DOES THE ELEVATION OF D-dimer ALWAYS MEAN VTE?

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BACKGROUND

VTE is the leading cause of morbidity and mortality among hospitalized patients. Several factors influence the sensitivity and specificity of D-dimer testing, including the extent of thrombosis and fibrinolytic activity, duration of symptoms, anticoagulant therapy, comorbidities resulting from surgical or medical illnesses, inflammatory diseases, cancer, advanced age, pregnancy, the postpartum period, and a history of previous VTE. A typical D-dimer level is less than 0.50 mg/L. The D-dimer test is highly sensitive (>95%) in acute deep venous thrombosis or pulmonary embolism, usually with a cut-off value of 500 µg FEU/l, which reasonably rules out acute VTE. Upon presentation, patients with high D-dimer levels may warrant a more intensive diagnostic approach, regardless of pretest probability.
We present here a case of an 84-year-old male who suffered from pneumonia and significantly elevated d-dimer levels, but with no evidence of DVT or PE.

OBJECTIVES

We aimed to investigate the relationship between elevated d-dimer levels and evidence of VTE, including DVT or PE.

THE CASE

An 84-year-old male, a non-smoker and with no alcohol consumption, with a history of asthma, diabetes, lipidemia, and hypertension, was admitted to the ER with coughing, nasal congestion, mild pain on the right lateral side of the chest, worsening on inspiration, difficulty in breathing, and low-grade fever. No other symptoms. Other systems were normal.
List of medications taken:
Aspirin 81 mg daily
Calcium 600-D: 1, BID
Carvedilol 12.5 mg per day
CoQ-10 200 mg once daily
Crestor 5 mg per day
Fiasp
Fiber capsules, 2, BID
Fish oil capsule: 1 per day
Flaxseed oil 1 capsule, QD
Jardiance: 25 mg per day
Magnesium 400 mg, QD
Multivitamin: once a day
Nexium 20 mg
Novolog: 30 IU per day
Plavix 75 mg per day
Tresiba: 14 IU per day
Vitamin C 100 mg
Vitamin D 5000 IU
Wixela (fluticasone 250/salmeterol 50):
1 spray twice a day
Zetia: 10 mg per day
History: Nothing significant

CLINICAL FINDINGS

Upon examination, the following findings were found:
- Temp 100 degrees F
- SpO2: 97
- COVID-19 and RSV: negative
- Leukocytosis: WBC Count: 9.5
- ECG: Normal, with NSR
- Elevated d-dimer 1395 ng/ml (threshold for age 80: 800 ng/ml)
- CT Angiography chest with IV contrast: No PE (Figure 1)
- TTE: No DVT (Figure 2)

Temp 98.2, BP 154/65, pulse 75, Resp 20, SpO2 97, all other organs normal, Elevated d-Dimer 1395
Serum creatinine (1.28), HS Troponin 77, BNP 165, Procalcitonin 0.35
The patient was discharged after a 36-hour hospitalization.

Figure 1: CT of chest showing the main pulmonary artery at bifurcation filled with contrast, indicating a filling defect (no thrombosis).

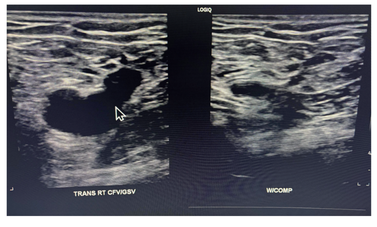

Figure 2: Note the right common femoral vein as seen normally on the left and the compressed vein on the right, which shows no evidence of thrombus.

DIAGNOSIS

1. Community-acquired pneumonia of the right lower lobe
2. Acute pulmonary edema
Treatment
Cefdinir 300 mg capsule
Azithromycin 500 mg tablet
Enoxaparin 40 mg
Tramadol 50 mg
Acetaminophen 325 mg
Ondansetron 4mg
CefTRIAXone 2 g in 20 ml NS
No DVT in the right or left lower extremity
No PE

DISCUSSION

A D-dimer test is a blood test that can be used to help rule out the presence of a serious blood clot.
When one gets a cut or wound, the body starts hemostasis to form a clot and stop from losing too much blood. It forms threads of a protein called fibrin to keep the clot in place. Once healed is complete, the clot breaks down into fragments. One of those fragments is called D-dimer, a part of a protein. But one gets high levels of D-dimer in the blood if one has a major clot such as with DVT, or PE.

A typical range of d-dimer level is 0-0.50 milligrams per liter (mg/L). Presence in the blood or urine may indicate that a person has developed a clot. D-dimer levels of 0.50 mg/L or higher may indicate blood clots somewhere in the body.

In our case, an 84-year-old male presented with a mild rise in temperature, leukocytosis, and an elevated d-dimer level; other systems were normal. Radiography showed no evidence of any VTE.

CONCLUSION

D-dimer is ordinarily undetectable or detectable at a very low level. It is well established that a blood clot with a high level of D-dimer is suspected, necessitating further evaluation. In our case, despite the significant elevation of d-dimer, any blood clots were ruled out. This case highlights that d-dimer is a valuable test for diagnosing VTE, but may yield negative findings.