Letter to Editor

Pulmonary artery computed tomographic angiographies performed on women of reproductive age

Hasan Baki Altınsoy[1], Mustafa Sabak[2], Murat Taşdemir[3], Mustafa Boğan[3]

[1]Consultant, Department of Radiology, Yalova State Hospital, Yalova, [2]Consultant, Department of Emergency, School of Medicine, Gaziantep University, [3]Consultant, Department of Emergency, School of Medicine, Düzce University, Turkey

We read with interest an article [1] that described a retrospective analysis of the CTPA (computed tomographic pulmonary angiography) findings in women of reproductive age. The authors looked at the results of 100 women of reproductive age who had normal chest X-rays but were suspected of having pulmonary embolisms (PE). Only 15% of patients were found to have PE. In 8% (n=8) of cases, there were warning signs that necessitated immediate action or inpatient monitoring. One percent (n=1) of them had pneumomediastinum, and seven percent (n=7) of them had lower respiratory tract infections. Based on these results, the authors suggested using less radiation-intensive methods for reproductive- age women with suspected PE, who have normal chest X-ray findings. We've looked over these conclusions and, while we concur with the suggestions, would like to highlight some crucial points. Evidence suggests that PE is responsible for 5–15% of all hospital deaths [2,3]. It is known that a negative D-dimer value in suspected cases excludes PE with a high degree of certainty [1-3]. The fact that CTPA is the gold standard method in the industry is also recognized [4].

In this case series, we examined CTPA claims from the emergency department that were submitted between 2013 and 2018. Female patients of reproductive age between the ages of 16 and 50 with normal chest X-ray results were the subject of a retrospective analysis. In total, we found 48 female patients who met these criteria. The variables examined included age, Wells score risk groups, D-dimer levels, the presence of PE in CTPA scans, and other findings. The patients were divided into two groups: PE positive and PE negative. Additional findings other than PE were categorized into three groups:

1. Findings requiring urgent intervention: Pneumonia, malignant airway obstruction, pneumothorax, hemothorax, pneumomediastinum, massive pleural effusion.
2. Findings not requiring urgent intervention: nonspecific morning opacities, pulmonary nodules, lymph nodes, moderate pleural effusion, pleural thickening or calcification, emphysema, limited consolidations, linear or dependent density increase, air cysts.
3. No additional findings.

PE was found in a total of 5 (10.4%) patients. Of these patients, one had PE in the bilateral inferior subsegmental arteries, two had PE in the bilateral main pulmonary arteries, one had PE in the right main pulmonary artery, and one had PE in the left main pulmonary artery. When additional findings other than PE were examined, one (2%) patient had a finding that required urgent intervention, 35 (73%) patients had findings that did not require urgent intervention, and 17 (35.4%) patients had multiple additional findings. All patients diagnosed with PE also had additional findings other than PE. Neither PE nor other additional findings were detected in 12 (25%) patients (Table 1).

In this series, 12 (25%) patients had neither a PE nor an additional CTPA finding, indicating a completely normal result. These patients, who were both negative on chest x-ray and CTPA, had mean D-dimer values of 2.13 ± 2.02 mg/l (0.1–5.94). It is known that increased D-dimer levels have a high sensitivity but low specificity for thrombotic events [5,6].

In the study by Wells *et al*. of 99 patients with high D-dimer levels, 85 (85.6%) did not have DVT [7]. Due to the unreliability of D-dimer levels alone, the importance of clinical prediction scores has increased. In this series, Wells' clinical prediction scoring was used before patients underwent CTPA, and CTPA was performed in intermediate- and high-risk patients.

Although Chest X-ray is one of the most important diagnostic tests in clinical examinations, serious pathologies may still be missed. Even if PE is not detected in CTPA requested to rule out PE, it can provide valuable information for differential diagnosis. In this study, findings other than PE were detected in 75% of cases, but only 2% (n=1) of these findings required urgent intervention. On the other hand, as seen in the above examples, there are PE -negative CTPA series that reach up to 90% despite the existence of clinical scoring systems [8,9]. Genetic variations

Access this article online	
Received - 30 May 2023 Initial Review - 07 June 2023 Accepted - 30 July 2023	Quick Response code
DOI: 10.32677/yjm.v2i2.4081	

Correspondence to: Mustafa Boğan, Department of Emergency, School of Medicine, Düzce University, Turkey. E-mail: mustafabogan@hotmail.com

Table 1: Clinical characteristics of the patients involved in this case series

Parameter	Number (%)/ mean±SD (range)
Age (mean±SD [range])	33.42±8.11 years (17–45)
D-dimer (mean±SD [range])	1.76±1.72 mg/l (0.11–5.98)
Pulmonary embolism presence	
Positive	5 (10.4)
Negative	43 (89.6)
Additional findings	
Findings requiring urgent intervention	1 (2)
Findings not requiring urgent intervention	35 (73)
No additional findings	12 (25)
Additional findings (PE-negative patients)	
Ground-glass opacity	13 (27.4)
Normal findings	12 ((25)
Dependent density	6 (12.5)
Consolidation	8 (16.6)
Mild pleural effusion	6 (12.5)
Atelectasis	6 (12.5)
Lymph node	4 (8.3)
Pleural thickening	3 (6.2)
Pulmonary nodule	2 (4.2)
Subpleural air cyst	2 (4.2)
Linear density	2 (4.2)
Paratracheal cyst	1 (2)
Emphysema	1 (2)
Pulmonary vascular width	1 (2)
Pneumonia	1 (2)

SD: Standard deviation, PE: Pulmonary embolisms

in DNA repair mechanisms are thought to increase susceptibility to breast cancer after radiation exposure [8,9]. This susceptibility is thought to be influenced by breast tissue density in women of reproductive age [10,11]. According to one study, normal visualization of the right ventricle on echocardiography and normal venous Doppler of the lower extremities rule out PE with an accuracy of 96% [12].

Based on the data discussed above, we concluded that the use of diagnostic techniques with lower radiation exposure should be considered when the patient's condition is stable, particularly in female patients with a family history of low-risk factors and low-risk scores at clinical prediction or when no pathologies other than PE are suspected. Moreover, we believe that examining such patients with bilateral lower extremity venous Doppler and echocardiography would minimize radiation exposure.

AUTHORS' CONTRIBUTIONS

All authors contributed to the completion of this work. The final manuscript was read and approved by all authors.

REFERENCES

1. Champion N, Hogan S, Flemming J. Assessing the prevalence of incidental findings identified by CTPA in women of reproductive age. Emerg Med Int 2018;2018:4630945.
2. Arseven O. Akut pulmoner embolizm. In: Türktaş H, Ekim N, editors. Göğüs Hastalıkları Acilleri. Ankara: Bilimsel Tıp Yayınevi; 2000. p. 247-65.
3. Alotaibi GS, Wu C, Senthilselvan A, *et al*. Secular trends in incidence and mortality of acute venous thromboembolism: The AB-VTE population-based study. Am J Med 2016;129:879.e19-25.
4. Karalezli A. Pulmonary embolism. Güncel Göğüs Hastalık Ser 2018;6:16-35.
5. Goodacre S, Sampson FC, Sutton AJ, *et al*. Variation in the diagnostic performance of D-dimer for suspected deep vein thrombosis. QJM 2005;98:513-27.
6. Brown MD, Lau J, Nelson RD, *et al*. Turbidimetric D-dimer test in the diagnosis of pulmonary embolism: A metaanalysis. Clin Chem 2003;49:1846-53.
7. Wells PS, Anderson DR, Rodger M, *et al*. Evaluation of D-dimer in the diagnosis of suspected deep-vein thrombosis. N Engl J Med 2003;349:1227-35.
8. Hu JJ, Smith TR, Miller MS, *et al*. Genetic regulation of ionizing radiation sensitivity and breast cancer risk. Environ Mol Mutagen 2002;39:208-15.
9. Grant EJ, Cologne JB, Sharp GB, *et al*. Bioavailable serum estradiol may alter radiation risk of postmenopausal breast cancer: A nested case-control study. Int J Radiat Biol 2018;94:97-105.
10. Hassan NH, Ali RM. Determination of contributing environmental factors to breast cancer in women: A retrospective study in Babylon governorate. Karbala J Med 2017;10:2687-94.
11. Franasiak JM, Scott RT. Demographics of cancer in the reproductive age female. In: Cancer and Fertility. Cham: Humana Press; 2016. p. 11-9.
12. Konstantinides SV, Meyer G, Becattini C, *et al*. 2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS). Eur Heart J 2020;41:543-603.

Funding: None; Conflicts of Interest: None Stated.

How to cite this article: Altınsoy HB, Sabak M, Taşdemir M, *et al*. Pulmonary artery computed tomographic angiographies performed on women of reproductive age. Yemen J Med. 2023;2(2):118-119.