Limitations of ECG in Diagnosing Pulmonary Embolism

To the Editor:

In the article “The ECG in Pulmonary Embolism” by Ferrari et al (March 1997),1 the authors report their experience with the use of ECG in monitoring the workouts of patients with pulmonary embolism (PE). They found that the pattern of inverted T waves in the anterior precordial leads is the most frequent ECG sign in PE patients and the best index of massive PE, being associated with an angiographic Miller index >50% and a mean pulmonary arterial pressure >30 mm Hg. Other ECG signs are reported with variable frequencies, often strikingly different from those reported in other papers,2,4 eg, sinus tachycardia is rated just at 26%. Although this paper has the undoubted merit of refocusing the role of the ECG in the complex diagnostic process of PE, some limitations should be considered.

First, the authors do not stress the most important role of ECG in PE, ie, the capability of raising the suspicion of this condition or reinforcing clinical suspicion.3 To this end, most ECG abnormalities, even those totally nonspecific, such as sinus tachycardia or S-T depression, should deserve particular attention when no definite coronary heart disease or other cardiac disorder can be diagnosed. Indeed, such signs have a high prevalence (about 50%) in all the patients referred with the suspicion of PE, and their frequency remains high in patients with confirmed PE without underlying cardiopulmonary disease.3 In addition, the presence of S-T wave depression is also associated with the severity of PE.3 Therefore, the presence of the above two ECG signs, along with a few others (ie, late R wave in aVR, P-R displacement, Sshurred and T inversion in right precordial leads, S1Q3T3) that are less frequent in all the patients with PE suspicion but still are significantly more frequent in those with confirmed PE, should always raise the suspicion of PE and prompt the pertinent diagnostic workout.

Secondly, the series of patients reported is affected by a remarkable selection bias: the PE population has an unusually high incidence of massive PE, as underlined in the editorial by Moser.5 Indirectly, this is confirmed by the high frequency of McGinn-White sign, 50% in their patients, whereas it is just 16% in our series of 145 consecutive patients with confirmed PE.5 Our patients came from various hospital departments (including the surgical ones) and presented with a continuous spectrum of PE severity (the number of unperfused lung segments was normally distributed), the mean obstruction of pulmonary perfusion being around 50% of the total.5

Finally, the authors do not state explicitly that the most important conclusion of their paper, that “the anterior subepicardial ischemic pattern is closely related to the initial severity of PE,” had been previously reported,6 not just suspected. We had shown an association between the presence of T wave inversion in right precordial leads and the number of unperfused lung segments on perfusion lung scan (p<0.05) and that, also very importantly, this ECG sign was significantly less frequent at recovery from PE when the scan showed a significant perfusion improvement.7 Perhaps, our data should have been reported in Table 1.

Stefano Petruzzelli, MD, PhD
Antonio Palla, MD
Carlo Giuntini MD, FCCP
CNR Institute of Clinical Physiology
Pisa, Italy

References
2 UPET. Clinical and electrocardiographic observations. Circulation 1973; 47:60-65
5 Moser KM. New and old questions about acute venous thromboembolism. Chest 1997; 111:531-32

To the Editor:

Thank you for offering me an opportunity to respond to the letter from Petruzzelli et al, concerning our paper published in CHEST (March 1997).1

As we repeated several times in our article, we did not attempt to study the diagnostic usefulness of ECG in pulmonary embolism (PE) as much as its usefulness as a predictor of severity in PE that has already been diagnosed elsewhere. Similarly, the fact that the PE patients were selected from a cardiology ward does not constitute a “remarkable selection bias” in as far as this was the population that was targeted in the aim of the study. These patients in fact formed a specific group and reflected a clinical reality. Last, regarding the study cited,8 I think that pulmonary angiography remains the “gold standard” for evaluating severity in cases of PE, and that a correlation between the ECG signs and scintigraphic signs cannot be as reliable as when the reference adopted is the accepted standard.

Emile Ferrari, MD
Hôpital Pasteur
Nice, France

Corticosteroid Therapy and Relapse in Sarcoidosis

To the Editor:

Despite reading this very interesting article by Gottlieb et al (March 1997)1 with great care four times, I (and perhaps others as well) remain puzzled by a number of points that I hope the authors can resolve.

1. The proportion (65%) of patients who were judged to require corticosteroid therapy (CST) because of symptoms is unusually high. In a population-based study of this disease,2 in which African-Americans constituted 27%, only 25% received CST despite the employment of less stringent indications (other than symptoms) in some instances (eg, failure to resolve radiographic abnormalities or physiologic or radiographic progression). What were the sources for these the patients? Was there a tertiary referral screen such that the population under study might have been adversely selected?8
2. The ratio of females to males in the Caucasian subjects was