

RESEARCH TITLE: COMBINED PATIENT CHARACTERISTICS AND D-DIMER LEVELS AS PREDICTORS OF PULMONARY EMBOLISM IN A KENYAN TERTIARY HOSPITAL

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ABSTRACT

Background

Pulmonary embolism continues to be a significant contributor to cardiovascular morbidity and mortality globally, including in our setting. Diagnosis is complicated by its variable clinical presentation. Clinical prediction models and biomarkers such as D-dimer are commonly used to guide diagnosis; however, their utility in local settings remains under-evaluated.

Objective

This study evaluated clinical and sociodemographic characteristics, in conjunction with D-dimer levels, that could be used as predictors of Pulmonary embolism at the Mater Misericordiae Hospital (MMH), Kenya.

Methodology

This cross-sectional research involved 73 patients exhibiting clinical signs indicative of pulmonary embolism, all of whom underwent computed tomography pulmonary angiography and D-dimer testing during their initial assessment. Data were collected via a structured questionnaire. To assess the relationships between patient characteristics and the occurrence of pulmonary embolism, both bivariate and multivariable logistic regression analyses were conducted. Furthermore, the correlation between age-adjusted D-dimer levels and verified cases of pulmonary embolism was examined using STATA version 16.

Results

A total of 73 patients with suspected pulmonary embolism (PE) were included, with a mean age skewed toward older adults; 56.2% were aged above 50 years, and 54.8% were female. Most patients (71.2%) resided in high-altitude regions.

The most common presenting symptoms were dyspnea (65.8%), tachypnea (54.8%), cough (50.7%), and pleuritic chest pain (47.9%). Elevated D-dimer levels (>1000 ng/mL) were observed in 71.2% of patients. Hypertension (50.7%) and type 2 diabetes mellitus (30.1%) were the most frequent comorbidities.

CT pulmonary angiography confirmed PE in 29 patients, giving a prevalence of 39.7% (95% CI: 29.0–51.5). On bivariate analysis, cough was significantly associated with lower odds of PE (uOR 0.33, 95% CI: 0.12–0.88, $p=0.027$). Other variables, including age, sex, comorbidities, and clinical features, were not significantly associated with PE, although malignancy and recent surgery showed non-significant trends toward increased risk. In multivariable logistic regression, no independent predictors of PE were identified.

There was a significant association between age-adjusted D-dimer levels and PE diagnosis ($p=0.006$). No PE cases were observed among patients with D-dimer levels of 0–500 ng/mL, whereas the prevalence increased to 33.3% in the 500–1000 ng/mL group and 50.0% in those with levels above 1000 ng/mL.

Conclusion

Pulmonary embolism was found to be relatively common among patients evaluated for suspected disease. Although most clinical features did not independently predict its presence, higher D-dimer levels were strongly

associated with confirmed cases. These findings support the continued use of D-dimer as a key screening tool and highlight the need for improved risk stratification models in this setting.