Hyperinsulinemia and Estrogen-Deficiency as Risk Factors for Stroke in Women

To the Editor:

We read with great interest the recent article by Dr. Ho and colleagues dealing with the relationship between diabetes and stroke mortality in women. The results of their study demonstrated that women with diabetes mellitus and no prevalent cardiovascular diseases (CVD) had a 3-fold–increased fatal stroke risk compared with nondiabetic women without CVD. They proposed that, although stroke mortality was highest among women with prior stroke, diabetes carries a fatal stroke risk similar to that of a history of prior stroke and may warrant more aggressive treatment strategies in the future prevention of stroke.

Numerous studies have already shown a role of hyperinsulinemia in the pathogenesis of vascular complications in circulatory disorders. Sela et al demonstrated that polymorphonuclear leukocytes (PMN) in essential hypertension showed increased level of intracellular calcium content correlating positively with the individual’s blood pressure and plasma insulin. They proposed that, because PMN priming may lead to oxidative stress and inflammation, intracellular calcium and insulin are involved in the pathogenesis of hypertension-induced vascular injury. In a study we presented earlier, a relationship between membrane fluidity (a reciprocal value of membrane microviscosity) of erythrocytes and insulin was investigated in essential hypertensive patients with a concomitant increase in plasma NO metabolite level. It is possible that insulin and estrogen may exert opposite effects on membrane microviscosity of erythrocytes, although the precise mechanism underlying their modulatory effects on the membrane function is still uncertain. In this context, we speculate that both hyperinsulinemia and estrogen-deficiency could cause a disturbance in the blood rheologic behavior and the microcirculation. These abnormalities may induce vascular complications in women. It would be necessary to assess more precisely the roles of hyperinsulinemia and estrogen-deficiency and their contribution to the risk for stroke in women.

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