CHAPTER 51

Incidence of cancer among firefighters

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ABSTRACT
Firefighters are exposed to carcinogens that can increase the risk of developing various types of cancer. Many systematic reviews and articles have already been produced around the world with few conflicting conclusions. The results of several studies and analyses in Brazil, the United States, Canada, and Australia will be addressed in this article. This overview of bibliographic reviews is intended to evaluate the consistency of conclusions among the systematic reviews available on the risk of cancer in firefighters. Literature research was conducted in several indexed databases and literature available on the Internet to retrieve studies aimed at evaluating the incidence of cancer and/or cancer mortality in firefighters. The results, among others, consistently reported a significant increase in the incidence of rectal, prostate, bladder, and testicular cancer as well as melanoma in firefighters compared to those in the general population. Results of reviews and studies suggest that various types of cancer may be more frequent in firefighters than in the general population. It is necessary to rethink models already proposed and active to institutionalize prevention programs, with the modernization of equipment and standardization of technologies, in addition to prophylactic measures that face the reduction of the development of cancer risk in professionals. After scenario analysis, preventive and mitigative measures will be sought to drastically reduce the incidence of the disease.

Keywords: Firefighters, Risk, Cancer.

1 INTRODUCTION

There are numerous comprehensive reviews of recently published cancer-related literature on firefighters, along with a summary of potential carcinogens to which firefighters may be exposed. A recent study by the Industrial Injuries Advisory Council (2021) - Industrial Accident Advisory Council (IIAC), an independent scientific advisory body of the Government of England that analyses work accidents and how they are administered, found substantial evidence that firefighters could potentially be exposed to a complex mix of substances, including various carcinogens; measurements during firefighting operations may be above the work exposure limit. Heeded that many of these carcinogens are also common environmental contaminants, although generally at much lower concentrations than those experienced by firefighters.

There are a large number of published studies investigating the risk of cancer in firefighters from many countries. There is consistent evidence that mortality and incidence of cancer in firefighters are at higher risk compared to the general population. Increased risks associated with firefighting for specific types of cancer were found however, the types of cancer and the magnitude of risk estimates vary considerably between studies and between countries, the date of the study, and the time of use of firefighters in the occurrences.

2 FIREFIGHTING ACTIVITY

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The work done by firefighters differs considerably between countries and even among locations within a country. Firefighters may have to deal with many different tasks, including fighting fires in domestic buildings or industries, in vegetation, forests, and other natural environments, and on aircraft or vessels. The work can be full-time or part-time or contracted to respond to certain fires, as demanded. Some firefighters are volunteers, some professionals, and others are military. The fact is that exposures to hazardous agents differ between location and environment, regardless of the classification that can be given.

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3 ANALOGY BETWEEN STUDIES CONDUCTED IN BRAZIL AND OTHER COUNTRIES

As stated by the German news agency, Deutsche Gesetzliche Unfallversicherung Spitzenverband – DGUV (2020), by the end of October 2019, eighty-seven epidemiological studies on cancer risks in firefighters had been identified in the literature. Such studies were carried out in several ways, namely: with volunteer firefighters, military, police, female, and male, together or separately. After analyzing all studies already conducted, keeping the proportions of size and variability of each study, DGUV concluded that there is an increased risk previously demonstrated in the incidence of bladder cancer among firefighters compared to the general population. The risk of developing bladder cancer was increased by 18% and the risk of death by 72% compared to the general population. In addition, there was a 46% increase in the risk of mesothelioma. Another considered increase was kidney cancer, with a 132% increase based on three studies.

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According to the American news channel NBC News (2017), cancer is the main responsible of the death of firefighters in the United States. It also cites that the International Association of Firefighters says that cancer is currently the leading cause of death among firefighters, especially leukemia, lymphoma, or myeloma. Moreover, according to NBC, fire departments in Boston, New York, Chicago, Seattle, Los Angeles, San Francisco, Houston, Toronto, and Calgary report high cancer rates. The most aggressive cancers reported were oral, digestive, respiratory, and urinary. The researchers assure that a great reason contributing to the significant increase in rates is that firefighters today are fighting very diverse fires. Modern homes and businesses with various synthetic materials, plastics, and chemicals can explode much faster and contaminate firefighters with toxic soot

Moreira (2021) brings in his article entitled "Cancer in firefighters: the concept of protection of EPI in the long term":

> "A survey conducted by the Fire Cancer Support Network, a non-profit organization based in the United States, found that cancer accounted for two out of three deaths of retired firefighters between 2002 and 2019 – and that these professionals have a 9% higher risk of being diagnosed and 14% higher of dying from cancer than the general population. The data reinforce a 2006 study by the University of Cincinnati (USA) published in the Journal of Occupational and Environmental Medicine. The survey analyzed data from 110,000 firefighters and concluded that exposure to chemicals is a threat to the health of these professionals since the profession leads to higher rates of cancer compared to the general public."

In the United States, in 2018, another study by the National Institute of Occupational Health and Safety (NIOSH) found that firefighters are significantly more likely to develop many types of cancer than the general population, largely due to the high levels of carcinogens and other toxins found in burning buildings and hazardous environments. Firefighters have a 9% higher risk of being diagnosed with cancer and a 14% higher risk of dying from cancer than the general U.S. population, according to (NIOSH). The cancers were related to the respiratory system, in addition to the oral cavity, esophagus, large intestine, and kidneys

4 FINAL CONSIDERATIONS

Made all the above exposures, it is notorious that there are a large number of published studies investigating the risk of cancer in firefighters from many countries around the globe. There is also evidence that mortality and the incidence of cancer in firefighters, considering all existing types of cancers, analyzed together, do not present such an excessive risk compared to the general population. However, it is possible to demonstrate that fire professionals have an increased risk of some types of cancer (JALILIAN et al.,

2019:p.01). It is valid to affirm that there is a greater tendency to risk contracting the disease associated with fire fighting in various types of cancer, although risk estimates vary widely between studies, in which country was conducted, date of the study, and time of employment in combat.

It is interesting to note that there are commendable initiatives related to the attempt to reduce and mitigate the problem, in addition to assisting firefighters. One notable example is the Firefighter Cancer Support Network (FCSN), which since 2005 has been a non-profit and offers individual assistance and guidance to thousands of cancer firefighters and their families. Its mission is to assist firefighters, emergency medical service providers, and their families, diagnosed with cancer, and provide support, training, and guidance to be the global leader in cancer support, awareness, and education of firefighters.

E Effective education and better maintenance of equipment are essential to decrease the risk of cancer. The Lavender Ribbon Report of the National Council of Volunteer Firefighters and the Section of Volunteer and Combined Officers of the International Association of Firefighters describe some actions firefighters can take to reduce the risk of cancer.

Personal Protective Equipment (PPE) should be worn throughout the incident, including respiratory protective equipment throughout the occurrence, also in the aftermath. Measures such as immediate washing of exposed areas and removal of soot from the body (neck, face, arms, and hands) are suggested. Indications such as transporting the PPE in a plastic bag sealed and placed in an external compartment of the vehicle, thus keeping the PPE away from passengers and yourself are highly indicated. Finally, annual physical and clinical examinations are recommended, as early detection is the key to survival.

It is stressed that this article is not intended to exhaust, nor to limit such a broad subject concerning the incidence of cancer and mortality among firefighters.

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