Safety and tolerability of Ultrasound Contrast Agents in patients with middle cerebral artery occlusion treated with endovenous thrombolysis and mechanical thrombectomy

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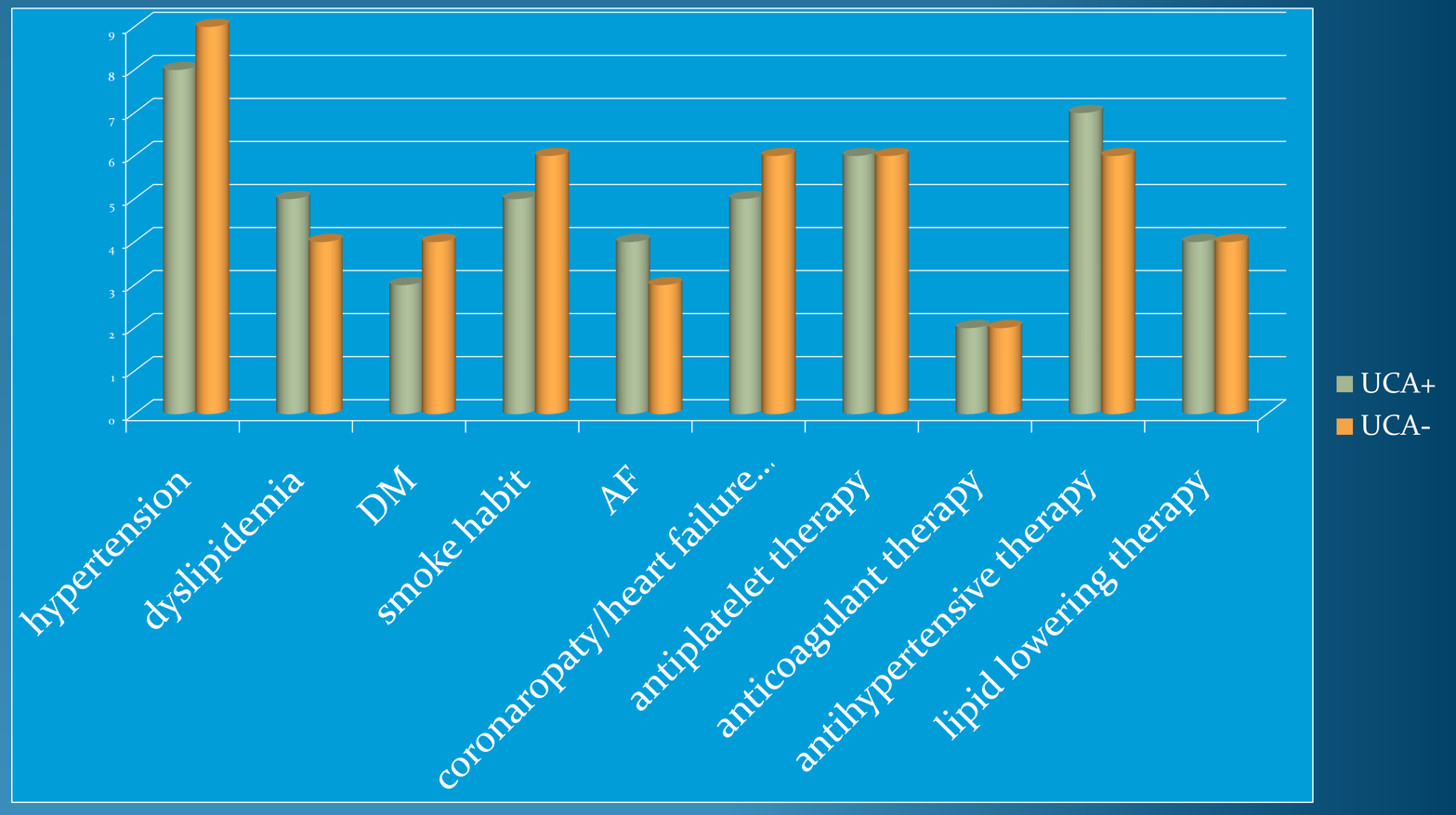
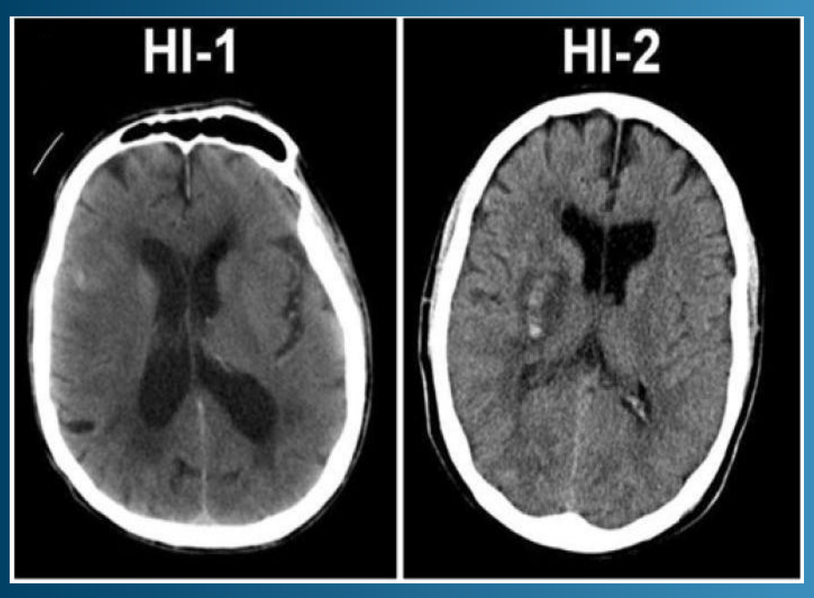
Background. According to recent updates in the european guidelines,in patients with acute ischemic stroke due to anterior large artery occlusion the assessment of intracranial vessels should be performed with non-invasive imaging techniques such as Transcranial colour-coded duplex sonography (TCCS) before considering combined treatment with endovenous thrombolysis and mechanical. thrombectomy. TCCS study can be difficult in patients with insufficient temporal bone windows, but visualization of intracranial circulation can be improved by using of echo contrast agents (SonoVue), although there are limited data on patients with acute stroke who underwent concomitant treatment with rtPA and thrombectomy after Sonovue injection. Aim of our study was to assess the tolerability and safety of echo contrast injection in the acute phase evaluation of patients with ischemic stroke due to anterior circulation occlusion treated with endovenous thrombolysis and mechanical thrombectomy.

Methods. Among all patients admitted to our Stroke Unit from 2013, we enrolled 11 consecutive patients (5 males, 6 females) with a an acute ischemic stroke due to proximal middle cerebral artery (MCA) occlusion documented by TCCS assessment with Sonovue injection who underwent to endovenous thrombolysis (Alteplase) and mechanical thrombectomy A control group of 11 gender/age matched patients with MCA occlusion who underwent to the same clinical pathway without echo contrast agent usage were recruited.Every patient underwent to control TCCS assessment after endovascular procedure, baseline and control neuroimaging (CT scan and/or Brain MRI) at 24 h and at 7 days. Classification of cerebral hemorrhages was carried out according to ECASS classification. Clinical data and past medical history were recorded.

Results. Mean age of patients was 72.6 7.9 years, mean NIHSS at symptoms onset and distribution of risk factors for cerebral hemorrhage were not significantly different between the two study groups. Hemorrhagic transformation of ischemic lesions was detected in one patients who underwent Echocontrast administration (HI2) and in two patients of the control group (one HI1 and one HI2) at 24 h neuroimaging control.
Sonovue injection was well tolerated in all patients, no allergic reactions or significant changes in vital parameters were reported.





	UCAs +	UCAs-
HI 1	1	1
HI 2	0	1
PH1	0	0
PH2	0	0
PHR1	0	0
PHR2	0	0
Total	1	2

Intracerebral haemorrhage, ICH - To be classified according to the following definitions:	
HI 1	Small petechiae along the margins of the infarct
HI 2	A more confluent petechiae within the infarct area but without space-occupying effect
PH 1	Blood clot(s) not exceeding 30% of the infarct area with some mild space-occupying effect
PH 2	Blood clots exceeding 30% of the infarct area with significant space occupying effect
PHr 1	Small or medium sized blood clots located remote from the actual infarct; a mild space occupying effect could be present
PHr 2	Large confluent dense blood clots in an area remote from the actual infarct; significant space occupying effect may be present

Conclusions. According to our results, the administration of echo contrast injection is safe in patients with acute ischemic stroke treated with endovenous thrombolysis and mechanical thrombectomy; Sonovue could be used to ameliorate the diagnostic accuracy of TCCS examination in these settings without enhancing the risk of hemorrhage.