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The Relationship between Smoking and Cancer: Mini Review

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Abstract

Once the word ''cancer'' is heard, it triggers fear and anxiety. Millions of people have lost their lives because of this illness. Although improvement of technology in recent years help the medicine for obtaining pleasing results, the reasons of this horrifying and cruel illness cannot be revealed as diagnosis. Therefore, for every cancer type the cure might not be possible. In this article of ours, we will evaluate the relationship of cancer with smoking in the latest information which is the most important factor of cancer and said ''a bad habit'' in medicine literature.

Keywords: Smoking; Nicotine; Cancer

Introduction

This review targets especially medical schools students but any clinician can benefit. So that it is a good opportunity to remember the effects of smoking. The smoking is the most important reasons of death and can be prevented kills almost half of its users. More than 1 billion people and ¼ of the adult population on Earth use cigarette and other tobacco products and it causes the death of more than 5 million people every year [1]. If we look closely to the story of the tobacco as an endemic plant, we can understand that the origin of this plant date back to the continents of South America and Australia. For the first time tobacco was brought to the Europe in the year of 1492 by the exploration of America as decoration and healing plant, later it was spread to whole world and became a substance which threatens the future of human generations. Tobacco was brought to the lands of Ottoman Empire in 1580, was started using in the year of 1600 and was started farming in 1687. 90% of tobacco which is produced in whole world is used in making cigarettes. Tobacco can gain different features in terms of the protein, carbohydrate and nicotine which are in the structure of the leave of tobacco. The leaf of tobacco and the content of the leaf can be also used as drug for animal parasites in veterinary, for bugs in agriculture, for heart diseases in medicine and for tinnitus and dizziness [2,3]. The smoke of cigarette contains more than 4.000 toxic, silica toxic and cancerogenic substances in gas and particle phase. By the every cigarette that is smoked, approximately 2-3 mg of nicotine and 20-30 ml of carbon monoxide (CO) penetrates the body. The cigarettes which have lower content of nicotine and tar can be less harmful compared to counterparts which have higher content of nicotine and tar [4-6].

The affective substances of the smoke of cigarette are; nicotine, CO and hydrocyanic. Nicotine which is the most important pharmacological substance of the smoke of cigarette is a weak base and penetrates the biological membranes depending on the pH and absorbs in lower respiratory and the alveolus of lungs. In addition, nicotine penetrates the brain rapidly. One mg of nicotine is absorbed for each cigarette who is smoking. After one cigarette is smoked, the concentration of nicotine in arterial blood increases from 31 ng/ml to 41 ng/ml. The absorption of nicotine depends on the content of the smoke which is inhaled, the depth and duration of the inhalation and the pH of the smoke. *In vivo* functions of the nicotine are complex and depend on the dosage, target organ, tolerance and autonomic tonus. The mechanisms which are responsible for the function of nicotine [5-7]. Action mechanisms of nicotine:

A. It acts in double action; at fist in ganglion as stimulant, then in autonomous ganglion as depression.

B. With the activation of nicotinic receptors in chromaffin cells, adrenal medulla and nicotinic receptors in neurons, it releases catecholamine from post-ganglionic sympathetic neurons.

C. It stimulates central nervous system.

Nicotine, which is the basic constituent of cigarette, drags person first into habitude then into addiction beginning from the first day of smoking because of its psychological effects on central nervous system. Smoking as an important reason of early deaths and preventive diseases, is one of the life threatening habits. Especially when it is consumed with alcohol, the risk of getting cancer increases considerably. Effects of tobacco on mouth and teeth can extent from an ugly appearance and malformation to life threatening situations; increases the risk of pharynx, larynx, and oesophagus cancer. Healing of scars, resulted from surgical operations or other reasons, is delayed with smoking. 30% of coronary heart diseases and cancer deaths, 80% of lung cancer is associated with smoking. Formation of chronic obstructive pulmonary diseases (COPD) such as chronic bronchitis, emphysema and deaths are also related to smoking. Every cigarette is said to decrease life span 5, 1/2 minutes and leads to 5-8 years of reduction in average life span [2-9].

Cigarette, considering the expensiveness of treatment to cancers it causes and its own price is a product which results in significant economic losses in terms of the society. By causing early deaths, it reduces working capacity and in this way it affects individual and social economy [10]. Along with the smokers, non-smokers are also exposed to harmful effects of cigarette [8]. Especially, in developing countries commonness of smoking is extremely sad. The reason of this negative situation is the marketing strategies of international tobacco

companies on developing countries [11]. Cigarette decreases the appetite and causes spending more energy during physical activities. Therefore, smokers have less body weight than non-smokers. When we look at the struggle against smoking, studies show that participation of medical staff is a necessity [12-15]. Starting from this point of view, in order to remind the importance of quitting smoking, we aimed to compile the relation between cigarette and cancer.

Cigarette and Cancer

Cigarette increases the risk or getting organ cancers. There is a strong relationship between cigarette and oral cancer, larynx, esophagus, pancreas, bladder, lung and endometrial carcinoma. Cigarette increases the death risks of lung, head and shoulder, urinary system, pancreas and bladder cancer [4-8]. Compared to nonsmokers, in middle level smokers; deaths resulted from lung cancer increase 10 times, in excess smokers increase 15-25 times. Cancer inducer effects of cigarette in the lungs involve incorrect replication, mutation and induction of enzymes activating carcinogenics. Cilia-toxic agents in the cigarette smoke and malfunction in mucosil cleaning mechanism increases active PMN leukocytes and macrophages and this lead to neutrophil elastase and production of other proteases and reduction in immunological response. However, this is not directly carcinogenic, it is a predispose factor [4]. 4-(methylnitrosamine)-1-(3-pyridyl)-1-butanone which is one of the constituents of cigarette is shown to be an animal specific carcinogenic in oral, local, subdermal and intraperitoneal applications. Cigarette increases the carcinogenic effects of industrial molecules such as asbestos and radon [4].

Cigarettes containing low-yield harmful molecules are less harmful than cigarettes containing high-yield harmful molecules [6]. Epidemiological studies have shown that low-yield cigarettes are less harmful in terms in lung, larynx, and esophagus and other cancers and probably COPD [16].

When we look at the cancers except from lung cancer, compared to nonsmoker men and women, the risk of getting bladder cancer, pancreas cancer and cervical cancer is 2-3 times more in smoker men and women. In pipe smoker, this risk increases reasonably. Risk ratio is directly proportional to daily number of smoked cigarettes, duration of smoking, and level of inhaling the smoke. Cigarette smoking has a pivotal role in carcinogenesis process for blood tumours, as well in surveillance for health related quality of life in survivors [17]. Also, it has been found that genital organ cancers are more common in smokers than nonsmokers. Risk is proportional to duration of smoking and daily number of smoked cigarettes as in cervical cancer. Interaction of cigarette with chemicals in the work place is important in the formation of bladder and kidney cancer. In workers who are busy with organic chemicals, dye, rubber, leather, tire and other manufactured products, getting bladder cancer risk increases. Especially, from aromatic amines, 2- naphthylamine and 4-aminobiphenyl are strong carcinogenics [18-21]. When smokers stop smoking, the relative risk of developing cancer gradually decreases compared with the risk in continuing smokers, but it does not fall to the level of non-smokers, since past smoking continues to have an effect even after long-time smoking cessation [22]. A report which analysed three cohort studies in Japanese subjects suggested that the risk of lung cancer in former smokers decreased to the level in non-smokers after a long period of smoking cessation [23]. We can say that it is never too late to quit smoking.

Conclusions

There is a positive correlation between smoking and lots of cancer types. The cure for the addiction of smoking is one of the duties of doctors and healthcare professionals. The smoking condition of the each patient must be questioned and they must be encouraged to quit smoking which is an addiction with no benefit. The patients must be directed to right path to quit smoking which is a threat to both individuals and community health. Moreover, the precautions which must be taken for individuals for not to start smoking should be considered as important as the efforts made for them to quit smoking. The individuals, who cannot understand the casual connection between the smoking and cancer, are not to be expected to quit smoking.

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