

A Survey of Firefighter Cancers and Other Chronic Diseases: Preliminary Results

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Introduction

The Fire Smoke Coalition, Inc. is dedicated to creating and delivering training programs that teach firefighters about the dangers of fire smoke with a methodology of awareness, prevention, protection, detection, diagnosis and treatment.

Methods

In the course of these pursuits, one of the activities was to conduct a national survey which allowed firefighters from any role of life to report cancers and other chronic diseases. The survey was launched in June 2012 and terminated on February 1, 2014.

Results

The results of the Fire Smoke Coalition, Inc. National Cancer/Illness Survey to date are shown in the following tables.

FF Cancer Survey Responses

Question 1:

Are you:		
Volunteer	21	61.9%
Career	285	84.07%
Both	34	10.03%

Question 2:

Positions held during career:		
Firefighter	303	89.12%
Engineer	169	49.71%
Captain	138	40.59%
Lieutenant	105	30.88%
Battalion Chief	52	15.29%
Deputy Chief	32	9.41%
Chief	24	7.06%

Question 3:

Have you been diagnosed with cancer?		
Yes	188	55.79%
No	149	44.21%

Question 4:

If yes, what type of cancer?		
Thyroid	13	6.77%
Colon	18	9.38%
Bladder	6	3.12%
Prostate	39	20.31%
Lung	4	2.08%
Breast	3	1.56%
Stomach	4	2.08%
Brain	3	1.56%
Lymphoma	25	13.02%
Kidney	15	7.81%
Liver	2	1.04%
Pancreatic	0	0.00%
Testicular	17	8.85%
Other	65	33.85%

Question 5:

Do you have a family history of the same type of cancer?		
Yes	35	12.73%
No	240	87.27%

Question 6:

Have you been diagnosed with any of the following diseases/conditions?		
Cardiomyopathy	2	3.76%
ALS	0	
Parkinson's Syndrome	0	
Parkinson's Disease	0	
Other	52	96.3%

Question 7:

Do you have a family history of the disease / condition from which you suffer?		
Yes	13	6.16%
No	198	93.84%

Question 8:

What is your prognosis for life-expectancy?		
1-5 Years	20	9.01%
6-10 Years	21	9.46%
11-15 Years	10	4.50%
	174	78.3%

Question 9:

During your firefighting career, how many years would you estimate that SCBA were not, or are still not, required during fireground and overhaul operations?		
1-5 Years	102	36.69%
6-10 Years	69	43.82%
11-15 Years	47	16.91%
16-20 Years	29	10.43%
21-25 Years	14	5.04%
26-30 Years	18	6.47%

Question 10:

Does your department strictly adhere to NFPA 1404 (standards for air management) at every scene? (This includes dumpster and small pan on the stove fires.)		
Yes	79	23.37%
No	259	76.63%

Question 11:

Have you ever been treated for smoke inhalation?		
Yes	79	23.37%
No	259	76.63%

Question 12:

Have you ever experienced headaches, sore throats or nausea following a fire?		
Yes	274	81.31%
No	63	18.69%

Question 13:

Does your state have presumptive legislation that qualifies your illness/disease as work-related?		
Yes	201	63.81%
No	114	36.19%

Discussion

A variety of occupations have been found to be associated with an increased risk of adult primary brain cancers. Among these is the job of firefighter (Gomes et al, 2011; Guidotti, 2007). More than 100 firefighters die in the line-of duty every year (Winter et al, 2010). Many of these tragic deaths are due to cardiovascular events and underlying coronary artery disease, but additionally firefighters are a higher-than-normal risk of developing certain types of cancer (Winter et al, 2010; Bates, 2007; LeMasters et al,

2006). These include cancers of the brain, bladder, colon, leukemia, kidney, testicles, prostate, lung, non-Hodkins lymphoma, and multiple myeloma (Youkim, 2006; LeMasters et al, 2006). A case of a heat-induced squamous cell carcinoma of the lower extremities in a wildland firefighter has been reported (Wolfe et al, 2012).

In a study of Florida professional firefighters (n=34,796 -- 413-022 person/years), amongst males using a standardized incident analysis (SIR) method, firefighting was associated with an increased risk in both males and females, with males having an increased risk of bladder, testicular, and thyroid cancers and females having a increased risk of overall cancers, thyroid cancer, and other chronic disease (Ma et al, 2006).

Being a firefighter, whether professional, volunteer, or sometimes both means irregular hours, less-than-optimal sleep periods, being aroused at any hour of any day for any type of emergency, the potential for various types of injuries, and of seeing the effects of fires and other traumas on fellow humans. The health concerns from the firehouse perspective include the risk of various chronic diseases and especially various cancers, and may be in conflict with certain local or other authorities who might seem to wish to deny workers' compensation benefits for these very real conditions (Jahnke et al, 2012).

A survey of 332 career firefighters (57.2%), company officers (23.4%), fire chiefs (15.4%), and other fire service personnel (3.9%) found that concerns about cancer, risks of various cardiovascular diseases, and other health concerns of importance to firefighters were common (Jahnke et al, 2012).

Non-cancer increased risks in firefighters have included the potential for hearing loss (presumably noise-induced rather than age-related hypoacusis), coronary artery disease, hip osteoporosis, sarcoidosis (Crawford and Graveling, 2012). In a systematic review, the association between non-cancer conditions and the being a firefighter could not find a consistent association (Crawford and Graveling, 2012).

Firefighters are chronically exposed mostly by inhalation or skin contact, to various products of incomplete combustion which may include polycyclic aromatic hydrocarbons (PAHs) which are known experimental animal carcinogens (Ouyang et al, 2012). In 18 firefighters and 20 non-firefighter controls, it was found that the firefighters had a higher dual specificity phosphatase 22-promotor hypomethylation in blood, suggesting that cumulative exposure to combustion-derived PAHs can cause epigenetic changes in specific genes (Ouyang et al, 2012), which can be theorized to result in increased risk of cancer. Exposure to PAHs may increase firefighters' cancer risk (Ahn et al, 2012).

An early assessment of cancer outcomes in NYC after 911, suggests the following: some were judged by person-time and other ways. There did seem to be a modest but statistically significant increased risk in certain cancers (Zeig-Owens et al, 2011).

An alternate theory, not well grounded in medical-scientific data, is that radio-frequency emissions cause brain cancer in firefighters (Milham, 2009). Based on all other data available, this does not seem plausible.

Conclusion

It is quite clear from a weight-of-the-evidence approach that firefighters, whatever their status, do indeed have a somewhat of more increased risk of various cancers and of certain chronic diseases, and that workers' compensation authorities should and even must consider them in all aspects.

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