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Report/Article Title Memorandum from Frank DeStefano to Acting Director, AOP, Subject: TCDD Levels in Vietnam Veterans, dated May 1, 1986

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Description Notes Attachments include journal articles, which were not scanned. Alvin L. Young filed these documents together with others under the label, "Agent Orange Exposure Project."

**Memorandum**

Date May 1, 1986

From Medical Epidemiologist, AOP

Subject TCDD Levels in Vietnam Veterans

To Acting Director, AOP

Prior to recent studies, estimation of 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD) half lives had been based on extrapolation from animal models which suggested that the half-life in humans should be about one year. The recent human studies, however, indicate that the half-life in adipose tissue may be much longer—on the order of 5 years or more (1,2). If the half-life of TCDD in human adipose tissue is five years or more, it should be possible to detect appreciable elevations in TCDD levels in Vietnam veterans fifteen to twenty years after potential exposure (i.e., after three or four half-lives). At least two studies suggest that this may be the case.

A study in 1984, found a significant correlation between degree of exposure to Agent Orange in Vietnam and tissue levels of TCDD (3) (a copy of the article along with a review of the study by Lee and Hobson are attached). The adipose tissue samples were obtained from 23 self-selected Vietnam veterans who believed they had been exposed to Agent Orange. All samples were taken eight or more years after potential exposure. Adipose samples also were obtained during elective surgery from 10 veterans who had not been in Vietnam. Classification of likelihood of exposure to Agent Orange was initially done by the Veterans Administration (VA) based on the veterans' reported information. An additional classification was performed by the Army Agent Orange Task Force (AAOTF) based on the veterans' military records. Two of the three veterans classified as "heavily exposed" by the VA had the highest TCDD levels—99 and 35 parts per trillion (ppt). The third "heavily exposed" veteran did not have TCDD detected, but the results of this particular veteran's assay are questionable because only 20% of the internal standard was recovered. An assay of another sample of this same veteran's adipose tissue which was performed by another laboratory detected TCDD at a level of 20 ppt. These three veterans classified as "heavily exposed" by the VA were also in the highest exposure category as determined by the AAOTF. The less heavily exposed veterans by either classification did not differ appreciably in TCDD levels from unexposed controls; mean TCDD levels in these groups were 5-6 ppt.

Another study found that 14 years after the last known application of Agent Orange, levels of TCDD in adipose tissue of Vietnamese living in the south, on average, were higher than in persons living in the north of Vietnam (4) (copy attached). Adipose tissue specimens were collected in 1984 in Hanoi and Ho Chi Minh City hospitals from patients undergoing surgery or from autopsy cases. The authors stated that most of the specimens from the south came from persons

who lived in outlying provinces away from Ho Chi Minh City. Twelve of fifteen specimens obtained from the south had detectable TCDD levels with an average of 28 ppt (range: 3-103 ppt). Samples in the north were taken from people who had never been in the southern part of Vietnam and had no known exposure to Agent Orange. None of the nine samples from the north had detectable levels of TCDD (detection limit 2-3 ppt). The authors concluded that at least part of the TCDD in the South Vietnamese samples was due to Agent Orange exposure.

The above studies suggest that TCDD persists in human tissues for five years or longer and that some Vietnam veterans may have been exposed to high enough levels of TCDD to still have detectably elevated levels 15 to 20 years after exposure. These results raise the possibility of measuring tissue levels of TCDD in Vietnam veterans as an objective marker of Agent Orange exposure.



Frank DeStefano, M.D., M.P.H.

Attachments

REFERENCES

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