DIAGNOSTIC CONSIDERATION IN CASES OF PULMONARY EMBOLISM MIMICKING ACUTE CORONARY SYNDROME: IS ELECTROCARDIOGRAPHY A FRIEND OR A FOE?

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ABSTRACT

Objectives: As the clinical presentations of pulmonary embolism (PE) closely mimic that of acute coronary syndrome (ACS), the purpose of this brief report is to study the effect of adding an electrocardiography tracing (ECG) suggestive of ACS on the diagnostic consideration of PE with chest pain presentation. Methods: Twenty final year medical students and 31 house officers randomized to one of two cases of PE patients presented with clinical and ECG suggestive of ACS. Each of these two cases was divided further into either with ECG tracing attached or without. Results: More participants without ECG attached had considered PE as a differential diagnosis vs those provided with ECG (8 out of 25, 32% vs. 6 out of 26, 23% respectively, p=0.48). Specifically for the first case, the consideration of PE as a differential diagnosis was significantly higher when ECG was not attached compared to when it was attached (4 out of 13 or 30.8% vs. 0 out of 14, p = 0.04). Conclusion: In cases where the clinical signs and symptoms mimic that of an ACS, performing an ECG with features mimicking ACS may not only be unhelpful, but may paradoxically deter consideration of PE.

Key words: Acute coronary syndrome, diagnosis, electrocardiography, pulmonary embolism

INTRODUCTION

Due to its non-specific signs and symptoms, the diagnosis of pulmonary embolism (PE) often remains elusive and can be particularly challenging even to the most astute clinicians (Lucassen *et al*., 2011; Raja *et al*., 2015). In a report by the Emergency Medicine Pulmonary Embolism in the Real World Registry (EMPEROR) in 2011 (Pollack *et al*., 2011), it was found that the four most common presenting signs and symptoms of PE to the emergency departments (ED) were non-specific: dyspnea at rest (50%), pleuritic chest pain (39%), dyspnea with exertion (27%) and extremity swelling suggestive of deep vein thrombosis (24%). In fact, PE patients may even present with typical anginal chest pain, mimicking acute coronary syndrome,

possibly due to right ventricular ischemia (Konstantinides *et al*., 2014).

Nonetheless, while its individual signs, symptoms and diagnostic tests may be limited in their diagnostic sensitivity and specificity, it has been pointed out the combination of these clinical data, evaluated either in the form of the clinician's gestalt (defined as the clinician's unstructured clinical probability estimate after collecting routine clinical data) (Lucassen *et al*., 2011), or in the form of clinical prediction rules, are useful in classifying suspected PE patients into different categories of pre-test probability (Konstantinides *et al*., 2014). The irony is, however, some of these clinical prediction rules have actually incorporated the clinician's gestalt as part of the criteria. For example, one of the most widely used pre-test clinical prediction rules for PE, i.e., the Wells rule, has this item "is an alternative diagnosis less likely than PE" as one of its criteria (Wells *et al*., 2000). In other

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