

ORIGINAL ARTICLE

Diagnosis of Pulmonary Embolism with D-Dimer Adjusted to Clinical Probability

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ABSTRACT

BACKGROUND

Retrospective analyses suggest that pulmonary embolism is ruled out by a D-dimer level of less than 1000 ng per milliliter in patients with a low clinical pretest probability (C-PTP) and by a D-dimer level of less than 500 ng per milliliter in patients with a moderate C-PTP.

METHODS

We performed a prospective study in which pulmonary embolism was considered to be ruled out without further testing in outpatients with a low C-PTP and a D-dimer level of less than 1000 ng per milliliter or with a moderate C-PTP and a D-dimer level of less than 500 ng per milliliter. All other patients underwent chest imaging (usually computed tomographic pulmonary angiography). If pulmonary embolism was not diagnosed, patients did not receive anticoagulant therapy. All patients were followed for 3 months to detect venous thromboembolism.

RESULTS

A total of 2017 patients were enrolled and evaluated, of whom 7.4% had pulmonary embolism on initial diagnostic testing. Of the 1325 patients who had a low C-PTP (1285 patients) or moderate C-PTP (40 patients) and a negative D-dimer test (i.e., <1000 or <500 ng per milliliter, respectively), none had venous thromboembolism during follow-up (95% confidence interval [CI], 0.00 to 0.29%). These included 315 patients who had a low C-PTP and a D-dimer level of 500 to 999 ng per milliliter (95% CI, 0.00 to 1.20%). Of all 1863 patients who did not receive a diagnosis of pulmonary embolism initially and did not receive anticoagulant therapy, 1 patient (0.05%; 95% CI, 0.01 to 0.30) had venous thromboembolism. Our diagnostic strategy resulted in the use of chest imaging in 34.3% of patients, whereas a strategy in which pulmonary embolism is considered to be ruled out with a low C-PTP and a D-dimer level of less than 500 ng per milliliter would result in the use of chest imaging in 51.9% (difference, -17.6 percentage points; 95% CI, -19.2 to -15.9).

CONCLUSIONS

A combination of a low C-PTP and a D-dimer level of less than 1000 ng per milliliter identified a group of patients at low risk for pulmonary embolism during follow-up. (Funded by the Canadian Institutes of Health Research and others; PEGeD ClinicalTrials.gov number, NCT02483442.)

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*Lists of the PEGeD study investigators and committee members are provided in the Supplementary Appendix, available at NEJM.org.

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