The roles of microRNAs in atherosclerosis and stroke

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The gene program is controlled at the post-transcriptional level by the action of small non-coding RNAs known as microRNAs (miRNAs), short, single-stranded molecules that control mRNA stability or translational repression via base pairing with regions in the 3' untranslated region of their target mRNAs. Over the last decade, considerable progress has been made to elucidate the roles of miRNAs in vascular pathogenesis and develop the use of miRNAs as biomarkers and as innovative drugs. We have recently shown that miR-126 and miR-223 are implicated in the course of chronic kidney disease (CKD) and are associated with vascular calcifications and atherosclerosis in murine aorta. As alterations of cerebral circulation were linked with an increase in ischemic stroke and behavioral trouble in CKD, we have also shown that miR-17 and miR-126 are deregulated in endothelial cells from cerebral arterioles in murine models of CKD. Finally, in a human cohort, carotid plaques were divided between symptomatic and asymptomatic patients according to the presence or absence of stroke. Seven miRNAs were significantly overexpressed in symptomatic versus asymptomatic plaques. Moreover, the expression of miR-125a was significantly correlated to the level of circulating LDL-cholesterol in symptomatic patients. The miRNAs are thus potential non-invasive biomarkers to target high-risk groups of embolic stroke among patients with carotid stenosis. In conclusion, miRNAs could play a role in CKD vascular remodelling and may therefore represent useful targets to prevent or treat vascular complications of CKD.

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Is acute reperfusion therapy safe in acute ischemic stroke patients who harbor unruptured intracranial aneurysm?

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Background: Intracranial aneurysms (ICAs) are currently considered as contraindication for intravenous (IV) thrombolysis in acute ischemic stroke (AIS), very likely due to a hypothetical increase in the risk of bleeding from aneurysm rupture; however, there is limited data available on whether IV thrombolysis is unsafe for AIS patients with pre-existing ICAs.

Aim: To find out the safety of IV thrombolysis in AIS patients who harbor ICAs.

Methods: We retrospectively reviewed the medical records and cerebrovascular images of all the patients treated with IV thrombolysis for AIS in our center from the beginning of 2006 till the end of April 2014. Those with unruptured ICA present on cerebrovascular images prior to acute reperfusion therapy were identified. Post thrombolysis brain imaging were reviewed to evaluate for any intraparenchymal or subarachnoid hemorrhage related or unrelated to the aneurysm.

Results: A total of 637 patients received IV thrombolysis for AIS in our center during 8.3 years period. Thirty three (5.1%) were found to have at least one ICA, twenty three (70%) of those received only IV thrombolysis and 10 patients has received combination of IV and intra-arterial (IA) thrombolysis. The size of the largest aneurysm was 10 mm in maximum diameter (Range: 2 mm to 10 mm). No symptomatic intracranial hemorrhage (sICH) occurred among the 23 patients receiving only IV thrombolysis. Out of those who received a combination of IV and IA thrombolysis, 1 developed sICH in the location of acute infarct, distant to the aneurysm location.

Conclusion: Our findings suggest that neither IV thrombolysis nor combination of IV and IA thrombolysis increase the risk of aneurysmal hemorrhage in AIS patients who harbor ICAs less than 10 mm in diameter. Their listing in exclusion criteria for IV thrombolysis should be reconsidered to assure appropriate use of acute reperfusion therapy in this group of patients.

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