Long-term risk of pulmonary embolism and deep venous thrombosis after COVID-19: a population-based cohort study

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Background: Venous thromboembolism (VTE) (pulmonary embolism (PE) or deep venous thrombosis (DVT)) is common during acute COVID-19. Long-term excess risk has not yet been established.

Objective: To study long-term VTE risk after COVID-19.

Methods: Swedish citizens aged 18-84 years, hospitalized and/or testing positive for COVID-19 between January 1, 2020, and September 11, 2021 (exposed), stratified by initial hospitalization, were compared to matched (1:5) non-exposed population-derived subjects without COVID-19. Outcomes were incident VTE, PE or DVT recorded at <60, 60−<180, and ≥180 days.

Results: Among exposed patients, 48,861 were hospitalized for COVID-19 (mean age 60.6 years) and 894,121 were without hospitalization (mean age 41.4 years) with 2,380 (4.9%) and 718 (0.08%) cases of VTE <60 days, compared to 142 (0.06%) and 1,033 (0.02%) among non-exposed controls (244,242 and 4,468,411, respectively). Among patients hospitalized for COVID-19, adjusted hazard ratios (HRs) during 60−<180 days were 6.05 (95% confidence interval (CI) 4.80−7.62) for PE and 3.97 (CI 2.96−5.33) for DVT, compared to non-exposed with corresponding estimates among COVID-19 without hospitalization 1.17 (CI 1.01−1.35) and 0.99 (CI 0.86−1.15), based on 475 and 2,311 VTE events, respectively. Long-term (≥180 days) HRs in patients hospitalized for COVID-19 were 2.01 (CI 1.51−2.68) for PE and 1.46 (CI 1.05−2.01) for DVT while non-hospitalized had similar risk to non-exposed, based on 467 and 2,030 VTE events, respectively.

Conclusions: Patients hospitalized for COVID-19 retained an elevated excess risk of VTE, mainly PE, after 180 days, while long-term risk of VTE in individuals with COVID-19 without hospitalization was similar to the non-exposed.