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Retrospective cohort study shows much lower rates of intracranial hemorrhage due to minor head injury in patients on new oral anticoagulants

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Background :

Several clinical rules have been developed to detect patients in whom intracranial hemorrhage (ICH) may be ruled out without the need of a computer tomography (CT) scan following minor head injury (MHI). While all these decision rules and guidelines recognize anticoagulant therapy as a risk factor for intracranial bleeding, they do not differentiate between vitamin K antagonists (VKA) and direct oral anticoagulants (NOAC). In fact, very few studies have analyzed the performances of VKAs and NOACs in the setting of minor head injury, and the results have so far been inconclusive due to small study sizes and heterogeneous definition of MHI.

Patients & Methods :

In this retrospective cohort study, we analyze admissions for minor head injury (Glasgow Coma Scale, GCS ≥ 14) at the Emergency Department of Hospital S. Matteo in Pavia. The objective is to assess whether patients treated with NOACs have different morbidity and mortality compared with patients taking VKAs, antiplatelet drugs, or no relevant therapy.

Each enrolled patient is classified according to therapy, presence of ICH on CT scan or readmission within 30 days, and various other clinical and anamnestic parameters, also taken with the purpose of running internal performance analyses. A secondary severity outcome is defined as the need of neurosurgical intervention or death.

We excluded patients on parenteral anticoagulants or on double antiaggregant therapy, as well as patients presenting again for the same traumatic episode, patients presenting having already performed a CT scan for the episode, and patients with insufficient data for cohort attribution.

We trained a logistic regression model to measure the entity and significance of the differences in ICH prevalence between the NOAC cohorts and the three others, taking into account other possible risk factors.

Results & discussion :

1480 patients were enrolled in our study. Of these, 103 were being treated with a VKA, 51 with a NOAC, 316 with an antiplatelet drug, while 1010 took no anticlotting therapy. 129 of these patients were diagnosed with ICH. As seen in fig. 1, the ICH rate in the VKA group (18%) was significantly higher than what measured in the NOAC group (2%, adjusted odds ratio: 10.8, p=0.02).

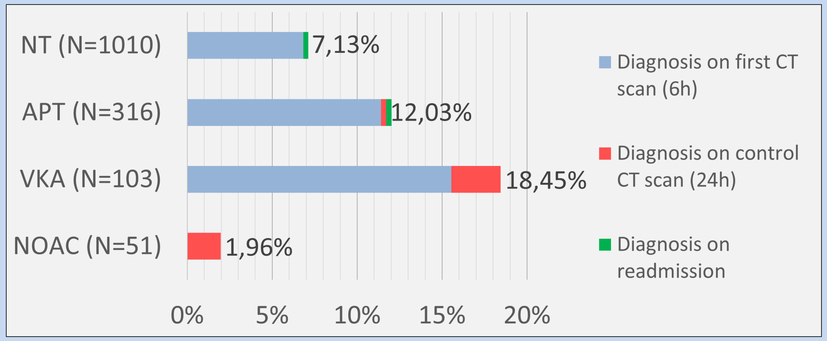

Figure 1: prevalence of ICH in the four cohorts, subdivided by timing of diagnosis. NT: no relevant therapy, APT: antiplatelet therapy, VKA: Vitamin K Antagonists, NOAC: novel/direct oral anticoagulants, CT: computer tomography

Logistic regression analysis: predictors of ICH (NOAC cohort omitted, as reference)		
	Odds Ratio	p value
Control group	7.2	> 0.05
Antiplatelet therapy	6.4	> 0.05
Vitamin K antagonists	**10.8**	**0.022**
High-risk mechanism	4.0	< 0.001
Age (OR per year)	1.03	< 0.001

Table 1: logistic regression model comparing the three other treatment cohorts to the NOAC cohort

No other statistically significant differences were found between the four treatment cohorts.
Collection of secondary outcome data was unfortunately still ongoing at the time of submission.

Conclusion & perspectives :

In line with the few similar studies published on the matter, our study also underlines the improved safety profile demonstrated by the new anticoagulants in the field of minor head trauma. To date, we manage this group of patients in the same way we manage patients on VKAs: a 24 h observation period followed by a control CT scan. If our results are confirmed by the secondary outcome analyses and reproduced by subsequent studies, they could have important consequences for the development of dedicated diagnostic algorithms for patients on NOACs.

Acknowledgements :