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A reflection on our day-to-day clinical practice: can we increase the predictability of pulmonary embolism (PE) by combining D-dimer with other biochemical variables and CXR findings?

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Aims

PE can be quite difficult to diagnose. It is relatively common and can be fatal without adequate treatment. As per NICE guideline on the management of patients with suspected PE, where patients are considered to be of lower risks for PE based on the Wells score, D-dimer can be used to stratify patients. Positivity of D-dimer subsequently influences decision on radiological imaging (CTPA/VQ). In a real-life clinical setting, there appears to be a wide variation in clinicians' interpretation of D-dimer values in the context of PE. Apart from D-dimer, other biochemical variables including CRP, WCC, neutrophils:lymphocytes and CXR findings are often included as part of the initial investigations. This study aimed to assess the diagnostic value of these variables and its influence on predictability of PE.

Methods

A retrospective, single institutional analysis (Scarborough General Hospital). Consecutive patients who underwent CTPA for suspected PE, between January 2013 and January 2014, were identified via IMPAX and included in the study if they also had D-dimer and other biochemical profiles requested. Formal reports of CTPA by local radiologists were used in the diagnosis of PE. Multivariate analysis (binary logistic regression), using SPSS v20, was used to create a model and to assess which of the variables significantly predict PE.

Results

In total, 193 patients who underwent CTPA were included, of whom 40 had PE (20.7%). Where CTPA showed no evidence of PE, other causes of raised D-dimer were identified including heart failure, pneumonia, pericardial effusion, pleural effusion. Higher magnitudes of D-dimer were associated with increased probability of PE. There was a positive correlation between CRP and D-dimer ($r = 0.33$, $p<0.001$). No specific pattern was seen in WCC in PE, and WCC has limited statistical influence on predictability of PE. Similarly, CXR had limited contribution to predictability in PE diagnosis. Based on multivariate analysis, after controlling the effects of other variables, only D-dimer significantly predicted PE.

Conclusions

In the diagnosis of PE, D-dimer remained the current best parameter. Multiple multivariate regression models were examined, and addition of CRP, WCC or CXR findings to D-dimer had little significance to the prediction model of PE. ■

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