Background: Silent cerebral embolization, detected at transcranial Doppler (TCD) monitoring as microembolic signals (MES), is common during diagnostic coronary angiography (DCA). MES rate depends on degree of intracatheter vascular calcification. When using Judkins catheters, right transradial approach (RTA) showed higher rate of MES compared to left transradial and transfemoral, as a consequence of higher rate of catheter exchanges due to difficult navigation and manipulation through tortuous innominate arteries. Microembolization is more common in the right cerebral hemisphere, according to origin of right common carotid artery from innominate artery. A single catheter fitting both coronaries (Optitorque Tiger, Terumo, Japan) is available and could reduce the embolization rate. Our aim was to compare cerebral embolization of single (SC) vs double catheters (DC) strategy during DCA performed through RTA.

Methods: 19 patients with suspected coronary artery disease were submitted to DCA via RTA after randomization to single (Optitorque Tiger, n=9) or double (Judkins Left and Right, n=10) catheter strategy, with contemporaneous bilateral TCD monitoring to detect a 50% reduction of MES.

Results: Less catheters were employed in SC compared to DC group (1.1±0.3 vs 2.1±0.3, p<0.0001) with similar procedural success rate (88% vs 90%, p=0.9), MES were detected in all patients, with a significant lower rate in SC group (median 30, interquartile range [IQR] 16-45, vs 57 IQR 54-69, p=0.0001), especially during catheter change (19 IQR 11-25 vs 41 IQR 27-49, p=0.003), whereas no difference was detected during contrast injections (5 IQR 1-13 vs 9 IQR 5.7-17, p=0.24) and coronary ostia engagement (2.1 IQR 1-6 vs 8 IQR 1-11, p=0.15). A strong negative correlation exists among number of MES and SC strategy (Spearman’s Rho=-0.78, p<0.0001); at multivariate linear regression analysis the use of a single catheter reduced incidence of MES of 50% (B=−30,6, standard error (SE)=-7, beta=−0.71, t=-4.95, IC -46/-15, p=0.001, constant=-61).

Conclusions: Risk of silent brain injury during DCA is strongly related to number of catheters employed. A specifically designed diagnostic catheter for both coronary arteries via RTA reduced dramatically this embolic risk.