

Is ECG an Aid to Differentiate Pulmonary Embolism from ACS?

To the Editor,

We read the article by Ambesh *et al.*^[1] which highlights electrocardiographic constraints/limitations to distinguish pulmonary embolism (PE) from acute coronary syndrome (ACS) in emergencies. We would like to mention the usefulness of negative T waves in the inferior and precordial leads, as well as ST-segment deviation (STDV) (elevation and/or depression) in the differentiation of PE from ACS with the help of bedside ECG.

Negative T waves in the inferior and precordial leads are often recognized in patients with acute coronary syndromes (ACS). However, one should remember and look for the appearance of negative T waves in patients with acute pulmonary embolism (PE) which have been suggested as a marker of right ventricular strain or right ventricular dysfunction.^[2] Kosuge *et al.*^[2] compared ECGs of patients with ACS and PE, and reported that an RV strain pattern with negative T waves in leads III and V1 in combination with negative T waves in precordial leads were seen in only 1% of patients with ACS when compared with 88% of acute PE with a sensitivity of 88% and specificity of 97%. These ECG abnormalities contribute to significant component of the 21- point ECG score by Daniel *et al.*^[3] with up to 15 points being assigned based on the presence and depth of negative T wave in leads V1-V3. In short, negative T waves in leads III, V1 and V2 are common in patients with PE.

ST-segment deviation (STDV) (elevation and/or depression) is another common ECG manifestation of PE, even though ST-segment depression (STD) is not included in Daniel's 21- point ECG score. However, several studies have described potential prognostic value associated with this STDV in the setting of acute PE rather than chronic PE.^[4]

Ischemic ECG patterns, though commonly seen in PE invariably cause emergency physicians and practitioners to often diagnose ACS and then proceed to handle the case as per protocol.^[5] Hence, it is suggested to consider acute PE based on the negative T waves in the inferior and precordial leads, and to avoid over diagnosis leading to unwanted medical investigations and treatment even in resource limited environment. Hence, the emergency physicians and practitioners—while facing clinical challenges of ACS—have to read and interpret ECG with the keen idea of excluding or differentiating ACS from PE and decide accordingly from the point of patient safety and quality of care. In other words, the more we think of PE, the more we are likely to diagnose these cases and provide them with appropriate care.

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Conflicts of interest

There are no conflicts of interest.

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