Cerebral Ischemia in Patients on Non-Vitamin-K-Dependent Oral Anticoagulants: Through Plasma-Levels on Admission are Associated with Stroke Severity

Kosmas Macha1, MD; Armin Marsch1, MD; Gabriela Siedler, MD; Stefan Schwab, MD; Bernd Kallmünzer, MD; 1Authors contributed equally
Department of Neurology, University of Erlangen-Nuremberg, Erlangen, Germany

Background: Non-Vitamin-K-dependent oral anticoagulants (NOAC) are increasingly common in primary and secondary prevention of ischemic stroke. If an ischemic stroke occurs under NOAC-therapy, the severity and clinical course might be affected by the quality of anticoagulation at the time of stroke onset, but clinical data are limited.

Methods: Data from our prospective observational registry including all patients admitted with acute cerebral ischemia while taking oral anticoagulants - LVO (Large Vessel Occlusion, 139 patients) - from November 2014 and October 2017 were investigated. Functional through plasma-levels of NOAC on admission were associated with plasma-levels low, intermediate and high.

Results: Of 234 patients treated with NOAC on admission, functional through plasma-levels were available in 177 subjects (75.6%).

Plasma-levels were found to be low in 49 (27.7%), intermediate in 41 (23.2%), and high in 87 patients (49.2%). Patient groups were similar for relevant demographic parameters. Patients with low plasma-levels had significantly higher scores on the NIHSS-scale on admission (median 8 (IQR 3-15) vs. 4 (1-11) vs. 3 (0-8); p=0.005) and had a higher risk of persisting neurologic deficits or higher odds of major complications (54.0%); p<0.001). In addition, occlusion of a large cerebral vessel was more frequent with low plasma-levels (23 (46.9%) vs. 9 (22.0%) vs. 13 (14.9%); p<0.001).

Patients with large vessel occlusion (LVO) (n=45) on admission were younger (median 77.0 years (IQR 75.2-83.0) vs. 81.0 (77.0-86.0); p=0.003), had a better renal function (normal renal function on admission 68.9% vs. 49.2%; p=0.023), and presented earlier to the hospital than patients without large vessel occlusion (within 4.5 hours post symptom onset 66.7% vs. 43.5%; p=0.008 / within 12 hours post symptom onset 100.0% vs. 90.9%; p=0.038).

In patients presenting with LVO through plasma-levels on admission were more often categorized low (51.1% vs. 19.7%; p<0.001) and less often categorized high (28.9% vs. 56.1%; p=0.002) compared to patients without LVO.

In multivariable logistic regression analyses low plasma-level was independently associated with higher odds of LVO on admission (3.84 (95% CI 1.80-8.20); p=0.001).

Conclusion: Through plasma-levels of NOAC on admission were independently associated with stroke severity. Low NOAC-plasma-levels on admission were independently associated with higher odds of large vessel occlusion on admission.