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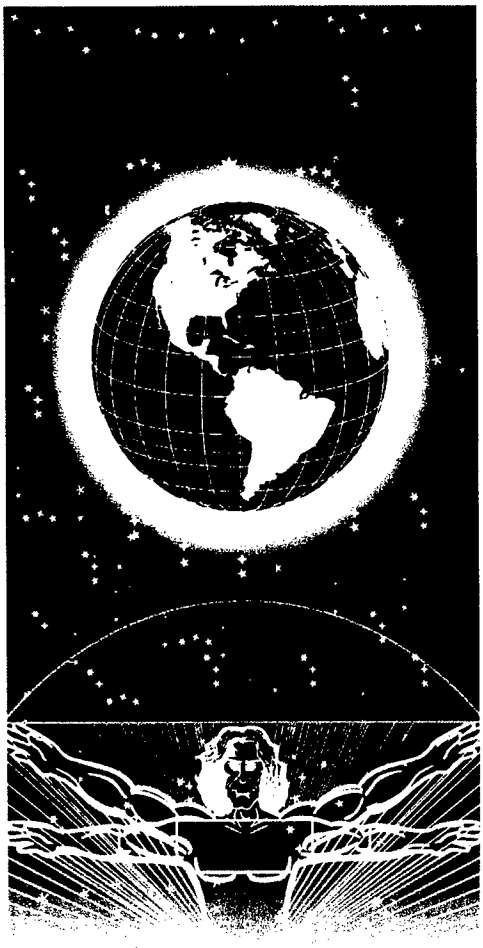

UNITED STATES AIR FORCE
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A Review of Cancer in Missileers at Malmstrom Air Force Base, Montana

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In 2001, based on concerns regarding a link between a suspected increase in cancer and work exposures for missileers at Malmstrom AFB in Montana, a group of Bio-environmental Engineers and Industrial Hygienists in coordination with Preventive and Occupational Medicine specialists from AFIOH (formerly AFIERA) conducted a site evaluation and sampling for possible chemical and biologic contaminants at their facilities. Results of all testings did not demonstrate any levels above acceptable standards according to state and federal regulations. The survey concluded that Launch Control Centers (LCCs) provide a safe and healthy working environment. Unfortunately, this information was not widely distributed to those with a need to know (specifically workers with the conditions and their families).

Since then, a list of some other cancer cases among the same population has been collected. Clearly, this perpetuates the level of concern among those affected. Four years later, based on the number of documented cancer cases and after review of available documents and new information, we believe that there is not sufficient evidence to consider the possibility of a cancer clustering to justify further investigation. We emphasize that the need for education and risk communication is critical, especially when the resulting condition can be fatal as is the case with some types of cancers.

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A REVIEW OF CANCER IN MISSILEERS AT MALMSTROM AIR FORCE BASE, MONTANA

INTRODUCTION

In 2001, based on concerns regarding a link between a suspected increase in cancer and work exposures for missileers at Malmstrom AFB in Montana, a group of Bio-environmental Engineers and Industrial Hygienists in coordination with Preventive and Occupational Medicine specialists from AFIOH (formerly AFIERA) conducted a site evaluation and sampling for possible chemical and biologic contaminants at their facilities. Results of all testing did not demonstrate any levels above acceptable standards according to state and federal regulations. The survey concluded that Launch Control Centers (LCCs) provide a safe and healthy working environment (1).

Unfortunately, this information was not widely distributed to those with a need to know (specifically workers with the conditions and their families).

Since then, a list of other cancer cases among the same population has been collected. Clearly, this perpetuates the level of concern among those affected.

Cancer, the second leading cause of death among Americans, is responsible for one of every four deaths in the United States and >2.5 million persons died of cancer during the 5-year period spanning 1996--2000. In 2004, over 560,000 Americans— or more than 1,500 people a day—died of cancer. Lung and bronchus, colorectal, prostate, and breast cancer are the four leading causes of cancer death in the United States (2).

According to the CDC, cancer is expected to become the leading cause of death within the next decade (3). However, the overall declining trend in cancer mortality demonstrates considerable progress in cancer prevention, early detection, and treatment.

The U.S. population is aging, therefore, despite advances in detection and treatment, twice the number of persons might experience and be treated for cancer in the next 50 years (4).

Cancers are of interest to the scientific and medical community (both, civilian and military), politicians and the general public. Rarely a day goes by without some new breakthrough in cancer treatment or in the identification of another substance or environmental factor which might cause cancer. But despite a remarkable number of advances in understanding the pathophysiology of the disease and treatment of the specific types of cancer, it remains an enigma, and we still have much to learn, especially in relation to causal association. While some correlations are well documented (cigarette smoking and lung cancer, radiation and skin cancer, cervical cancer and sexual behavior), others, especially those related to occupational exposures are more evasive.

Investigating a group of conditions with multiple etiologic possibilities as it is the case for cancer in relation to specific occupations makes the process extremely complex, introduces many biases and leaves room for a myriad of questions.

To conduct this review, we requested assistance from the Air Force Personnel Command (AFPC), the Defense Medical Data Center (DMDC) and the Defense Medical Surveillance System (DMSS). We acknowledge their support and the services provided.

OBJECTIVE

To review the concerns raised by missileers (including new information on the REACT - Rapid Execution and Combat Targeting conversion) that chemical and biologic exposures at their worksite also have a correlation on the increased number of cancer in their population.

METHODS

Obtain the list of missileers (provided by the Surgeon General's office, Air Force Space Command – AFSPC/SG) diagnosed with cancer.

Obtain personnel data from the Air Force Personnel Center (AFPC) on four specific specialty codes or AFSCs groups (missileers, pilots, acquisition, and logistics) to determine difference in cancer incidence rates in those communities.

Confirm official documentation by matching the information above with records on file at the Cancer Registry (DMSS) during a ten year period (1991-2000).

Review new information (specifically, documents on what is called "the REACT conversion") relevant to the individuals with cancer.

RESULTS

The original list of names provided by the AFSPC/SG office included names, minimal contact information, unit, dates at the base in question, and the following diagnoses:

- Non-Hodgkin's lymphoma (2 cases, both deceased)
- Hodgkin's lymphoma (2 cases)
- Cervical cancer (1 case)
- Thyroid cancer (3 cases)

Two other not listed here had "numerous" and "immune deficiency" problems respectively but not a cancer-related diagnosis.

Independently, after learning of our review, a total of 6 other persons voluntarily contacted our office and provided similar information. They included:

- Testicular cancer (2 cases)
- Bladder cancer (1 case)

Three others not listed here included two with no specific diagnosis at the time of this review and one with a fatty liver of unknown etiology.

It is important to note that during the time of this review we encountered several obstacles that prevented us from conducting a more in depth investigation.

First, after several attempts at obtaining data from the Personnel Center (AFPC) we decided that the information was not appropriate for any helpful statistical analysis. We found extreme difficulties in comparing between the before and after 1994 records due to internal programming coding modifications in critical variables such as AFSC, race and others on their databases. Unfortunately, we faced similar problems with data from DMDC since AFPC feeds that database.

Second, the Cancer Registry (Defense Medical Surveillance System) did not match two of the "known cancer cases." The explanation was that those were probably diagnosed outside the military network (even while members were still on active duty), however, for one reason or another, the information never reached the local MTF.

Third, although we made every effort to locate the missing medical records, we were successful in finding documentation only for one. The other was lost to follow-up.

Fourth, information on the REACT conversion specific to Malmstrom AFB was never received, however, we determined that such conversion entails removal of the missile launch control center consoles and upgrades to not only the consoles but all electronic equipment that are part of the consoles (video screens and other control and communication equipment). Furthermore, after reviewing documents on a similar type of process at a different base (5), we learned that this is generally conducted by a civilian contractor (e.g., Loral Command and Control Systems, Martin Marietta Corporation, etc.). Accordingly, whenever this type of conversion or other major overhaul of similar equipment takes place, regular and/or routine missile-related activities are suspended and/or diverted. During this time, only contractors or authorized personnel are allowed in the capsules and with appropriate personal protective equipment.

Review of chemical and biologic exposures at the worksite by the field investigation in 2001 did not point to a specific agent.

DISCUSSION

Lists of clearly recognized associations of occupational related cancers have been published elsewhere (6, 7). There is limited/suggestive evidence of an association between benzene and some types of lymphoma and even though benzene appears as a component of diesel fuels and as part of the documented testing and results of the field investigation at Malmstrom AFB in 2001, missileers are not occupationally exposed to such chemical.

CONCLUSION

Sometimes, illnesses tend to occur by chance alone and it is not uncommon to see clustering or what has been referred to as "perceived clustering" of conditions, especially when they occur in a close group of people or certain communities as in the military.

We agree with the results of the field investigation conducted by AFIOH (former AFIERA) and from the information gathered, at this time, there is no evidence of an increased number of any adverse health event that could justify further investigation. However, we stress the need for education and continued risk communication.

BIBLIOGRAPHY AND LINKS

1. Exposure Assessment of Missile Crew Members in 564th Missile Squadron Malmstrom AFB MT. CL-2001-0120 AFIERA. Dec. 2001.

2. American Cancer Society. Cancer facts & figures 2004. Atlanta, GA: American Cancer Society, 2004.

3. Cancer Mortality Surveillance --- United States, 1990—2000 (CDC) (http://www.cdc. gov/mmwr/preview/mmwrhtml/ss5303a1.htm)

4. Edwards BK, Howe HL, Ries LAG, et al. Annual report to the nation on the status of cancer, 1973--1999, featuring implications of age and aging on U.S. cancer burden. Cancer 2002;94:2766--92.

5. Ingram M. REACT Misc. Safety Documents. CD produced by Hill AFB. Aug 2004

6. Stellman JM, Stellman SD. Cancer and workplace CA 46:70, 1996.

7. Cotran, RS. Robbins Pathologic Basis of Disease, 6th ed. Saunders, 1999.