Study Finds Use of Mechanical Devices as Stroke Treatment Increasing

February 25 2010

(PhysOrg.com) -- The use of mechanical devices as a treatment for acute ischemic stroke, in which a blood clot blocks the flow of blood to an artery supplying the brain, is increasing in the United States, researchers at the University of Cincinnati have found.

The finding comes at a time when two mechanical embolectomy devices—which remove or break up clots and restore blood flow via a catheter-based system—are approved for use by the U.S. Food and Drug Administration for removal of clots and reimbursed as a stroke treatment by the Centers for Medicare & Medicaid Services (CMS). They do not have FDA approval for treatment of strokes, however, because research is continuing into whether or not mechanical embolectomy actually improves outcomes.

The UC research, led by Pooja Khatri, MD, assistant professor of neurology and a member of the UC Neuroscience Institute at University Hospital, is being detailed Feb. 25, 2010, in a poster presentation at the American Stroke Association's International Stroke Conference 2010 in San Antonio.

"Mechanical embolectomy is certainly a promising therapy, and deserving of further study," Khatri says, adding that UC's stroke team is one of approximately 50 centers participating in a nationwide clinical trial investigating the effectiveness of mechanical embolectomy and other intra-arterial (IA) approaches.

Approximately 750,000 strokes occur in the United States annually, of which 85 percent are ischemic strokes. (The other 15 percent are hemorrhagic strokes, which occur when a weakened blood vessel ruptures.)

Reperfusion therapy, or restoration of blood flow, is the treatment goal for acute ischemic stroke and can be accomplished via either mechanical embolectomy or rtPA (Recombinant Tissue Plasminogen Activator), a clot-busting drug which is administered intravenously or intra-arterially. Intravenous rtPA is the only therapy approved by the FDA for the urgent treatment of ischemic stroke.

Two mechanical devices, Concentric Medical's Merci Retrieval System (a tiny corkscrew device) and Penumbra, Inc.'s Penumbra System (an aspiration device), offer an option for acute ischemic stroke patients who do not respond to rtPA or are ineligible for rtPA. Both access the arterial system through the femoral artery in the groin and are navigated to the brain using standard endovascular techniques.

Using the MEDPAR database, which consists of all patients over 65 with Medicare (excluding managed care plans) at all U.S. hospitals, the researchers compared acute ischemic stroke treatments for fiscal years 2007 and 2008. They found that of ischemic strokes treated acutely with reperfusion therapy, 8.6 percent (499 of 5,819) were treated with mechanical embolectomy devices in fiscal year 2007. That percentage rose to 11.1 (752 of 6,765) in fiscal year 2008.

Using the Premier database (patients of all ages and payor sources with a 15 percent sampling of all U.S. hospitals) for fiscal year 2008, the researchers also found that those treated with mechanical embolectomy tended to be sicker, at larger hospitals and at teaching hospitals compared with those treated with drugs alone.