Cerebrovasc Dis 2011;32:301
DOI: [10.1159/000329378](https://doi.org/10.1159/000329378)

Underestimating the Importance of Middle Cerebral Artery Atherosclerosis in Lacunar Stroke

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Wardlaw et al. [1] report the findings of transcranial Doppler measurement of middle cerebral artery (MCA) flow velocities in 67 lacunar and 67 cortical stroke patients. In their study, they note no difference in the recorded velocities between these two groups and draw the conclusion that 'MCA atheromatous stenosis is unlikely to be a common cause of lacunar stroke in white populations'. It is of concern that the authors argue for a lack of importance of MCA disease solely on the basis of transcranial Doppler velocities.

MCA atherosclerosis is a disease of ever-growing recognition in non-Caucasian populations. As the authors point out, many autopsy and imaging studies have noted MCA stenosis in up to half of acute and fatal stroke patients of largely Asian ethnicity though this pathology is largely unknown or underestimated in Western societies [2, 3]. In Caucasian cohorts, the prevalence of MCA disease is largely unexplored, though one Parisian study demonstrates stenotic intracranial arterial plaque in 37.2% of stroke fatalities [4].

Wardlaw et al. must be thanked for their efforts in attempting to detect steno-occlusive lesions within the MCA in an underappreciated population, but should be cautioned against dismissing the possible involvement of MCA disease in lacunar stroke solely on this limited study. One key limitation of this work is the temporal association between initial presentation and recording of arterial velocities. It is most likely that arterial remodeling and cerebral autoregulation will play some role in normalizing arterial velocities during the minimum 1-month delay employed by the study authors. Another key limitation is the use of transcranial Doppler sonography to define MCA stenosis; others have previously demonstrated the greater sensitivity of computed tomo-

graphic angiography and have directly warned against using transcranial Doppler sonography as a screening method for MCA stenosis [5].

In addition, the authors' fundamental conclusion that MCA disease is not present in lacunar stroke is predicated on the assumption that hemodynamic changes are the sole mechanism by which MCA disease yields symptoms. It is well established in the carotid imaging literature that nonocclusive lesions with little stenotic effect can constitute vulnerable lesions via a thromboembolic pathway [6].

Therefore, what is clear from the laudable work of Wardlaw et al. is that MCA disease requires further attention using modalities such as magnetic resonance imaging which directly visualizes the presence of plaque rather than merely hemodynamic changes which may or may not be present after stroke [7].

References

- 1 Wardlaw JM, Doubal FN, Eadie E, Chappell F, Shuler K, Cvorovic V: Little association between intracranial arterial stenosis and lacunar stroke. *Cerebrovasc Dis* 2011;31:12–18.
- 2 Wong LK: Global burden of intracranial atherosclerosis. *Int J Stroke* 2006;1:158–159.
- 3 Arenillas JF: Intracranial atherosclerosis: current concepts. *Stroke* 2011;42(suppl):S20–S23.
- 4 Mazighi M, Labreuche J, Gongora-Rivera F, Duyckaerts C, Hauw JJ, Amarenco P: Autopsy prevalence of intracranial atherosclerosis in patients with fatal stroke. *Stroke* 2008;39:1142–1147.
- 5 Suwanwela NC, Phanthumchinda K, Suwanwela N: Transcranial Doppler sonography and CT angiography in patients with atherothrombotic middle cerebral artery stroke. *AJNR Am J Neuroradiol* 2002;23:1352–1355.
- 6 Wasserman BA, Wityk RJ, Trout HH 3rd, Virmani R: Low-grade carotid stenosis: looking beyond the lumen with MRI. *Stroke* 2005;36:2504–2513.
- 7 Xu WH, Li ML, Gao S, Ni J, Zhou LX, Yao M, et al: In vivo high-resolution MR imaging of symptomatic and asymptomatic middle cerebral artery atherosclerotic stenosis. *Atherosclerosis* 2010;212:507–511.

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