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Agent Orange exposure and disease prevalence in Korean Vietnam veterans: The Korean veterans health study.

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## **Abstract**

Between 1961 and 1971, military herbicides were used by the United States and allied forces for military purposes. Agent Orange, the most-used herbicide, was a mixture of 2,4dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid, and contained an impurity of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Many Korean Vietnam veterans were exposed to Agent Orange during the Vietnam War. The aim of this study was to evaluate the association between Agent Orange exposure and the prevalence of diseases of the endocrine, nervous, circulatory, respiratory, and digestive systems. The Agent Orange exposure was assessed by a geographic information system-based model. A total of 111,726 Korean Vietnam veterans were analyzed for prevalence using the Korea National Health Insurance claims data from January 2000 to September 2005. After adjusting for covariates, the high exposure group had modestly elevated odds ratios (ORs) for endocrine diseases combined and neurologic diseases combined. The adjusted ORs were significantly higher in the high exposure group than in the low exposure group for hypothyroidism (OR=1.13), autoimmune thyroiditis (OR=1.93), diabetes mellitus (OR=1.04), other endocrine gland disorders including pituitary gland disorders (OR=1.43), amyloidosis (OR=3.02), systemic atrophies affecting the nervous system including spinal muscular atrophy (OR=1.27), Alzheimer disease (OR=1.64), peripheral polyneuropathies (OR=1.09), angina pectoris (OR=1.04), stroke (OR=1.09), chronic obstructive pulmonary diseases (COPD) including chronic bronchitis (OR=1.05) and bronchiectasis (OR=1.16), asthma (OR=1.04), peptic ulcer (OR=1.03), and liver cirrhosis (OR=1.08). In conclusion, Agent Orange exposure increased the prevalence of endocrine disorders, especially in the thyroid and pituitary gland; various neurologic diseases; COPD: and liver cirrhosis. Overall, this study suggests that Agent Orange/2,4-D/TCDD exposure several decades earlier may increase morbidity from various diseases, some of which have rarely been explored in previous epidemiologic studies.

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## **KEYWORDS:**

Agent Orange; Dioxins; Herbicides; Prevalence; Veterans