Tobacco Control (FCTC) is the world's first public health treaty initiated by WHO. It provides an effective tool for tobacco control measures through legislation for all its member nations [6]. Effective tobacco control measures are essential for preventing tobacco-related diseases, especially cancer [7]. Since cigarette smoking is the most prevalent addiction among tobacco use, it will be focused on cigarette smoking in this review.

Role of Tobacco in Lung Cancer Etiology

Environmental factors might have a contribution to a genetic susceptibility and play an important role in human cancers. Cigarette smoking is a leading cause of lung cancer and responsible for 90% of lung cancer deaths. In addition, indoor air pollution particularly by second-hand smoke concerned as a cause of the lung cancer during the several decades. Cigarette smoke contains over 60 carcinogens that lead to development of cancers in the lung and at least 16 other organs [5,8]. Chronic cigarette smoke exposure causes accumulation of carcinogens that lead to DNA damage [9,10]. Cigarette smoking

contains nitrosamines, aromatic amines, aldehydes, volatile organic compounds, oxidants, and metals which might have a carcinogenic potential [5].

Smoking is the predominant risk factor for the development of both small cell and non-small cell lung cancer. Compared to nonsmokers, men and women who smoke are 23 and 13 times more likely, respectively, to develop lung cancer [11]. Women, exposed to second hand smoke because of their smoking husbands, also have greater risk to get cancer than nonsmoker women [12]. Several respiratory carcinogens such as radon, asbestos and incomplete combustion products in room air, might have an additive effect to toxic cigarette smoke and act synergistic [5].

Importance of Effective Smoking Cessation in Lung Cancer

Quitting smoking has several positive benefits in lung cancer patients. The 2014 Surgeon General's Report (SGR) analyzed the effects of smoking on cancer treatment outcomes with the following conclusions [13]

In cancer patients and survivors, the evidence is sufficient to infer a causal relationship between cigarette smoking and adverse health outcomes. Quitting smoking improves the prognosis of cancer patients;

In cancer patients and survivors, the evidence is sufficient to infer a causal relationship between cigarette smoking and increased all-cause mortality and cancer-specific mortality;

In cancer patients and survivors, the evidence is sufficient to infer a causal relationship between cigarette smoking and increased risk for second primary cancers known to be caused by cigarette smoking;

In cancer patients and survivors, the evidence is suggestive but not sufficient to infer a causal relationship between cigarette smoking and the risk of recurrence, poorer response to treatment, and increased treatment-related toxicity.

As stated by the SGR, patients who continue to smoke after a cancer diagnosis have an estimated 50% increased risk of all-cause mortality and a 60% increased risk of cancer specific mortality [13,14]. Early

stage lung cancer patients that keep on smoking have an 86% increased risk of recurrence [15]. It is stated in literature that, lung cancer patients who do not smoke, achieve a better response to chemotherapy, radiotherapy, and surgery [13,14,15]. The SGR reviewed 82 cohort studies of cancer patients that analyzed associations of smoking and cancer treatment-related toxicity [13]. Of these, 94% showed a positive association between ever smoking and increased toxicity, with 80% statistically significant. Of the 49 studies that examined current smoking, 88% showed a statistically significant positive association between current smoking and toxicity. Among lung cancer patients, smoking is associated with greater risk of post-surgical pulmonary complications such as infection and bronchopleural fistula, resistance to systemic therapy (such as chemotherapy and biologic therapy), and alterations in chemotherapy concentrations [16,17]. Additionally, lung cancer patients who smoke report worse health-related quality of life [18,19].

Role of Multidisciplinary Lung Cancer Care in Improving Smoking Cessation Services

The need for multidisciplinary care for the cancer patients is obvious. Clinician who works in smoking cessation unit should inform surgeons, medical oncologists, radiation oncologists, nurses, financial counselors, social workers, and other caregivers. This collaboration is necessary, however it is not common. Much like other aspects of cancer care, smoking is associated with a spectrum of social, demographic, and clinical variables in cancer patients [20]. Smoking is generally associated with a lower level of education and lower socioeconomic status in developed countries [21,22]. However in developing world, in contrast with this situation, smoking is generally correlated with moderate or higher socioeconomic status, especially in women [19]. In the course of lung cancer diagnosis, most of the patients are smokers for several decades and are highly nicotine dependent. Also most of these patients have already tried unsuccessfully to quit for several times and are embarrassed about their smoking addiction. This challenging clinical and psychosocial situation requires a systematic, comprehensive approach to cessation therapy to be optimally effective. Make Tobacco Cessation a Prime Clinical Goal Tobacco addiction treatment is rarely and weakly implemented in oncology practice, despite its known benefits in the general population.

Most smoking cessation help services implemented in multidisciplinary care can minimize the difficulty of quitting smoking for cancer patients [23]. It is important to educate patients about the benefits of quitting smoking, especially the potential improvement in treatment respond and life extend should be explained. This message is particularly important for smokers who are resistant to quit, which often is due to lack of confidence. A recent smoking cessation study of a thoracic oncology program found that patients with low confidence in their ability to quit smoking could be enrolled to cessation education programs to increase their courage [24]. Patients with lung cancer, who receive multidisciplinary care, are typically followed through an extended period. This extended contact provides an opportunity to tailor suggestions through the smoking cessation therapy and make modifications in an individual's treatment plan. Patients who go under a surgery process as a part of their cancer treatment can be encouraged to quit smoking by referring the reduced pulmonary complications. Increased risk of infections, difficulty with wound healing is other potential complications after surgery and these must be explained to smoker patients. Also, potential benefits of

smoking cessation such as: decreased recurrence, overall mortality, and risk of developing a second primary cancer can be emphasized. Although patients with metastatic lung cancer typically do not have a chance for cure, smoking cessation can be helpful to improve quality of life. The patient interviews and coordinated treatment provide a close communication among clinicians, which is the important component of multidisciplinary treatment.

Ensure Optimal Use of Pharmacotherapy

Although there are several FDA-approved medications that are effective for smoking cessation, including nicotine replacement (gum, patch, lozenges, inhaler, and nasal spray), Bupropion and Varenicline [25], most oncologists do not prescribe or adequately monitor their use. Multidisciplinary care provides an excellent environment to ensure that pharmacotherapy is prescribed, dosed properly, monitored for adherence and side effects, and adjusted as needed. Combination treatment, such as short and long-acting nicotine replacement (e.g.gum and patch, respectively), or nicotine replacement and Bupropion, boost quit rates over mono-treatment [25] and are likely to be useful in heavily addictive lung cancer patients. Patients often stop cessation pharmacotherapy prematurely; this situation can be effectively monitored and corrected in a multidisciplinary program. There is a growing interest among smokers about the use of electronic cigarettes ("e-cigarettes") to aid smoking cessation. However, there currently is not adequate evidence about their safety or effectiveness to recommend their use. There is no current evidence to suggest that e-cigarettes are safer or more effective than existing smoking-cessation medications also we even don't know if they are harmless [26]. Use Effective Behavioral Cessation Approaches Regarding the high levels of smoking addiction in lung cancer patients, tobacco treatment specialists have a vital role in providing state-of-the-art cessation approaches. Combining behavioral treatment with pharmacotherapy improves quitting rates over pharmacotherapy alone [25] and should be offered as a standard treatment. Importantly, clinicians at all levels should repeatedly emphasize the need to quit smoking, empathize with patients on the difficulty in quitting, and congratulate patients for progress and achieving success in quitting smoking. In conclusion, tobacco use is the predominant risk factor for lung cancer, and many lung cancer patients still smoke at the time of diagnosis. These smokers often want to quit but are highly addictive to tobacco and often feel blame for their illness and demoralized about the difficultness of quitting. Quitting smoking improves the prognosis of lung cancer, and effective methods, including several FDA-approved pharmacologic agents and well-tested behavioral strategies are available to assist addictive patients. Cancer patients who have addiction to tobacco must be the prior patients to take cessation consultant support. Treatment approach consists of both motivational support and pharmacotherapy. Cancer treatment is not a contraindication for smoking cessation therapy. Multidisciplinary lung cancer treatment programs offer an ideal environment to provide effective smoking cessation support.

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