



SOFT TISSUE HEMATOMA IN COVID-19 PATIENTS ON ANTICOAGULANT THERAPY

Dr Reena Vaghasiya	Radiology Resident, SVP Hospital, Smt. NHL Medical College, Ahmedabad.
Dr Chhaya bhatt	Professor, SVP Hospital, Smt. NHL Medical College, Ahmedabad.
Dr Samarth Damania	Radiology Resident, SVP Hospital, Smt. NHL Medical College, Ahmedabad.
Dr Sarthak gohel	Radiology Resident, SVP Hospital, Smt. NHL Medical College, Ahmedabad.

ABSTRACT

Introduction: Anticoagulation plays a key role in reducing the risk of systemic thrombosis in patients with severe COVID-19. The use of anticoagulants may increase the risk of hemorrhagic manifestations among COVID-19 patients because of lack of data on optimal dosage of anticoagulant effects. Rapid diagnosis and timely intervention are necessary to prevent lethal outcomes.

Materials and Methods: Retrospective observational study was carried out from March 2019 to May 2021 in the department of radio-diagnosis at S.V.P hospital, Ahmedabad on 30 patients with spontaneous soft tissue hematoma.

Results: Our retrospective study suggested that out of 30 patients (26 patients were on prophylactic or therapeutic anticoagulant therapy and 4 were not on anticoagulant therapy), majority of patients developed rectus sheath hematoma (19 patients) followed by hematoma in ilio-psoas muscle (4 patients), thigh (2 patients), arm (2 patients), neck (2 patients) and left pectoral muscle (1 patient).

Conclusion: When anticoagulants are considered in the management of COVID-19, it is necessary to closely monitor potential bleeding complications particularly in old aged patients with comorbidities or patients at higher hemorrhagic risk as it can turn lethal sometimes.

KEYWORDS :

INTRODUCTION :

- In December 2019, a novel coronavirus (SARS-CoV-2), was identified as the cause of a cluster of pneumonia cases in Wuhan. In the first few months, infection with this novel coronavirus led to a global pandemic that has now affected almost every country in the world. Although SARS-CoV-2 disease primarily manifests as a lung infection, with symptoms ranging from those of a mild upper respiratory infection to severe pneumonia and acute respiratory distress syndrome (ARDS), other multisystem manifestations of this disease and related complications are also recognized [1,2].
- Alterations of coagulation profile, such as fibrinogen, prothrombin time (PT), factor VIII and D-dimer, have been described.^[3] Use of anticoagulant prophylaxis is recommended in these patients.^[4,5] Prescribing anticoagulant treatment according to high D-dimer levels and sepsis-induced coagulopathy (SIC) score equal to or higher than 4 is associated with a favorable outcome.^[6] Also, heparin exerts anti-inflammatory effects, which can help reduce tissue damages caused by cytokine storm.^[7] However, no data are available to indicate dosage and duration of anticoagulation treatment, specifically in COVID-19 patient.

MATERIALS AND METHODS:

- Retrospective observational study was carried out from March 2019 to May 2021 in the department of radio-diagnosis at S.V.P hospital, Ahmedabad on 30 patients with spontaneous soft tissue hematoma in COVID-19 patients.
- USG was done as first line imaging modality in all the clinically suspected patients with deranged blood profile and local site swelling.
- Patients who clinically deteriorated further were evaluated with contrast enhanced CT imaging. MDCT were performed through I.V injection of 60 ml of non-ionic contrast. Volumetric data was obtained. Contiguous axial, coronal and sagittal reformatting images of arterial and venous phase were obtained.

INCLUSION CRITERIA:

COVID -19 positive patients (RT-PCR positive or CT findings suggestive of COVID-19 pneumonia) with spontaneous soft tissue hematoma due to deranged coagulation profile.

EXCLUSION CRITERIA:

Soft tissue hematoma in COVID-19 patients due to other causes like during central line insertion or I.V puncture.

RESULTS:

Between March 2020 to March 2021, we reported 30 patients (17 females and 13 males) with hemoglobin drop (mean Hb drop: 2.9 g/dL) and evidence of spontaneous soft tissue hematoma. A multiphasic contrast-enhanced CT and USG showed that majority of patients (**Table no. 1**) developed rectus sheath hematoma (19 patients) followed by hematoma in ilio-psoas muscle (4 patients), thigh (2 patients), arm (2 patients), neck (2 patients) and left pectoral muscle (1 patient) All the patients had high d-dimer levels ranging from 600 - 9500 mg/dL (normal 0-500 mg/dL). Out of 30 patients 26 were on therapeutic (6 patient with DVT and 2 patient with pulmonary thromboembolism) or prophylactic (18 patient) anticoagulant therapy. 4 were not on anticoagulant therapy because of thrombocytopenia (< 85,000/microliter) of which 1 patient had associated dengue hemorrhagic fever.

Out of 30 patients, CECT was done in 12 patients due to clinical deterioration, continuous Hb drop (>3-5 g/dL) and expansion of hematoma (on follow up USG) which showed increase in size and extent of hematoma.

5 patients with rectus sheath hematoma reported active leak from inferior epigastric artery on CECT out of which 4 patients died because of uncontrolled bleeding.

Out of 30 patients 26 patient (86.6%) were above 60 years (**Chart.1**) and with pre-existing comorbidities. 20 patients (66.6%) were hypertensive (6 patients had past history of IHD) and were already taking antiplatelet therapy. 3 patients (10%)

were below the age of 45 year with nil comorbidity (table no.2).

Table 1: Site wise distribution of hematoma

Site of soft tissue haematoma	No. of patients
Rectus sheath hematoma	19 (63.3%)
Ilio-psoas muscle	05 (16.66%)
Thigh	01 (3.33%)
Arm	01 (3.33%)
Neck	02 (6.66%)
Left pectoral muscle	01 (3.33%)
Total	30

Table 2: Patients with and without comorbidities

	No. of patients
Hypertension and IHD	20
Other comorbidities	07
Nil comorbidities	03

Chart 1 :

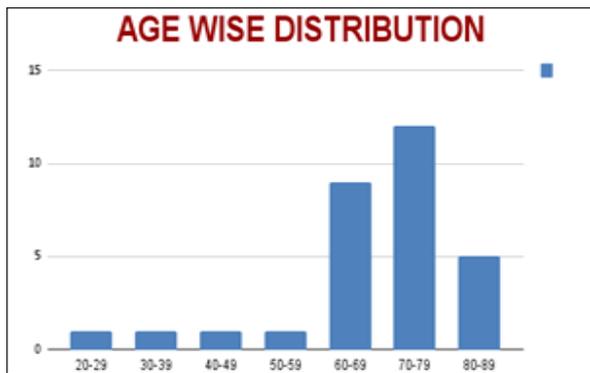


Figure 1:



72 year old hypertensive female had d-dimer level 760 mg/dl and Hb drop of 3.2 g/dl with pulmonary thromboembolism was on anticoagulant therapy. Axial noncontrast CT scan of pelvis shows Large hematoma in right rectus abdominis muscle extending into pelvis and right paravesical space causing compression over urinary bladder.

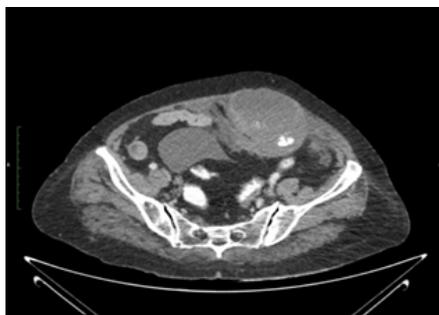


Figure 2:

74 year hypertensive male had d-dimer 9500 mg/dl and Hb

drop 2.5 mg/dl with DVT was on anticoagulant therapy. Axial contrast enhanced CT of abdomen shows Hematoma in left rectus muscle and adjacent anterior abdominal wall muscles extending into pelvis with few small areas of contrast pooling in portal venous phase, suggestive of active slow leak

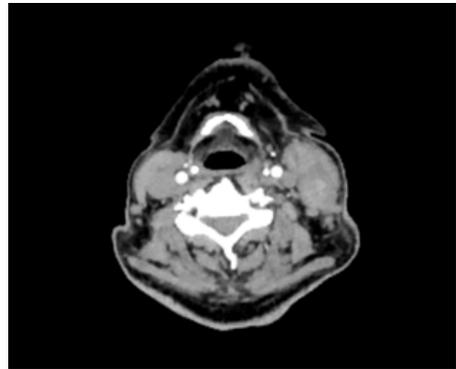


Figure 3 :

72 year old hypertensive male with past history of cerebrovascular stroke. Patient's d-dimer was 3600 mg/dl and was on prophylactic anticoagulant therapy. Axial Contrast enhanced CT of NECK shows Left sternocleidomastoid muscle hematoma

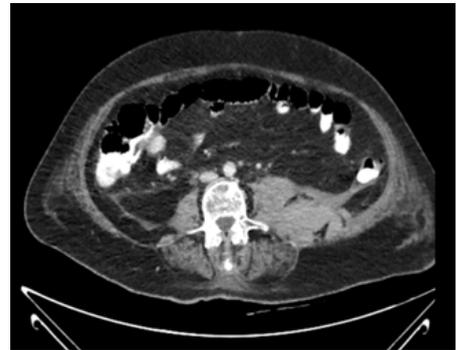


Figure 4:

72 year old female with hypertension and vascular dementia. Patient's d-dimer was 2900 mg/dl with HB drop of 2.4mg/dl was on prophylactic anticoagulant therapy. Axial CECT of abdomen shows left psoas major muscle hematoma

DISCUSSION :

There are many cases in the recent literature of different patterns of vascular disease in patients with SARS-CoV-2 infection, most of which point towards the hypercoagulability related to COVID-19 with potentially fatal consequences including deep vein thrombosis, stroke, and heart attack.

These findings led to the practice of giving high doses of anticoagulant drugs — to prevent the development of blood clots — to patients hospitalized with COVID-19 throughout their treatment.

For hospitalized patients with COVID-19, prophylactic dose anticoagulation is prescribed unless contraindicated (e.g., a patient has active haemorrhage or severe thrombocytopenia). A retrospective study showed reduced mortality in patients who received prophylactic anticoagulation, particularly if the patient had a sepsis-induced coagulopathy score ≥ 4 .^[6] Anticoagulation is routinely used to prevent arterial thromboembolism in patients with heart arrhythmias.

Patients who are receiving anticoagulant or antiplatelet therapies for underlying conditions should continue these medications even if they diagnosed with COVID-19.

Spontaneous soft tissue hematoma is a well-known and potentially life-threatening complication of anticoagulation therapy. There are currently insufficient data to recommend either for or against the use of thrombolytics or higher than the prophylactic dose of anticoagulation for VTE prophylaxis in hospitalized COVID-19 patients outside of a clinical trial.

In our retrospective study of hospitalized 30 patient 26 patient was on prophylactic or therapeutic anticoagulation therapy. most of the patient were >60 year (86.6%) with comorbidities like hypertension (66.6%) were already on antiplatelet therapy and deranged coagulation profile and was Receiving LMWH and developed soft tissue hematoma after few days of starting LMWH.

Although thrombotic events represent the most common coagulation disorders, some factors such as thrombocytopenia, hyperfibrinolytic state, consumption of coagulation factors and administration of anticoagulant make COVID-19 patients prone to bleeding. In our study 4 patient were not on anticoagulation therapy because of high bleeding risk (thrombocytopenia) of which one patient had simultaneous dengue hemorrhagic fever.

Rectus sheath hematoma (63.3%) was the most common site of soft tissue hematoma in our study. LMWH is administered via subcutaneous route usually around umbilicus. Wrong administration of LMWH injection into intramuscular plane may contribute to the rectus sheath hematoma in these patients.

For diagnosis, careful physical examination is important and can detect ecchymotic areas of the abdominal skin and palpable painful masses.

To confirm the diagnosis, USG was done as primary screening modality. CT was done unless contraindicated in patients with clinical deterioration, continuous Hb drop (>3-5 g/dL) and expansion of hematoma. A CT scan with contrast provides information about contrast extravasation and all the intra-abdominal structures. However, in cases in which contrast is contraindicated, noncontrast CT is also helpful for extent of hematoma.

Most of the patients were managed conservatively with stoppage of anticoagulation therapy and were recovered. However, sometimes it can be lethal. In our study, 5 patient with rectus sheath hematoma had active leak from inferior epigastric artery of which 4 patient had uncontrolled bleeding with pelvic extension of the hematoma despite aggressive intervention and died because of major bleeding.

CONCLUSION

In conclusion, Most of the data confirm the broad range of COVID-19 complications, other than the respiratory ones. Among them, vascular involvement not only to hypercoagulability features, but also to bleeding ones. When anticoagulants are considered in the management of COVID-19, it is necessary to closely monitor potential bleeding complications particularly in old aged patients with comorbidities or patients at higher hemorrhagic risk as it can turn lethal sometimes.

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