Anticoagulant Related Intracerebral Hemorrhage Diagnosis

Computerized tomography (CT) remains the initial neuroimaging tool of choice for acute Intracranial Hemorrhage Diagnosis [1].

The presence of a blood-fluid level has been suggested as a marker for Anticoagulant Related Intracerebral Hemorrhage [2] [3], but with the exception of one study (a sub-study of INTERACT 2), most published studies are case reports or were done on small samples [4] [5]

In a study of 2065 patients from the INTERACT-2 study, blood-fluid levels on baseline CT (found in 19 patients in the sample) were associated with the use of warfarin as well as poor outcome 90 days after ICH [6].

In 855 patients with CT-confirmed acute ICH scanned within 48 h of symptom onset, Almarzouki et al. investigated the sensitivity and specificity of the presence of a CT-defined blood-fluid level (rated blinded to anticoagulant status) for identifying concomitant anticoagulant use. They also investigated the association of the presence of a blood-fluid level with six-month case fatality. Eighteen patients (2.1%) had a blood-fluid level identified on CT; of those with a blood-fluid level, 15 (83.3%) were taking anticoagulants. The specificity of the blood-fluid level for OAC-ICH was 99.4%; the sensitivity was 4.2%. They could not detect an association between the presence of a blood-fluid level and an increased risk of death at six months (OR = 1.21, 95% CI 0.28-3.88, p = 0.769). The presence of a blood-fluid level should alert clinicians to the possibility of OAC-ICH, but the absence of a blood-fluid level is not useful in excluding OAC-ICH [7].

References

[1]
Heit JJ, Iv M, Wintermark M. Imaging of Intracranial Hemorrhage. J Stroke. 2017 Jan;19(1):11-27. doi: 10.5853/jos.2016.00563. Epub 2016 Dec 12. PMID: 28030895; PMCID: PMC5307932.

[2], [4]
Pfleger MJ, Hardee EP, Contant CF Jr, Hayman LA. Sensitivity and specificity of fluid-blood levels for coagulopathy in acute intracerebral hematomas. AJNR Am J Neuroradiol. 1994 Feb;15(2):217-23. PMID: 8192064.

[3]
Gökçe E, Beyhan M, Acu B. Evaluation of Oral Anticoagulant-Associated Intracranial Parenchymal Hematomas Using CT Findings. Clin Neuroradiol. 2015 Jun;25(2):151-9. doi: 10.1007/s00062-014-0292-8. Epub 2014 Jan 29. PMID: 24474263.

[5]
Qureshi AI, Palesch YY, Barsan WG, Hanley DF, Hsu CY, Martin RL, Moy CS, Silbergleit R, Steiner T, Suarez JI, Toyoda K, Wang Y, Yamamoto H, Yoon BW; ATACH-2 Trial Investigators and the Neurological Emergency Treatment Trials Network. Intensive Blood-Pressure Lowering in Patients with Acute Cerebral Hemorrhage. N Engl J Med. 2016 Sep 15;375(11):1033-43. doi: 10.1056/NEJMoa1603460. Epub 2016 Jun 8. PMID: 27276234; PMCID: PMC5345109.

[6]
Sato S, Delcourt C, Zhang S, Arima H, Heeley E, Zheng D, Al-Shahi Salman R, Stapf C, Tzourio C,

Robinson T, Lindley RI, Chalmers J, Anderson CS; INTERACT2 Investigators. Determinants and Prognostic Significance of Hematoma Sedimentation Levels in Acute Intracerebral Hemorrhage. Cerebrovasc Dis. 2016;41(1-2):80-6. doi: 10.1159/000442532. Epub 2015 Dec 16. PMID: 26671408.
7)

Almarzouki A, Wilson D, Ambler G, Shakeshaft C, Cohen H, Yousry T, Al-Shahi Salman R, Lip GYH, Houlden H, Brown MM, Muir KW, Jäger HR, Werring DJ. Sensitivity and specificity of blood-fluid levels for oral anticoagulant-associated intracerebral hemorrhage. Sci Rep. 2020 Sep 23;10(1):15529. doi: 10.1038/s41598-020-72504-7. Erratum in: Sci Rep. 2021 Apr 28;11(1):9485. PMID: 32968133; PMCID: PMC7511300.