To the Editor,

On December 2019, a Coronavirus disease 19 (COVID-19) emerged in Wuhan, China, and caused a global pandemic, the disease has a systemic manifestation including hematopoietic system. It is clear that the hematologic laboratory will play an essential role in this crisis, contributing to patient screening, diagnosis and prognosis. To date, Complete blood count (CBC) has been recommended as a useful tool for the patient monitoring. Quantitative hematologic abnormalities have been reported since the first papers, all blood cells can be affected during COVID-19, mainly leukocyte and platelet [1]. Blood smears are not performed systematically, but due to the presence of quantitative anomalies, a qualitative evaluation is therefore useful to analyze morphology change during COVID-19.

In Morocco, the situation is less critical than in Europe and USA, with a record of 6741 confirmed cases and 192 deaths [2]. A COVID-unit has been created in our Hospital to provide assistance and care to patients from Casablanca region. We have had up to 146 patients infected by COVID-19 on May 16, 2020. The CBC parameters of our patient (N:146) showed neutropenia (7.5%), hyperleukocytosis (8%), eosinopenia (47%), monocytosis (9.5%) lymphopenia (46%) and thrombopenia (10%). We control 15 first peripheral blood smears at
admission and we found morphological abnormalities concerning leukocyte and platelet lineage. By observing blood smears colored by May Grunwald Giemsa (MGG), we noted the characteristics of neutrophil granulocyte with dysmorphic morphology marked by hypogranular cytoplasm and hypo segmented nucleus. We observed the presence of atypical eosinophils containing multiple vacuoles. Rare activated lymphocytes and large monocytes were found in some peripheral blood films. Platelet morphology, also showed frequent anomalies, mainly consisting of giant platelets with different size (Figure 1).

Only rare articles are published related to blood morphology during COVID-19 infection. Two recent publications described blood smears of patients infected, the morphology of neutrophil and platelet lineage showed very frequent anomalies, concerning nuclear morphology, cytoplasmic granulation and the presence of atypical and immature cells [3,4].

Like most viruses that impact the hematopoiesis and immune system during developmental stages [5], COVID-19 causes blood cells change by inflammatory mechanism and perturbation of myelopoiesis system [6], moreover, it appears to have more serious effects, with deep cytopenia predictive of the severity [7]. The CBC completed by peripheral blood smears can detect the impact of virus on blood, which can reflect early inflammatory signs. Our preliminary results remain limited and requires more investigation to study reversibility of these abnormalities and here impact to severity. Compared to all inflammatory biomarkers, observation of blood cells can be a simple alternative to first triage and early identification of infection.

Keywords: COVID-19, morphology cells, Blood smears

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Informed Consent: Informed consent was obtained from the patient included in the study.

Authorship Contributions
Concept and Design: M.A.;  Data Collection or Processing: S.N., M.S., N.D.; Literature Search and interpretation: M.A., F.O.; Writing: M.A.

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References


**Figure 1.** Blood smears of patients with COVID-19 (May Grunwald Giemsa MGG). a: Eosinophil containing multiple vacuoles, b: Giant platelet with different size, c: Circulating of large lymphocyte, d: Neutrophil granulocyte with marked hypogranular cytoplasm and hyposegmented nucleus.