Intracranial bleeding under dual antiplatelet therapy after emergency recanalization of intracranial and extracranial large artery occlusion

Yael Yannick Zdunczyk¹,
Oliver Beuing², Stephan Hause¹,
Jens Neumann¹, Andrea Breja¹,
Stefanie Schreiber¹, H.-Jochen
Heinze^{1,3}, Anja Lenz², Martin Skalej²,
Michael Goertler^{1,3}
Vascular and Stroke Center
University of Magdeburg
¹Department of Neurology
²Department of Neuroradiology
³Leibniz Institute for Neurobiology
yael.zdunczyk@med.ovgu.de

Background

To assess bleeding risk of (stent-protected) angioplasty (PTA) of extracranial internal carotid (ICA) occlusion with subsequent dual antiplatelet agents in addition to intracranial endovascular thrombectomy in acute anterior circulation stroke.

Methods

Between 2009 and 2017, 515 consecutive patients admitted to our university stroke center with an acute severe anterior circulation stroke underwent endovascular thrombectomy for intracranial large artery occlusion. Stroke severity was assessed by the NIHSS score at admission. Admission CT was rated according to ASPECTS and controlled after 24 hours, 4 days, and in case of patients' clinical worsening. Functional outcome was evaluated after 3 months by the modified Rankin scale (unfavorable outcome, 3 to 6).

Results

70 of 515 patients (13.6%) underwent additional PTA for extracranial ICA occlusion/pseudo-occlusion. PTA was stent-protected in 37 patients because of ulcerative or thrombogenic ICA plaque or insufficient dilatation for thrombectomy-catheter passage by sole PTA. 39 patients received early (within 24 hours) dual antiplatelet agents, i.e. ticagrelor in 28 and clopidogrel in 11 in addition to ASA. In nine patients, clopidogrel was administered as add on to ASA at day 2 to day 7. Patients' characteristics and interventional data are presented in table 1. Six patients suffered spontaneous symptomatic intracerebral bleeding (table 2). Chi-square test revealed an association of early dual antiplatelet prevention after (stent-protected) PTA and spontaneous symptomatic intracerebral bleeding ($P=0.03$). However, as all 6 bleedings occurred in the 28 patients with early ticagrelor in addition to ASA ($P=0.003$) and none in the 11 patients with early clopidogrel (figure), our data may not suggest an increased risk under the combination of ASA and clopidogrel. Bleeding was not associated with an unfavorable outcome, seen in 52 patients (74.3%). No bleeding association was found for intravenous and intraarterial thrombolysis and ASPECTS at admission.

Conclusions

Ticagrelor in addition to ASA within 24 hours of intracranial thrombectomy and extracranial (stent-protected) PTA in acute stroke from extra-intracranial tandem occlusion may be associated with an increased risk of spontaneous symptomatic intracerebral bleeding.

Tab. 1 Patients' characteristics and endovascular intervention

Age, years (mean, SD)	65.1 (11.3)
Men	48 (68.6%)
Atrial fibrillation	11 (15.7%)
NIHSS-Score at admission (median, IQR)	19 (12-23)
ASPECTS (median, IQR)	8.5 (8-10)
Intravenous thrombolysis	38 (54.3%)
General anesthesia	43 (61.4%)
Event to groin-puncture time, hours (mean, SD)	5.09 (3.3)
Extracranial stent-PTA	37 (52.9%)
Local arterial thrombolysis	20 (28.6%)
Intracranial aspiration (without stent retriever)	41 (58.6%)
Early dual antiplatelets (ASA & ticagrelor/clopidogrel)	39 (55.7%)

Tab. 2 Outcome variables

Spontaneous symptomatic intracerebral bleeding	6 (8.6%)
Modified Rankin score after 90 days unfavorable (≥ 3)	52 (74.3%)
Mortality after 90 days	8 (11.4%)

Figure Early dual antiplatelet therapy and symptomatic intracerebral bleeding