Turk Thorac J 2020; 21(4): 287-8 DOI: 10.5152/TurkThoracJ.2020.20067

Letter to the Editor

Pulmonary Embolism in Covid-19: Coagulation Parameters, Close Monitoring to Prevent?

Anna Annunziata, Pasquale Imitazione, Giorgio Emanuele Polistina, Maurizia Lanza, Antonietta Coppola, Giuseppe Fiorentino

Department of Respiratory Pathophysiology, Monaldi-Cotugno Hospital, Naples, Italy

Cite this article as: Annunziata A, Imitazione P, Polistina GE, et al. Pulmonary embolism in Covid-19: Coagulation parameters, close monitoring to prevent?. Turk Thorac J 2020; 21(4): 287-8.

Received: *17.04.2020* ***Accepted:*** *16.05.2020* ***Available Online Date:*** *10.06.2020*

Dear Editor,

After beginning in China, SARS-CoV-2 infection rapidly spread in many countries and is now a global pandemic, with the number of cases dramatically increasing globally. We would like to share our experience in 70 patients with COVID-19 pneumonia and acute respiratory failure (ARDS) who were hospitalized in our intensive care unit in Naples, Italy. In our unit, the tracheal intubation rate was 8.5% (n=6) and overall mortality was 12.8% (n=9, mean age 70 years). All patients who died were on ventilation and had multiple comorbidities. Alterations in coagulation parameters were observed in 41% of cases (n=29).

Recently, Tang, et al. [1] retrospectively analyzed coagulation parameters and outcomes of 183 consecutive patients with confirmed COVID-19 pneumonia at Tongji hospital. In this population, the mortality rate was 11.5%. Significantly higher levels of D-dimer and fibrin degradation product were seen in non-survivors group compared to survivors. Moreover, 71.4% (15 of 21) of non-survivors met criteria for disseminated intravascular coagulation (DIC), based on diagnostic criteria of the International Society on Thrombosis and Haemostasis [2]. In that cohort, median time from admission to hospital to diagnosis of DIC was 4 days (range 1-12 days). They authors suggested that conventional coagulation parameters during infection of novel coronavirus were significantly associated with prognosis.

In our unit, 29 of 70 patients had significantly higher levels of D-dimer and fibrin degradation product (D-dimer >1000 ng/mL; n.v. <250 ng/mL; and FDP >15 mg/mL; n.v. 0-10 mg/mL).

Critical patients admitted to our intensive care unit who did not present contraindications underwent prophylaxis for venous thrombosis with enoxaparin 4000 IU/day or fondaparinux 2.5 mg/day, according to current recommendations [3]. In addition, following admission to hospital, all patients received prophylaxis with low molecular weight heparin, even if 72.4% (n=21 pt) met criteria for DIC after a mean of 5 days from hospitalization. In patients who met criteria for DIC, computed tomography pulmonary angiography detected evidence of thromboembolic defects of various extension in 81% of patients (17 of 21). All of these patients received therapeutic adjustment as required for conventional treatment of acute pulmonary embolism (APE), and all were on ventilation. Patients diagnosed with APE improved after anticoagulant therapy, but despite clinical improvement two patients died of cardiac arrest.

In our cases, if normal parameters were seen at the time of hospitalization, changes in blood coagulation parameters occurred at 1 to 10 days from admission. Three patients showed alteration of coagulation parameters at admission, with subsequent confirmed APE, and came to emergency department after 10 days of home care.

Other authors have described a few cases of APE, confirmed by CT pulmonary angiography, at 6 days after admission to hospital, although coagulation parameters were not reported [4]. In our experience, evidence of APE can often arise as a misunderstood but severe complication. Acute pulmonary embolism is undoubtedly a cause of respiratory deterioration in all patients, but in those with COVID-19 it can be fatal if not recognized early.

Therefore, in these patients, we show that low molecular weight heparin prophylaxis does not prevent the onset of venous embolism. Accordingly, careful monitoring of coagulation parameters is necessary for early detection of APE and may

Address for Correspondence: Anna Annunziata, Department of Respiratory Pathophysiology, Monaldi-Cotugno Hospital, Naples, Italy
E-mail: anna.annunziata@gmail.com

be useful to guide treatment. Future studies should aim to define the risk of APE in patients with COVID-19 pneumonia to prevent complications, optimize treatment, and attempt to change the prognosis.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - A.A.; Design - A.A., P.I., G.E.P.; Supervision - G.F.; Resources - A.A., M.L.; Materials - A.A., A.C.; Data Collection and/or Processing - P.I., G.E.P., M.L., A.C.; Analysis and/or Interpretation - A.A., P.I., G.E.P.; Literature Search - A.C., M.L.; Writing Manuscript - A.A.; Critical Review - G.E.P., G.F.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

1. Tang N, Li D, Wang X, et al. Abnormal coagulation parameters are associated with poor prognosis in patients with novel coronavirus pneumonia. J Thromb Haemost 2020;18:844-7. [Crossref]
2. Toh CH, Hoots WK, on behalf of the SSC on Disseminated Intravascular Coagulation of the ISTH. The scoring system of the Scientific and Standardisation Committee on Disseminated Intravascular Coagulation of the International Society on Thrombosis and Haemostasis: A 5 year overview. J Thromb Haemost 2007;5:604-6. [Crossref]
3. Schünemann HJ, Cushman M, Burnett AE, et al. American Society of Hematology 2018 guidelines for management of venous thromboembolism: Prophylaxis for hospitalized and non hospitalized medical patients. Blood Adv 2018;2:3198-225. [Crossref]
4. Xie Y, Wang X, Yang P, et al. COVID-19 complicated by acute pulmonary embolism. J Thorac Imaging 2020;2:e200067. [Crossref]