

心臓内部の孔を発見するのに代替検査が優れている (Abstract: LB10)

卵円孔開存の患者における将来のリスクを経頭蓋ドプラにより鑑別できる可能性がある

Transcranial Doppler may differentiate future risk of stroke in patients with patent foramen ovale

一部の患者の脳卒中の原因となり得る危険な卵円孔開存症(PFO)の検出において、経頭蓋ドプラ検査—脳への血流を計測する安価な超音波法—は標準的な心エコー検査よりも感度が高い可能性があるとのlate-breaking scienceの結果が2014年American Stroke Association's International Stroke Conferenceで発表された。さらに、経頭蓋ドプラ検査によりこの異常の程度に関連した将来の脳卒中や一過性脳虚血発作(TIA)のリスクを鑑別することが可能である。過去の研究から人口の25%、および潜在性脳卒中患者において高率にPFOを有していることが示された。このシャントは血栓を右心系から左心系に逃してしまい、脳へ向かう血管内に進入し奇異性塞栓症を生じさせる。研究者らは、既に経頭蓋ドプラで検出されたPFOが、広く用いられている経食道心エコー検査においても検出されるかを検査した。心エコー検査ではPFOを有する患者340人中15%以上を検出できなかった。見逃されたPFOの約4分の1は重症度の最も高い3つであった。

Full Text

Transcranial Doppler testing — an inexpensive ultrasound tool for measuring blood flow to the brain — may be more sensitive than standard echocardiography for finding dangerous patent foramen ovale (PFO) that might underlie some patients' strokes according to late-breaking science presented at the American Stroke Association's International Stroke Conference 2014. In addition, the transcranial Doppler test could differentiate the risk of future stroke or transient ischemic attack (TIA) as related to the severity of the defect.

An echocardiogram uses ultrasound to see if bubbles injected in a vein have flowed from the right atria to the left, while the transcranial Doppler detects the bubbles in the brain arteries, said J. David Spence, M.D., senior researcher for the study and director of the Stroke Prevention & Atherosclerosis Research Centre, Robarts Research Institute at Western University in London, Ontario, Canada.

Previous research indicates that 25 percent of the population, and a higher percentage of patients who have had cryptogenic strokes, have a patent foramen ovale (PFO), which occurs when an opening between two heart chambers fails to close at birth. Many people never have symptoms. However, such a hole, or "shunt," can allow a blood clot that forms in a vein to escape from the right to the left side of the heart, enter the arteries to the brain and cause a paradoxical embolism.

Researchers tested whether PFOs already detected by transcranial Doppler would also be found by transesophageal echocardiography, a widely used approach.

Echocardiography — which included contrast dye before saline bubbles were injected — failed to find the PFO in more than 15 percent of the 340 patients in the study with the defect, the researchers reported.

Researchers did not investigate whether transcranial Doppler detected all such defects in patients with PFO found by echocardiogram.

"Surprisingly, some of those shunts were quite large," Spence said — about one-quarter of the missed defects were in the three highest grades of severity, according to a five-grade measure.

Accurately detecting PFOs, and knowing its grade, can help doctors decide whether a stroke was due to a paradoxical embolism, Spence said. Other clues related to the patient's stroke are also helpful, including shortness of breath at stroke onset; sitting for a long time, such as on an airplane; waking up with a stroke; and having a history of migraine, sleep apnea, deep vein thrombosis, varicose veins or pulmonary embolism.

Diagnosing the underlying cause of a stroke is essential to choosing the right medicine to help prevent future strokes, Spence said. Anticoagulant drugs are three times more effective than antiplatelet agents in preventing the type of stroke that can be caused by a clot passing through a PFO, he said.

The study's findings may also be important in understanding which patients with PFO might benefit from closing the hole surgically or with a catheter-deployed device. PFO is present in about one-quarter of the population but accounts for only about 5.5 percent of strokes caused by paradoxical embolism. This suggests the defect isn't a problem in about 80 percent of patients with it, Spence said. "That's why these clinical clues are so important," he said.

Compared with echocardiography, the cost of transcranial Doppler equipment is about one-fifth that of a modern echocardiogram machine; heavy sedation is not used as it typically is with transesophageal echocardiogram; and transcranial Doppler is helpful for other purposes, such as learning which patients with asymptomatic narrowing of the carotid artery may warrant surgery. "More stroke centers should be doing transcranial Doppler," Spence said.

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