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Hemorrhage Is a Major Cause of Blood Transfusion in COVID-19 Patients

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INTRODUCTION

Reports from China and other countries have allowed to quickly understand the clinical and biological features of COVID-19. In contrast, little has been published on the transfusion requirements of COVID-19 patients and the clinical characteristics of transfused patients.

PATIENTS AND METHODS

For this cross-sectional study, we reviewed the blood bank and clinic records of 80 consecutive patients diagnosed with COVID 19, who required red blood cells (RBC) transfusion at the Hospital Clínic of Barcelona over a period of 60 days, from mid-March to mid-May 2020. COVID-19 was confirmed by at least two PCR test in nasopharyngeal swabs. Categorical data were described as frequencies and percentage and continuous variables were summarized as median and interquartile range (IQR)

RESULTS

Median age was 71 years (IQR: 62-76) and 59 (74 %) patients were males. The patients' main clinical characteristics and the indications for transfusion are summarized in the table. In total, the 80 patients received 2,081 RBC units in 261 independent transfusion episodes. Number of days on transfusion support ranged from 1 to 44 (median: 5).

Bleeding was the indication for transfusion in 55 patients (69%), and included either large hematomas in 22 and external hemorrhage in 31. Anemia of critical illness was the reason for transfusion in 22 (27%) patients. Most patients were on anticoagulants at the time of transfusion or the two days before (table). In total, 138 of the 261 transfusion episodes (59%) were related to spontaneous (94) or procedure-related (44) bleeding. Spontaneous bleeding was more frequent in the retroperitoneal space and the gastrointestinal apparatus. Tracheostomy with endotracheal intubation, surgical interventions, and cannulation of femoral vessels were the main procedures behind non-spontaneous bleeding.

Hemorrhage was protracted and difficult to control and patients often required transfusion support for several days. Not rarely, hemorrhage recurred when the patient was restarted on anticoagulants. It was not unusual for bleeding from an anatomical location to be followed by, and overlapped with bleeding from a different location.

Seventeen patients died during the period on study. None of the deaths was ascribed to hemorrhage or the blood transfusion.

DISCUSSION

Bleeding, mostly related to the use of anticoagulants, was the main indication for RBC transfusion in patients with COVID-19.

Figure 1

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Table. Characteristics of 80 patients with COVID-19 who required red blood cell transfusion.^a

Laboratory data at first transfusion ^b	%
Hgb, mg/dl ^c	7.6 (7.2-8.3)†
Ferritin, µg/ml ^c	938 (367-1,534)†
D-dimer, cg/ml ^c	2,800 (1,200-4,800)†
Indication for transfusion ^d	%
Large hematoma†	22 (27%)†
Retroperitoneal†	11†
Femoral†	4†
Cerebral†	1†
Thoracic and abdominal wall†	2†
Other location†	4†
Hemothorax†	31 (39%)†
Gastrointestinal†	11†
Related to tracheostomy/endotracheal intubation†	8†
Pulmonary†	3†
Surgery-related†	4†
Other anatomical location†	5†
Anemia of critical illness†	22 (27%)†
Anemia of neoplasia†	5†
ECMO ^e	2†
Other causes of anemia†	10†
On anticoagulation ^f	%
None†	7 (9%)†
Low- or intermediate dose ^g	31 (39%)†
Full anticoagulant dose ^g	42 (52%)†
Outcome at the study's closure†	%
Deaths	17 (21%)†
Discharged (home or other hospital)†	29 (36%)†
Still in hospital†	34 (43%)†

^a Median (interquartile range). ^b COVID-19 diagnosed once the patients was already in hospital for unrelated reason. ^c Several patients required transfusion for more than one indication while in hospital. ^d ECMO: extracorporeal membrane oxygenator. ^e Several patients were changed from one to another anticoagulant dosage while in hospital. ^f Enoxaparin (14 out of the 261 transfusion episodes), dabigatran (12), and fondaparinux (2). ^g Enoxaparin (64 of the 261 transfusion episodes), unfractionated heparin (51), rivaroxaban (4), and oral apixaban (1).

Disclosures

No relevant conflicts of interest to declare.

Author notes

* Asterisk with author names denotes non-ASH members.