Q19 Head Injuries in Older Adults

Which *one* of the following is *not* a risk factor for traumatic intracranial hemorrhage in patients 65 years or older presenting in the emergency department for a ground-level fall-related head injury?

- ❍ 1. Focal neurologic signs
- ❍ 2. External signs of head trauma
- ❍ 3. Male sex
- ❍ 4. Oral anticoagulant use

Educational Point: Traumatic brain injuries are prevalent in individuals aged 65 years and over, and between 53% and 89% of these trauma are related to ground-level falls in this population. Between 17% and 41% of older adults sustaining a ground-level fall and attending the emergency department (ED) present with a head trauma. In addition, ED visits for head injuries in this population have already risen disproportionately: in some high-income countries, this increase has been 244% in 10 years. The increase in ED use for ground-level falls is also associated with a significant rise in the number of hospital admissions. This trend is also associated with a significant increase in resource use, such as computed tomography (CT) imaging.

Identifying older patients with traumatic intracranial hemorrhage (ICH) can be challenging. Clinical decision rules to guide imaging decisions were not specifically designed or validated for older adults, leading to uncertain diagnostic performances. Furthermore, recent studies aimed at identifying the risk factors for traumatic ICH in this population are heterogeneous. Some indicate that direct oral anticoagulants (DOACs) are not associated with an increased risk of traumatic ICH in this population. Others suggest that antiplatelets use may be associated with a slight increase in the risk of traumatic ICH. Furthermore, the initial clinical assessment of older adults presenting to the ED after a fall may be more complex, as nearly 30% of this group experience cognitive impairment, and half of the falls occur without a witness, making the history potentially unreliable.

This may partly explain the overexposure of this population to head imaging, despite the prevalence of traumatic ICH at 5.2%, with fewer than 1% requiring neurosurgical intervention.

This systematic review and meta-analysis aimed to identify the risk factors associated with traumatic ICH in older ED patients who sustained a ground-level fall. It further examined the prevalence of urgent neurosurgical intervention, hospital admission, and in-hospital mortality in this population.

A total of 17 observational studies involving 22,520 patients were included in this systematic review with meta-analysis. The studies' eligibility criteria included patients aged 65 years and over who consulted in an emergency department following a ground-level fall-related head trauma and who presented with a Glasgow Coma Scale score of at least 13. Seven were prospective (11,501 individuals), and 8 were multicenter studies (14,376 individuals). The prevalence of traumatic ICH was 6.8% (95% confidence interval [CI]: 6.5 to 7.2), occurring in 1,538 patients. Among patients with traumatic ICH, urgent neurosurgery intervention prevalence was 8.0% (95% CI: 5.0 to 12.0). The unadjusted ORs indicate that the risk factors of traumatic ICH were suspected open or depressed skull fracture (OR: 10.9 [95% CI 6.4 to 18.7]), signs of basal skull fracture (OR: 4.7 [95% CI 3.4 to 6.5]), reduced baseline Glasgow Coma Scale score (OR: 4.0 [95% CI 3.4 to 4.7]), focal neurologic signs (OR: 3.8 [95% CI 3.2 to 4.5]), seizure (OR: 3.2, [95% CI 1.5 to 7.0]), vomiting (OR: 2.7 [95% CI 2.1 to 3.5]), amnesia (OR: 2.4 [95% CI 2.0 to 3.0]), loss of consciousness (OR: 2.3 [95% CI 1.9 to 2.8]), headache (OR: 2.1 [95% CI 1.6 to 2.9]), external sign of head trauma.

Based on AOR, only focal neurologic signs (AOR: 4.4 [95% CI 3.0 to 6.5]), external sign of head trauma (AOR: 2.7 [95% CI 2.1 to 3.5]), loss of consciousness (AOR: 1.6 [95% CI 1.2 to 2.1]), and male sex (AOR: 1.4 [95% CI 1.2 to 1.6]) remained associated with traumatic ICH. Preinjury anticoagulant was not a significant risk factor (OR: 0.8 [95% CI 0.7 to 1.0]; vitamin K antagonist (OR: 1.0 [95% CI 0.8 to 1.4]) and direct oral anticoagulant (DOAC) (OR: 0.8 [95% CI 0.6 to 1.0])).

The findings in this study require prospective assessment as it cannot be concluded on the basis of this study that in the absence of statistically significant risk factors, head CT or hospital admission can be safely avoided.

The correct answer is 4.