
It has long been established that women have an increased risk of postpartum thrombotic events ≤6 weeks after delivery; however, little is known about thrombotic risk beyond that period. Using administrative claims data on all discharges from nonfederal emergency departments and acute care hospitals in California from 2005 to 2010, Kamel et al retrospectively assessed risk of thrombotic events (composite primary outcome of ischemic stroke, myocardial infarction, or venous thromboembolism) among individuals aged ≥12 years hospitalized for labor and delivery. Using a crossover cohort design, they assessed each individual’s likelihood of a thrombotic event during sequential 6-week periods after delivery with likelihood of an event during the corresponding 6-week period 1 year later.

Among 1,687,930 individuals, 1,015 had thrombotic events (248 strokes, 47 myocardial infarctions, and 720 venous thromboemboli) during 1-year plus ≥24-week follow-up after delivery. Compared with individuals without postpartum thrombosis, those with thrombotic events were older, more likely to be white or black than Hispanic or Asian, less often privately insured, and more likely to have risk factors for thrombosis (age >35 years, preeclampsia or eclampsia, primary hypercoagulable state, smoking, and cesarean delivery). Compared with the same period 1 year later, risk of thrombotic events was notably higher within 6 weeks after delivery (odds ratio, 10.8; 95% confidence interval, 7.8–15.1) and modestly elevated 7 to 12 weeks after delivery (odds ratio, 2.2; 95% confidence interval, 1.5–3.1). Risk of thrombotic events was not elevated in subsequent 6-week periods; however, a post hoc exploratory analyses revealed that thrombotic risk was increased 13 to 15 weeks after delivery (odds ratio, 2.0; 95% confidence interval, 1.1–3.6) but not in the 16- to 18-week period. Stroke risk was highest within 6 weeks postpartum (odds ratio, 8.5; 95% confidence interval, 4.9–14.8), but not beyond 6 weeks. These findings were consistent with prior studies showing a 3- to 9-fold increase in the risk of stroke risk 6 weeks postpartum.

This study is the first large epidemiological study to assess the likelihood of thrombotic events beyond the 6-week postpartum period. The study was well designed; non-California residents were excluded to maximize longitudinal follow-up; among women with multiple labor-related hospitalizations within a 40-week period, cases of false labor were excluded by identifying delivery as the latest hospitalization; among individuals who had >1 delivery in the study period, only the first pregnancy was captured; and individuals with preexisting history of thrombosis were excluded. The crossover cohort design minimized unmeasured confounding because each patient served as her own control. The study has the inherent limitations of administrative data sets, such as lack of detailed clinical information. In addition, because of the lack of rigorously validated International Classification of Diseases, Ninth Revision, Clinical Modification codes, cerebral venous thrombosis was not included in the primary analysis. More studies are needed to further elucidate risks and benefits of antithrombotic medications for high-risk women beyond the 6-week postpartum period.


Oral anticoagulation in individuals with atrial fibrillation (AF) and previous intracranial hemorrhage (ICH) is associated with an increased risk of recurrent ICH. Because the left atrial appendage (LAA) is the primary source of cardioembolism in the setting of nonvalvular AF, occlusion of the LAA may be a safer avenue for stroke prevention than anticoagulation for individuals with AF and a history of ICH. Horstmann et al conducted the first, explorative, prospective, single-center study to evaluate the safety and feasibility of percutaneous LAA occlusion in individuals with nonvalvular AF and previous ICH. From 2010 to 2012, 103 individuals with nonvalvular AF and prior ICH were screened for participation in the study and 20 individuals were enrolled. Exclusion criteria included age <18 years and modified Rankin Scale score >4. LAA occlusion was performed under transesophageal echocardiographic and fluoroscopic guidance. The left atrium was accessed via the right femoral vein and transseptal puncture. Intravenous heparin was administered after transseptal puncture to prevent clot formation. The Amplatzer Cardiac Plug occluder
was implanted into the LAA using a self-expanding nitinol frame. Postprocedurally individuals received aspirin 100 mg daily and clopidogrel 75 mg daily for 3 months, followed by aspirin monotherapy thereafter.

The participants’ estimated annual ischemic stroke risk was 4.0% to 6.7% based on the mean congestive heart failure, hypertension, age, diabetes, prior stroke/TIA, vascular disease, age, sex category (CHA₂DS₂-VASc) score, and annual bleeding risk on anticoagulation was 8.7% to 12.5% for major hemorrhage and 1.2% to 1.6% for ICH according to the hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalized ratio, elderly, drugs/alcohol (HAS-BLED) score.

In this case series, there were no major procedure-related complications, but 4 individuals had minor complications (2 inguinal hematomas, 1 self-limiting asystole, and 1 thrombus formation on device). No ischemic or hemorrhagic strokes occurred during the mean follow-up period of 13.6±8.2 months. This is the first study to assess the safety and feasibility of LAA occlusion in individuals with AF and history of ICH. The major limitations of the study include small sample size, lack of a comparison group, and enrollment at a single center. Nevertheless, this pilot study of LAA occlusion in patients with AF and previous ICH shows a promising potential alternative to oral anticoagulation for stroke prevention in these high-risk patients. Additional evaluation of the efficacy and safety of LAA occlusion in large, prospective, randomized controlled trials will be necessary.