Chronic cerebral hypoperfusion (CCH) can result in vascular dementia and small vessel white matter ischemic injury. These findings have previously been demonstrated in a murine experimental model of CCH secondary to bilateral common carotid artery stenosis (BCAS). This study sought to elucidate the effects of CCH on recognition memory as assessed by the novel object recognition (NOR) test and histological analysis of the hippocampus and perirhinal cortex.

Studies were performed on ten-week-old male mice using bilateral 0.18 mm microcoils to narrow the carotid arteries in accordance with prior publications. Following surgery, BCAS (n = 6) and sham (n = 6) mice were evaluated using NOR and 8-arm radial maze testing paradigms. Tissue damage was assessed using H&E staining on a parallel cohort of mice (n = 6 BCAS, n = 7 sham).

In the NOR paradigm, BCAS mice demonstrated significant deficits in short-term memory. Consistent with prior studies, BCAS mice also performed significantly worse on 8-arm radial maze testing. BCAS mice exhibited significantly more neuronal injury in the perirhinal cortex when compared to sham-operated mice. However, no significant differences in neuronal damage were observed in the CA1 region of the hippocampus.

Experimental CCH secondary to BCAS results in recognition memory deficits on NOR testing. Damage to the perirhinal cortex, rather than to the hippocampus, may underlie this impairment [1)].

1)
Patel A, Moalem A, Cheng H, Babadjouni RM, Patel K, Hodis DM, Chandegara D, Cen S, He S, Liu Q, Mack WJ. Chronic cerebral hypoperfusion induced by bilateral carotid artery stenosis causes selective recognition impairment in adult mice. Neurol Res. 2017 Aug 22:1-8. doi: 10.1080/01616412.2017.1355423. [Epub ahead of print] PubMed PMID: 28828966.