Chimowitz et al refer to preliminary data suggesting increased fibrinogen in patients with SEC. We have shown that fibrinogen is an independent risk factor for left atrial SEC in patients with nonvalvular atrial fibrillation and that both fibrinogen and SEC are independently associated with embolic events. The relationship between SEC and embolism therefore appears complex, comprising both hemostatic and hemodynamic abnormalities and both cardioembolic and other mechanisms of stroke.

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References

Response
In a prospective study, groups of patients with and without a particular risk factor are followed over time to determine the rates at which they develop a specific disease. Neither our study nor the one by Black et al followed patients with and without SEC to determine their rates of cerebral or systemic embolism. In both studies only embolic events that occurred before identification of SEC were documented. As such, neither of these studies provide a prospective evaluation of the embolic risk posed by SEC. The fact that patients were identified for the study by Black et al at the time of transesophageal echocardiography rather than by review of the echocardiography reports is not a sufficient condition to ensure a prospective study.

The recent studies on SEC by Black et al that are referenced in their letter are of considerable interest. We look forward to publication of the study on future cardiac events in patients with SEC, which to our knowledge is the first prospective evaluation of the embolic risk associated with SEC.

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References

Flow and Velocity During Autoregulation Testing in Humans
To the Editor:
It may be unusual to write a letter to the editor referring to an abstract rather than to an original publication. Nevertheless, the summary of the paper read by Newell et al at the 19th International Joint Conference on Stroke and Cerebral Circulation and published in the January issue of Stroke appears to need some comment.

Newell et al measured the percent changes of middle cerebral artery (MCA) velocity by transcranial Doppler sonography and those of internal carotid artery (ICA) flow by electromagnetic flowmetry in seven patients who had undergone carotid endarterectomy. In these patients a drop in arterial blood pressure (ABP) was induced by deflating leg cuffs after 3 minutes of inflation to suprasystolic pressure. From the evidence of identical curves for MCA velocity and ICA flow, Newell et al concluded that changes in time-averaged MCA velocity accurately reflect the changes in ICA flow during autoregulation. This may be true in cases in which autoregulatory dilatation is limited to the small cerebral arteries and does not include the trunks of the basal arteries.

In our own experience, using a type of Doppler signal analysis that includes the measurement of signal power as a function of vessel caliber, there was clear evidence that the middle cerebral artery trunk is included in autoregulatory vasodilation both in orthostasis and lower body negative pressure tests of autoregulation. The same effect can be observed when using the leg cuff technique described by Newell et al for producing a fall in ABP.

Our Figs 1 and 2 show two typical examples in healthy volunteers. In Fig 1, an increase in signal power p following the fall of ABP with velocity v decreasing can be seen. The product FI of p and v, indicating volume flow, remains constant. In the example shown in Fig 2, v remains around 100% despite p indicating an increase in vessel caliber. Logically, FI as well increases in this case after the fall in ABP. We view this effect as attributable to an increase in the caliber of the small arteries of the MCA tree in addition to the arterial trunk.

In the abstract of Newell et al, Fig 2 is difficult to interpret. With no clinical comments given regarding carotid stenosis in the case demonstrated, it is entirely possible that there was no autoregulation in the early phase demonstrated on the graph and that the MCA velocity therefore indicates volume flow. Notice, however, that the analysis includes barely one third of a minute during which the MCA velocity and ICA flow returned to normal. Their further evolution, and whether this even included increased flow, cannot be established from the graph.

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References

Fig 1. Printout of Doppler signal analysis in a healthy volunteer examined with the transcranial Doppler leg-cuff test.
References


Response

We appreciate the comments to our abstract, which are also appropriate for the larger study published recently in Stroke.1 However, we disagree with the conclusions and speculations of Dr Muller.

Figs 1 and 2 in Dr Muller's letter indicate that readings during the autoregulatory response were taken at intervals of about 6 seconds. This choice is inadequate, as the autoregulatory response times are typically 5 seconds and may be as short as 3 seconds. Thus, the entire dynamic response may have been missed because of the infrequent sampling.

It is correct that we only showed about 20 seconds of the response. By this time the MCA velocity as well as the ICA flow had returned to control values.1 However, we would like to add that we saw no discrepancy between these parameters in the period after this interval and could find no support for Dr Muller's hypothesis that there may be a delayed dilatation of the MCA in the first minutes of the autoregulatory response to a step decrease in ABP.

We have been using a flow index method since 1986.2 Our experience with this method is that it is valid only under very specific circumstances.1 During orthostatic tests, it cannot be used because of the slight movements of probes and shifts in the position of the brain structures. Furthermore, the high-pass filtering of most instruments—including that used by Dr Muller—introduces errors because the flows below the filter levels are neglected in the result. In practice it is also difficult to achieve a sufficient signal-to-noise ratio for the method to be valid. Using our specially designed instrument to compare the Doppler flow index to the spectral outline during autoregulation,2 we never saw a power or flow index response like the one shown in Figs 1 and 2 in Dr Muller's letter.
Flow and velocity during autoregulation testing in humans.
H R Müller

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The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/25/6/1296.citation

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