Introduction: Cerebral ischemia is a potentially devastating complication of carotid endarterectomy. While extra-vascular shunts have been used for decades to minimize the impact of intraoperative cerebral ischemia, this procedure carries its own risks, including injury to the distal carotid artery predisposing to re-stenosis. Our study was undertaken to find potentially modifiable risk factors for intraoperative cerebral ischemia and need for shunting during carotid endarterectomy. Specifically, we were interested in the effect of preoperative beta-blocker use, following the findings of the POISE study in which beta-blockers started perioperatively were associated with increased risk of stroke in a variety of types of surgery.

Methods: With Institutional Ethics Committee approval, we performed a retrospective chart review of all primary carotid endarterectomies, using EEG monitoring and selective shunting, performed at our institution over a 10-year period from 2000-2010. A total of 523 charts were screened for the presence of cerebral ischemia by identifying patients requiring shunting, based on ischemic changes on EEG at the time of carotid clamping. There were 69 patients requiring shunts. The 454 non-shunted patients were randomized and 69 controls, matched for the degree of contralateral carotid occlusion and the year of surgery, were identified. Data collected for all shunt cases and their matched controls included: preoperative demographics, co-morbidities and medications, degree of carotid stenosis, perioperative management and complications for 30 days postoperatively.

Results: There were no differences between groups in baseline characteristics (age, ASA status, co-morbidities). The incidence of intraoperative ischemic EEG changes leading to shunt placement decreased by 50% over the study period (18% in 2000-2005, 9% in 2006-2010). For those requiring a shunt, there were significantly more patients taking beta-blockers compared to controls (47.8% vs. 27.5%, P=0.02, odds ratio 2.4, 95% CI 1.2-4.9). 5/69 shunted patients suffered perioperative stroke vs. 0/69 non-shunted patients.

Discussion: This study demonstrates an association between chronic beta-blocker use and cerebral ischemia with carotid clamping. However, the attribution of causation requires further exploration. As the debate around the use of perioperative beta-blockers continues, more studies will be needed to firmly determine the risk-benefit profile of these widely used medications.

2. Lancet 2008; 371: 1839–47