Pulmonary Thromboembolism in American Indians and Alaskan Natives
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Background: The rate of diagnosis of deep venous thrombosis and/or pulmonary embolism (collectively, venous thromboembolism: VTE) among patients discharged from Indian Health Service hospital care from 1980 through 1996 was considerably lower than rates reported in African Americans or whites. Expansion of the national census in 1990 to include American Indians and Alaskan Natives permits a more in-depth examination of this issue.

Methods: Combined data from the National Hospital Discharge Survey (nonfederal hospitals) and the Indian Health Service (federal hospitals) from 1996 through 2001 were used to evaluate the rate of diagnosis of VTE in American Indians and Alaskan Natives.

Results: The diagnosis of VTE in American Indians and Alaskan Natives, based on combined data from the National Hospital Discharge Survey and the Indian Health Service was 71 per 100000 per year compared with 155 per 100000 per year in African Americans (P<.001) and 131 per 100000 per year in whites (P<.001). The rate ratio comparing the rate of diagnosis of VTE in American Indians and Alaskan Natives with African Americans was 0.46 (95% confidence interval, 0.45-0.47) and comparing American Indians and Alaskan Natives with whites it was 0.54 (95% confidence interval, 0.53-0.55).

Conclusions: The observed relatively low incidence of VTE in American Indians and Alaskan Natives would seem to be due to as yet undetermined genetic factors. The possibility that American Indians and Alaskan Natives have different lifestyles that affect the rate of diagnosis of VTE cannot be excluded.

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Diagnoses from the NHDS and the Indian Health Service were based on the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). The ICD-9-CM codes that we used for identification of patients with pulmonary embolism (PE) were 415.1, 634.6, 635.6, 636.6, 637.6, 638.6, and 673.2. The codes used for deep venous thrombosis (DVT) were 451.1, 451.2, 451.8, 451.9, 453.2, 453.8, 453.9, 671.3, 671.4, and 671.9. Five-digit codes (eg, 451.11) were not listed separately because they were included under the corresponding 4-digit codes (eg, 451.1). Yearly population estimates by race were obtained from the US Bureau of the Census.3

STATISTICAL ANALYSIS AND METHODOLOGIC CONSIDERATIONS

Rates of diagnosis of PE, DVT, or either by the sum of the yearly census estimates of patients hospitalized over the period of interest with a diagnosis of PE, DVT, or either by the sum of the yearly number of patients (number of diagnoses per 100 000 population per year) were calculated by dividing the sum of the yearly number of diagnoses by the 100 000 population. Rate ratios and 95% confidence intervals (CIs) were calculated using GraphPad InStat version 3.0 (San Diego, Calif). One-way analysis of variance was used to compare rates among races using SPSS, version 11.5 (SPSS Inc, Chicago, Ill). The t test was used for paired comparisons.

RESULTS

From 1996 through 2001, the rate of diagnosis of VTE (PE and/or DVT) in American Indians and Alaskan Natives, based on combined data from the NHDS and the Indian Health Service, was 71 per 100 000 per year compared with 155 per 100 000 per year in African Americans (P < .001) and 131 per 100 000 per year in whites (P < .001) (Figure). Rates of diagnosis of DVT according to race are also shown in the Figure, but the number of PE diagnoses in American Indians and Alaskan Natives was too low to give an accurate estimate of the rate of diagnosis.

The rate ratio, comparing the rate of diagnosis of VTE in American Indians and Alaskan Natives with that in African Americans, was 0.46 (95% CI, 0.45-0.47) and comparing American Indians and Alaskan Natives with whites it was 0.54 (95% CI, 0.53-0.55). The rate ratios comparing DVT in American Indians and Alaskan Natives with that in African Americans and whites were 0.44 (95% CI, 0.43-0.45) and 0.52 (95% CI, 0.51-0.53), respectively.

Only 1 patient with PE was hospitalized in Indian Health Service hospitals between 1996 and 2001. During this interval, an estimated 420 000 patients were hospitalized.

COMMENT

American Indians and Alaskan Natives had a lower rate of diagnosis of VTE than African Americans or whites. Indian Health Service hospitals, being federal hospitals, are not included in the NHDS. Tribally operated hospitals and hospitals that have contracted with the Indian Health Service would have been included in the NHDS. The rate of diagnosis of VTE was consistent with the rate of diagnosis estimated on the basis of the Indian Health Service user population.1

Relative values comparing rates among races are likely to be more accurate than absolute values. The rates of diagnosis of PE and DVT obtained from the NHDS and from discharge codes of patients from Indian Health Service hospitals depend on the sensitivity and specificity of diagnostic codes at discharge from the hospital. Review and reabstraction of a sample of Medicare hospitalizations from late 1984 and early 1985 showed that for pulmonary embolism, 92% of codable cases were on the abstract. Others showed that 93% of proven cases of PE at autopsy, if recognized ante mortem, were coded at hospital discharge.8 Regarding the robustness of discharge codes for DVT, White et al7 validated 92% of coded cases of idiopathic DVT.

We previously showed a 0.4% incidence of PE in hospitalized whites and African Americans aged 20 years or older throughout the United States, based on the NHDS use of ICD-9 codes.8 This was remarkably close to the incidence of PE in a university hospital (0.4%),6 a tertiary care center (0.5%),9 and a community teaching hospital (0.3%).10 These incidences were obtained based on retrospective review of multiple data sources, including radiographic reports and autopsies (but not including estimates of unsuspected deaths from PE when no autopsy was performed). The incidence of PE in hospitalized patients in Indian Health Service hospitals, 1 in about 420 000 patients, is orders of magnitude lower than these values.

The relatively low incidence of VTE in American Indians and Alaskan Natives would seem to be due to as yet undetermined genetic factors. A lower prevalence of factor V Leiden in American Indian and Alaskan Native populations (1.25%) compared with whites (5.3%) perhaps contributes to the lower incidence of VTE in American Indians and Alaskan Natives.11 The concept that racial groups can differ genetically and that the differences can have medical importance has recently been discussed.12 The possibility that American Indians and Alas-
Natives have different diets or lifestyles that affect the rate of diagnosis of VTE cannot be excluded.\textsuperscript{13}

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\textbf{REFERENCES}


