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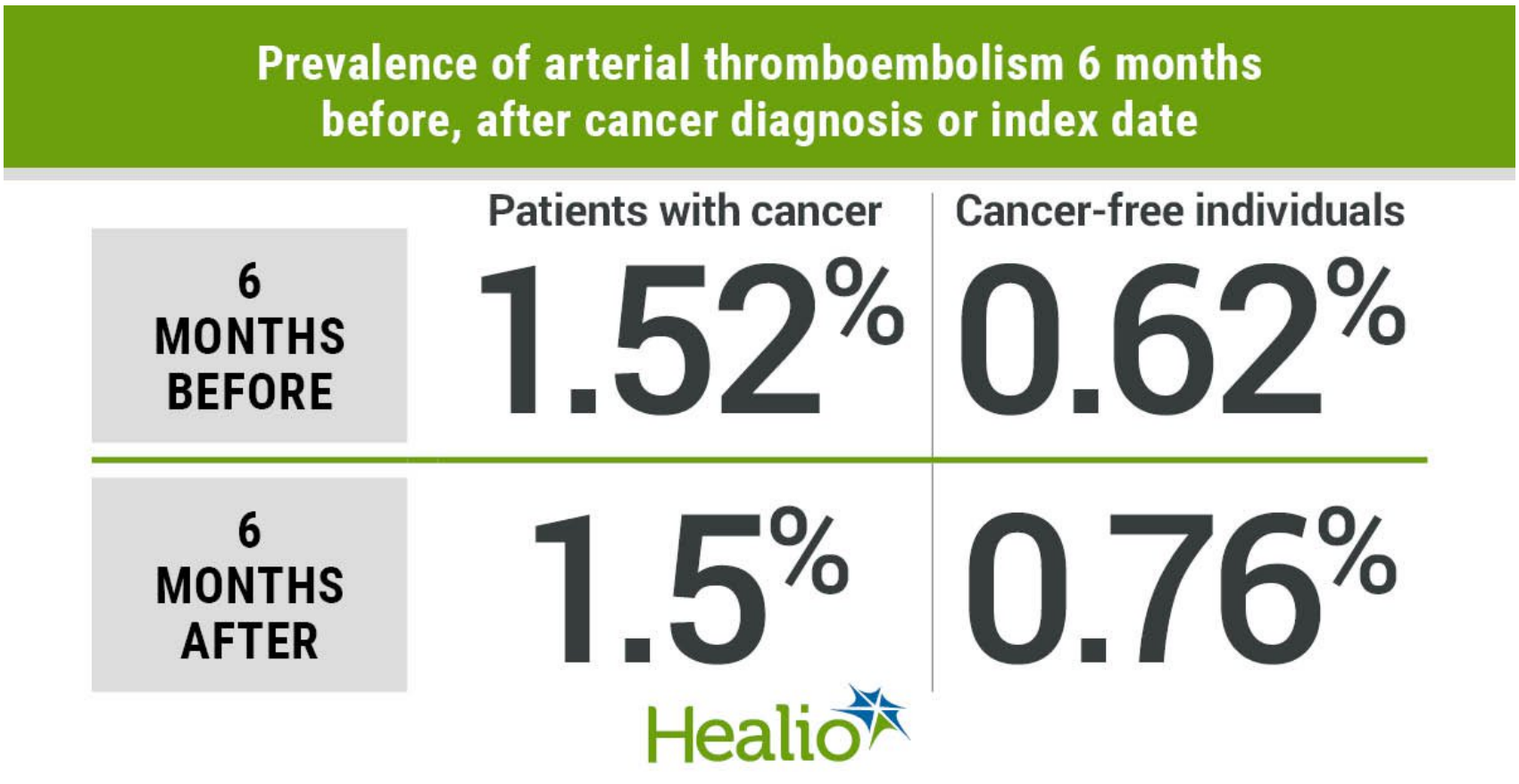
Patients with cancer at higher risk for arterial thromboembolic events

Patients with cancer appeared at increased risk for arterial thromboembolism and mortality within 1 year of cancer diagnosis compared with the general population, according to an epidemiological analysis published in *JACC: CardioOncology*.

"It is well-known that [patients with cancer] are at increased risk for venous thromboembolism. Less is known of arterial thrombosis, which consists of ischemic stroke, myocardial infarction and peripheral arterial occlusion," **Frits I. Mulder, MD,** researcher in the department of vascular medicine at Amsterdam Cardiovascular Sciences at Amsterdam University Medical Center, told Healio. "We therefore aimed to estimate this risk in the real-world data of the Danish registries, which contain health outcomes for all Danish patients with cancer."



Data were derived from Mulder FI, et al. *J Am Coll Cardiol CardioOnc*. 2021;doi:10.1016/j.jaccao.2021.02.007.

Mulder and colleagues used the registries to compare risk for arterial thromboembolism among 458,462 patients with cancer (median age, 69 years; 51% women), diagnosed between 1997 and 2017, with that of 1,375,386 cancer-free individuals from the general population with comparable baseline characteristics.


Frits I. Mulder

Researchers used a competing-risk approach to compute cumulative incidences, and subdistribution HRs and Cox regression to calculate cause-specific HRs. They estimated mortality risk among patients with cancer in a Cox regression analysis with arterial thromboembolism as a time-varying exposure.

Primary or secondary inpatient diagnosis of arterial thromboembolism served as the study's primary outcome.

Median follow-up was 1 year.

During the 6 months before cancer diagnosis or the index date, patients with cancer had a higher prevalence of arterial thromboembolism than cancer-free individuals (1.52% vs. 0.62%; prevalence ratio, 2.4; 95% CI, 2.32-2.48). Patients with cancer also had a higher cumulative incidence of arterial thromboembolic events than the comparison group during the 6 months after cancer diagnosis or the index date (1.5% vs. 0.76%; HR = 2.36; 95% CI, 2.28-2.44).

For the entire 1-year study period, cumulative incidence was 2.11% (95% CI, 2.06-2.15) among those with cancer vs. 1.48% (95% CI, 1.46-1.5) among cancer-free individuals (HR = 1.87; 95% CI, 1.82-1.92).

Risk for arterial thromboembolism differed substantially according to cancer type. Data showed cumulative incidence within 6 months after cancer diagnosis was highest among patients with bladder cancer (2.49%; 95% CI, 2.25-2.74), lung cancer (2.08%; 95% CI, 1.98-2.18) and colon cancer (2.08%; 95% CI, 1.96-2.21) and lowest among patients with breast cancer (0.58%; 95% CI, 0.54-0.64).

Moreover, cumulative incidence of arterial thromboembolism appeared to increase with advancing age among patients with cancer, with 6-month rates of 0.79% (95% CI, 0.74-0.83) among those aged younger than 65 years, 1.61% (95% CI, 1.55-1.67) among those aged 65 to 75 years and 2.3% (95% CI, 2.22-2.38) among those aged older than 75 years.

Further analysis showed patients with cancer had a higher 1-year cumulative incidence of myocardial infarction (0.75% vs. 0.6%; HR = 1.66; 95% CI, 1.59-1.73) and of ischemic and unspecified stroke (1.22% vs. 0.85%; HR = 1.89; 95% CI, 1.82-1.96) than cancer-free individuals.

Predictors for arterial thrombotic events among patients with cancer included male sex (adjusted subdistribution HR [sHR] = 1.15; 95% CI, 1.08-1.22), having a prior history of arterial thromboembolism (adjusted sHR = 2.96; 95% CI, 2.77-3.17), distant metastasis (adjusted sHR = 1.21; 95% CI, 1.12-1.3) and receipt of chemotherapy within the first 4 months after cancer diagnosis (adjusted sHR = 1.47; 95% CI, 1.33-1.61).

The occurrence of arterial thromboembolic events also appeared associated with a higher risk for mortality among patients with cancer (HR = 3.28; 95% CI, 3.18-3.38).

“The risk for arterial thromboembolism is more than twofold higher among patients with cancer compared with the general population. The risk is highest around cancer diagnosis and is especially increased among men, elderly patients and those with lung and bladder cancers,” Mulder said. “Our study underscores the fact that oncologists should be aware of arterial thromboembolism in their patients and preventive measures could be considered among those at high risk.”

Future research will aim to develop risk scores for arterial thromboembolism in patients with cancer, he told Healio.

“Several risk scores exist to predict VTE in patients with cancer, and international guidelines now recommend prescribing thromboprophylaxis for this population of patients with a high risk score,” Mulder said. “Potentially, a similar score for arterial thromboembolism could help clinicians to identify those individuals who should be selected for screening, preventive measures or a more individualized approach for cancer treatment.”

The strengths of this epidemiological analysis include use of a comprehensive Danish population-based registry, according to an accompanying editorial by **Katherine S. Panageas, DrPH,** associate attending biostatistician, and **Lisa M. DeAngelis, MD,** a neuro-oncologist, physician-in-chief and chief medical officer, both at Memorial Sloan Kettering Cancer Center.

"Mulder and colleagues applied rigorous analytic methods that accounted for the competing risk for death and treated arterial thromboembolic events as a time-dependent covariate," Panageas and DeAngelis wrote. "Although these data are retrospective, rely on administrative diagnosis codes and lack granular patient-specific information, including laboratory and imaging results, they can inform improvement of care for the newly diagnosed [patient with cancer]. These findings, along with other recent reports, raise the question whether a patient diagnosed with cancer should be considered for primary prevention of cardiovascular disease."

For more information:

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References:

Mulder FI, et al. *J Am Coll Cardiol CardioOnc*. 2021; doi:10.1016/j.jaccao.2021.02.007.

Panageas KS and DeAngelis LM. *J Am Coll Cardiol CardioOnc*. 2021;doi:10.1016/j.jaccao.2021.03.004.

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