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

H. Sjoland1, M. Lindgren1, T. Toska1, P.O. Hansson1, K. Glise Sandblad1, L. Bjorck1, C.E. Lundberg2, M. Adiels3, A. Rosengren1

1Sahlgrenska Academy, Gothenburg, Sweden
2University of Gothenburg, Department of Food and Nutrition, and Sport Science, Gothenburg, Sweden
3University of Gothenburg, School of Public Health and Community Medicine, Gothenburg, Sweden

Funding Acknowledgements: Type of funding sources: Public grant(s) – National budget only. Main funding source(s): Swedish Heart and Lung Foundation Swedish Research Council

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.