In their study, Isikay et al have analyzed the influence of age and hematocrit on transcranial Doppler (TCD) parameters in two different clinical settings, i.e. acute ischemic stroke and non-vascular neurological disorders. Their chief conclusion is that changes in either age or hematocrit do not seem to modify blood flow velocities in patients with a recent ischemic stroke as much as they do in patients with other conditions. This may be of practical importance, since the assessment of cerebral hemodynamics in acute stroke is one of the main applications of TCD.

TCD is a non-invasive ultrasound technique that allows the measurement of blood flow velocities through the major basal intracranial arteries. During the last few decades, it has turned out to be quite a useful tool for the evaluation of cerebral blood flow. In addition to its non-invasive character, TCD offers the advantages of being a rapid, reproducible, dynamic, and relatively inexpensive test. In patients with cerebral ischemia, TCD can detect intracranial arterial occlusions and stenoses, as well as the hemodynamic consequences of severe extracranial arterial lesions. TCD can also recognize microembolic signals coming from cardiac or vascular sources, while contrast-enhanced TCD can provide helpful information in right-to-left cardiac or extracardiac shunts. During the acute phase of cerebral ischemia, TCD monitoring can document spontaneous or tPA-induced arterial recanalization. Moreover, its efficacy as an auxiliary technique for the selection of patients for thrombolysis is currently being explored. Therefore TCD may assist the clinician in making the diagnosis, predicting the prognosis, and selecting the best treatment choice for patients with a recent ischemic stroke.

Despite its many advantages, TCD has several limitations. Some of them are of technical nature, such as the lack of a suitable transtemporal window in a few patients, or the dependence of blood flow velocity measurements on the probe-vessel insonation angle. Besides, a number of anatomic and physiologic factors are known to influence TCD parameters, such as the age and sex of the subject, the diameter of the vessels, some cardiovascular and gasometric variables, or the hematocrit value. Though the effects of these factors may at times be ignored, taking them into account can be crucial under certain circumstances. In accordance with previous reports, Isikay et al have found a relationship of TCD velocities with age and hematocrit: in general, the higher the age or the hematocrit, the lower the velocities recorded by TCD. However, the association of TCD velocities with both variables was more remarkable in the group of patients with non-vascular neurological disorders than in those patients suffering from acute ischemic stroke; in fact, the association between TCD velocities and hematocrit did not reach a significant level within the stroke group.

The results of this study are clinically relevant. If age and hematocrit do not have a great impact on TCD velocities in acute stroke, taking them under consideration may be unnecessary in this setting. Still, further research is needed to corroborate these findings in other patient series. It would also be interesting to elucidate the pathophysiologic mechanisms that could potentially blunt the effects of age and hematocrit on blood flow velocities during acute cerebral ischemia.

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