Are There Differences in Vascular Disease Between Ethnic and Racial Groups?

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The study of disease differences between ethnic and racial groups is complicated by the genetic, environmental, and cultural heterogeneity within each group. Despite these complications, the study of well-defined groups of people can yield medical information useful to improve health in these groups. For example, moyamoya disease has a predilection for Japanese people, the incidence of stroke is higher in blacks than in whites,1 and occlusive cerebrovascular lesions are more likely to be intracranial in blacks than whites.2-4 This information can be used to optimize risk factor screening and management, acute stroke treatment, and secondary stroke prevention in the various ethnic and racial groups.

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Relatively little is known about cerebrovascular disease in Hispanics and Native Americans in the southwestern United States. Hispanics constitute \( \approx 9.0\% \) of the US population according to the 1990 US census, and a large majority of them live in the southwestern United States. The ancestors of the Hispanics in the southwestern United States are mainly the settlers and conquerors who came from Spain starting in the 16th century. Since their arrival in the southern part of North America, there has been cultural and genetic interaction between the Spanish and the various Native American tribes living in this region. The Hispanics who relatively recently immigrated from Mexico to the southwestern United States have a similar ancestry.

Differences in vascular risks have been measured between US Hispanics and non-Hispanic whites. US Hispanics appear to have a lower prevalence and severity of arterial hypertension and lower levels of serum cholesterol but higher prevalence of diabetes mellitus, tobacco smoking, and obesity than non-Hispanic whites.5 These differences in vascular risks may lead to variances in the manifestation of cerebrovascular disease between Hispanics and non-Hispanic whites. The incidence of intracerebral hemorrhage6 and subarachnoid hemorrhage7 in central New Mexico is significantly higher among Hispanics than non-Hispanic whites. The reasons for these differences have not been investigated. It is important and interesting to observe that Hispanics in New York City, who have different ancestry than Hispanics in New Mexico, also have an increased incidence of hemorrhagic strokes as compared with whites.8 Although the prevalence is probably very low, familial cerebral cavernous vascular malformations predominate in Hispanics in the southwestern United States.9,10

Native Americans constitute \( \approx 0.8\% \) of the US population according to the 1990 US census. The Native Americans came to the Americas from Asia tens of thousands of years ago, when the Bering Straights area was land connecting the two continents. Before the arrival of Europeans in the Americas, Native Americans had already spread over the continents and developed a variety of cultures influenced by various ecological conditions. In the southwestern United States, Native Americans have been divided into four groups, the Yuma, Pima-Papago, Pueblo, and Apache. These groups probably are exposed to different vascular risks and have different attitudes toward health and illness. These differences are likely to influence the extent of detection and control of vascular risks. Since the arrival of Europeans in the Americas, cultural and genetic integration with Native Americans has been occurring to some degree. Some Native Americans live on reservations, but most live in neighboring communities and periodically visit their native reservation. Consequently, Native Americans in the southwestern United States are heterogeneous people. An example of a physiological difference between the Native American tribes in the southwestern United States is the unusually high prevalence of diabetes mellitus among the Pima Indians of Arizona.11,12 Studying a combination of Native American groups may mask differences between them.

The available cardiovascular data on Native Americans from various parts of the United States, mainly from the National Health and Nutrition Examination Survey I and II, suggest that they may have a higher prevalence of diabetes mellitus, tobacco smoking, and obesity than whites.13 Additional well-documented cardiovascular risk factor information, including alcoholism and drug abuse, in well-defined homogeneous Native American populations is needed to optimize vascular disease prevention efforts.

The best way to study differences between ethnic or racial groups is to investigate community populations by using standardized diagnostic criteria and verified diagnoses. Hospital-based studies are prone to patient selection bias. Patients referred to a given medical center are selected on the basis of their health insurance coverage, a specific disorder in which the receiving medical center specializes, the interest and confidence with which the referring physicians treat patients with similar disorders, presence of other complicating diseases, and proximity to the medical center. A large proportion of patients with similar disorders, living in the same community, are probably not referred to the study center unless it is the
only medical facility for a given community. This is beyond the control of the investigators. Because of this unavoidable bias, results from a hospital-based study may or may not apply to the same groups of people living in the community. For example, in the study published in this issue of the journal, the proportion of stroke patients with intracerebral hemorrhage is unusually high among whites (37%) and Hispanics (48%). The expected proportion of intracerebral hemorrhages among whites is 10%, based on various other stroke registries. The proportion of strokes due to intracerebral hemorrhage among Hispanics has not been studied in a southwestern US community population, but in New York City it was 11%. This is one reason why the subjects in this study are unlikely to be a representative sample of stroke patients in the community.

Another possible source of confusion from epidemiological studies is when results are based solely on diagnostic codes or death certificates. These documents are completed by a variety of people without specific standardized guidelines. In some instances, the diagnosis of stroke may be questionable or key diagnostic tests may be missing. This could lead to coding inaccuracies. In instances in which the cause of death is unconfirmed, the designation may be based on the presence of risk factors and other available clinical information. The accuracy of such determinations is likely to be low. Consequently, the accuracy of these medical documents are variable, and the results based on them may be erroneous. Review of pertinent medical records with standardized and reasonably strict criteria to confirm the diagnoses will minimize errors.

Only community-based studies, with proper standardized definitions and verified diagnoses of the disorders being investigated, will convincingly answer the important questions regarding vascular differences between various ethnic and racial groups. In addition, to maximize the chances of demonstrating differences between ethnic and racial groups, if they exist, each group should be defined to make it as homogeneous as is reasonably possible. Ancestry, environment, and culture should be similar within each group.

**References**

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