

Comparison of bleeding risk scores in patients with atrial fibrillation and cancer

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Background. Cancer may increase bleeding risk in atrial fibrillation (AF), but the association between cancer type and specific bleeding events has been scarcely investigated. Furthermore, the performance of bleeding risk scores in this high-risk subgroup of patients is unclear.

Purpose. To describe the incidence rate (IR) of major (MB), gastrointestinal (GI) bleeding and intracranial haemorrhage (ICH) according to cancer types. We also investigated the performance of HAS-BLED, ATRIA and ORBIT scores.

Methods: Observational retrospective cohort study including 399,344 patients with AF and cancer.

Results. Mean age was 77.9 ± 10.2 years and 63.2% were men. During 2.0 years follow-up, the IR of MB was as high as 8.41%/y, GI bleeding was 3.61%/y and ICH 1.33%/y. MBs were more frequent in liver (12.68%/y), leukaemia (12.39%/y), pancreas (11.71%/y), bladder (11.67%/y) and myeloma (11.64%/y). GI bleedings were highest in liver (7.54%/y), pancreas (7.42%/y) and gastric (5.51%/y). ICH was highest in leukaemia (1.89%/y), myeloma (1.52%/y), lymphoma/liver (1.45%/y) and pancreas (1.41%/y) cancer.

The Table shows the hazard ratio and AUC values for each bleeding score. All the three scores significantly associated with bleeding outcomes, with the HAS-BLED score performing better than others for ICH prediction, and the ORBIT score predicting MB and GI bleedings ($p < 0.0001$ for all AUC comparisons).

Conclusions. Cancer increases the risk of bleeding in patients with cancer, with specific differences according to each cancer type. HAS-BLED score showed the best predictive value for ICH and the ORBIT score for MB and GI bleeding.

	MB	GI bleeding	ICH
Hazard Ratio (95%CI)			
HASBLED score \geq 3	6.575 (6.390-6.765)	5.735 (5.502-5.978)	5.803 (5.416-6.218)
ATRIA score \geq 5	5.372 (5.241-5.506)	3.617 (3.499-3.739)	1.469 (1.403-1.538)
ORBIT score \geq 4	13.326 (12.977-13.686)	7.453 (7.202-7.712)	2.578 (2.463-2.699)
AUC (95%CI)			
HASBLED score \geq 3	0.716 (0.714-0.718)	0.702 (0.699-0.704)	0.698 (0.694-0.702)
ATRIA score \geq 5	0.700 (0.698-0.702)	0.662 (0.659-0.665)	0.563 (0.557-0.568)
ORBIT score \geq 4	0.805 (0.804-0.807)	0.756 (0.753-0.758)	0.641 (0.635-0.646)
AUC Difference (95% CI)			
HASBLED \geq 3 vs ATRIA \geq 5	0.016 (0.014-0.018)	0.040 (0.037-0.042)	0.136 (0.133-0.138)
HASBLED \geq 3 vs ORBIT \geq 4	-0.089 (-0.091--0.087)	-0.054 (-0.056--0.052)	0.057 (0.055-0.059)
ATRIA \geq 5 vs ORBIT \geq 4	-0.106 (-0.108--0.104)	-0.094 (-0.095--0.092)	-0.078 (-0.080--0.076)