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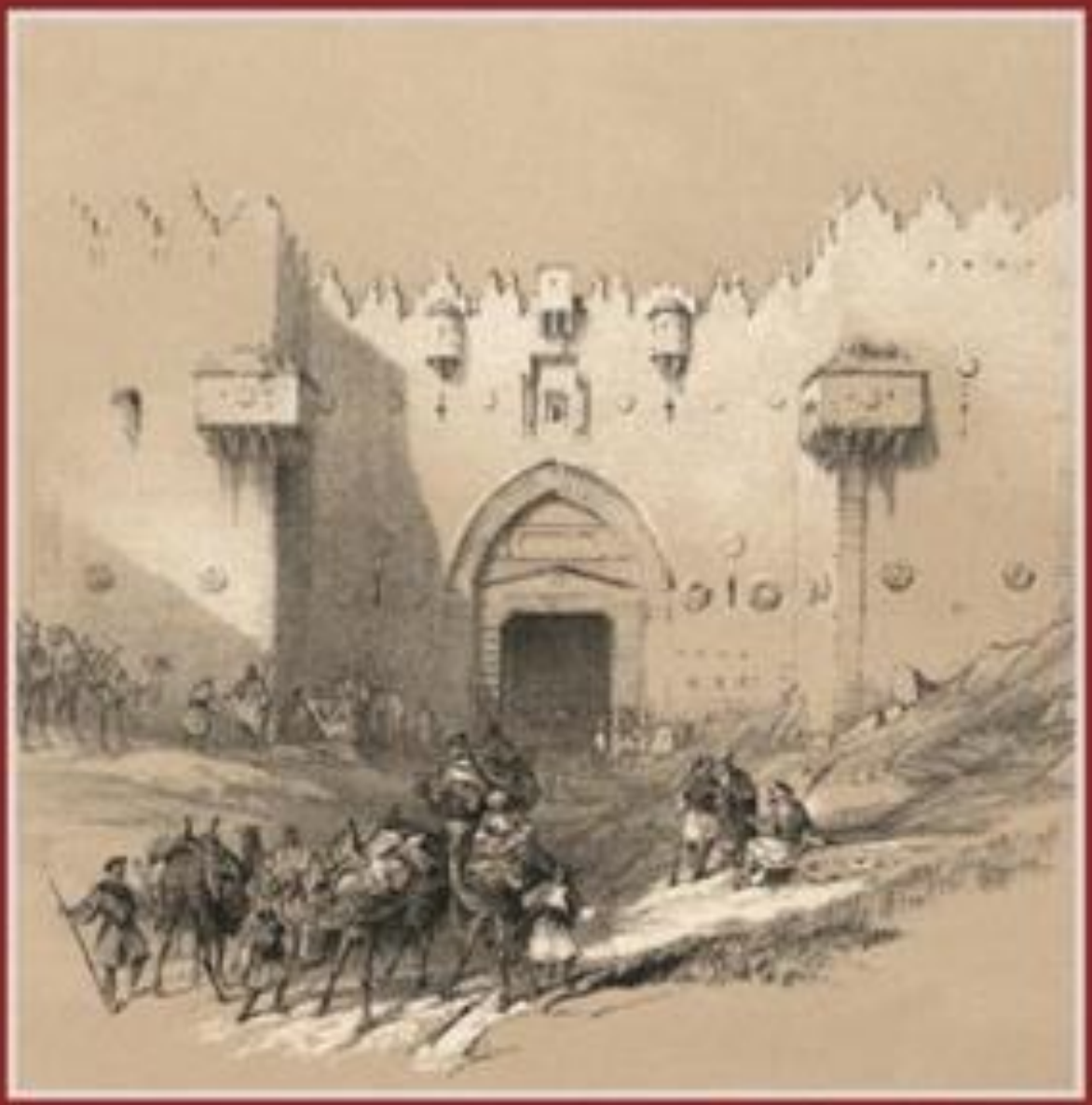

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Vagus Nerve Stimulation Activates Central Nervous System Structures in Epileptic Patients during PET H215O Blood Flow Imaging

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To the Editor: We read with interest and excitement the article by Ko et al. (1). The findings were exceedingly interesting in that vagal nerve stimulation significantly reduced the seizures in the one patient in whom there was a significant increase in regional cerebral blood flow (CBF) in four different regions of the brain.

This information coincides with our findings that epileptogenicity is a function of cerebral perfusion. We have continuously monitored cortical blood flow (CrBF) in 13 patients with 43 epileptic seizures. There is a significant increase in epileptic temporal lobe CrBF approximately 10 to 20 minutes before the electrical seizure onset. At the same time, the CrBF decreases in the nonepileptic temporal lobe. During the epileptic seizure, CrBF increases bilaterally and the late postictal CrBF is significantly reduced in the epileptic temporal lobe. That the CrBF changes precede the electrical changes with seizure onset implies that there is a vasomotor abnormality that triggers the electrical event. This is compatible with the observations presented by Penfield (2,3) and Penfield et al. (4) and with alterations in CrBF around arteriovenous malformations and cerebral tumors (5,6), both of which significantly predispose to epileptic seizures.

The finding that vagal nerve stimulation alters CBF in different cerebral regions is in agreement with the vasomotor theory of epileptogenicity. Generally, one assumes that CBF changes are dependent on the cerebral metabolic activity; however, in pathological conditions, this is not necessarily the case. It would be exceedingly interesting to know what the metabolic activity of the brain tissue in the regions of elevated CBF is during the vagal nerve stimulation. This could very easily be accomplished with measurements of glucose utilization during the positron-emission tomographic study. We look forward to further expansion of the studies by Ko et al.

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