



Ethnicity of Patients With Venous Thromboembolism – The Incidence of Venous Thromboembolism in an Asian Population –

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The incidence and prevalence of some diseases are associated with ethnic disparity. For example, the prevalence of systemic hypertension is higher among African-Americans than Caucasians. In addition, African-Americans have higher morbidity and mortality rates of cardiovascular disease.¹ Venous thromboembolism (VTE), comprising deep vein thrombosis (DVT) and pulmonary embolism (PE), is the third leading cause of death after ischemic heart disease and stroke in the USA and ethnicity might also be involved in its incidence. White et al identified 17,991 patients with idiopathic DVT and 5,573 with secondary VTE based on the 1996 California Patient Discharge Data Set and calculated the standardized age- and sex-adjusted incidence of both.² The annual incidence of idiopathic DVT per million persons was 293 for black Americans, 230 for white Americans, 139 for Hispanics and 60 for Pacific Islanders and Asians.² Adjusting for race misclassification, the incidence of VTE per 100,000 derived from the same database was 141 for African-Americans, 104 for Caucasians, 55 for Hispanics, and 21 for Asian/Pacific Islanders.³ These findings indicated that African-Americans and Asian/Pacific Islanders were more and less likely, respectively, than Caucasians to develop VTE. Indeed, Asian/Pacific Islanders have a 3- to 5-fold lower incidence of symptomatic first-time idiopathic and secondary VTE.⁴ Jang et al reported that the annual incidence of VTE, DVT and PE per 100,000 in Korea during 2008 was 13.8, 5.31 and 7.01, respectively, although the incidence has increased annually.⁵ Sakuma et al reported that the incidence of PE and DVT among Japanese was 61.9 and 115.5 per million, respectively, although the incidence of PE increased 2.25-fold in 1 decade.⁶ Inter-Asian ethnic disparity might also affect the risk of developing conditions such as coronary artery disease, hypertension and hemorrhagic stroke.¹

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In this issue of the Journal, Lee et al analyze the incidence of symptomatic VTE in 2002 with ICD-9-CM codes in the Taiwanese National Health Insurance claims database, which includes almost the entire population of Taiwan.⁷ The incidence of VTE and PE among Taiwanese adults was 16.5 and 4.8 per 100,000, respectively. The incidence of VTE was

lower in Taiwanese than among Caucasians and African-Americans and was similar to that of other Asians according to comparisons with the reports described above. Thus, the risk of VTE might be lower among Asian populations.

We can consider why the incidence of VTE is lower among Asians than Caucasians and African-Americans.

Genetic factors might be one explanation. The factor V Leiden (FVL) mutation, which is the most frequent cause of resistance to activated protein C, is found in approximately 5% of Caucasians, but rarely in Asians.⁸ Homozygosity of FVL is associated with a 50- to 100-fold higher risk of VTE. The G20210A thrombin gene that is associated with increased plasma prothrombin might also be less prevalent among Asians.⁹ Furthermore, levels of fibrinogen, FVIIc and FVIIIc, as well as obesity rates, are reportedly lower among Asian populations.¹⁰ The authors also showed that survivors of VTE have a lower primary hypercoagulable status, including these gene mutations, than non-survivors.⁷ However, mutations of FVL and the thrombin gene are rare among African-Americans with VTE,¹¹ which obscures the contribution of these gene mutations to the incidence of VTE. Thus, in addition to genetic predisposition, differences in lifestyle traits, obesity and psychosocial stress might contribute to the development of VTE. However, the relationship between VTE and obesity, alcohol consumption and smoking could not be discerned from the database used herein.

Controversy surrounds seasonal variations in the incidence of VTE. Gallerani et al found a significant increase in VTE during the winter, which might be related to increased hypercoagulability.¹² In contrast, no seasonal distribution of VTE incidence has been otherwise identified, including in the Taiwanese population.⁷ In addition, no relationship between VTE incidence and humidity, temperature, or atmospheric pressure has been confirmed, though the subtropical climate of Taiwan might have contributed to these findings. Another possible cause might be the hospital situation, without seasonal variations, given that approximately half of PE patients develop the disease while in hospital.

Regarding the short-term mortality rate of VTE, fatalities of patients with PE were higher than for those with DVT.¹³ The authors found that 1-month mortality rates among patients with PE and DVT were similar to those previously

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reported and that PE is an independent predictor of mortality.⁷ Because PE might induce a fatal status, the difference in the mortality rates was acceptable. In addition, the type of PE, massive or non-massive, might be important for predicting its prognosis. Although Sakuma et al demonstrated that implantation with inferior vena cava filters reduces mortality from acute PE,¹⁴ the authors did not find that they conferred a benefit on short-term mortality because of the low proportion of implantations.

Lee et al demonstrated the epidemiology of VTE in Taiwan using a nationwide database.⁷ Their findings are thought to reflect whole Taiwanese traits and might lead to appropriate prophylaxis and treatment for Taiwanese. Taking into account the similar incidence of VTE in Taiwan and in other Asian countries, a universal method of prophylaxis and treatment might be applicable to all Asian populations. If so, the guidelines for the diagnosis, treatment and prevention of pulmonary thromboembolism and DVT published by the Japanese Circulation Society¹⁵ might serve as a useful reference. However, contributing factors to VTE, such as climate, altitude, behavioral traits and socio-economic status, remain to be defined according to the location and custom of each Asian country. Because the incidence of VTE, as well as the proportion of elderly persons, is increasing annually, the epidemiology of VTE will require upgrading to improve management strategies.

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