

Presence of Atypical Monocytes in Peripheral Blood of Covid-19 Patients

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Introduction

In the period from February to April 2021, blood samples were collected, from one hundred COVID-19 patients in Sarajevo, Bosnia and Herzegovina, and stained with May-Grunwald-Giemsa according to the Pappenheim method. Peripheral blood smears were examined by experienced specialists in clinical biochemistry and medical laboratory engineers. Examination of the peripheral blood smear revealed atypical monocytes, whose atypia relies on a change in the shape of the nucleus and the appearance of many vacuoles in the cell. Microscopic examination of 30 patients revealed monocytes whose nucleus, instead of the usual bean-shaped or kidney-shaped shape, took on a shape resembling a clover or a butterfly (Panel A). Vacuolization of the monocyte cell is a change that occurred in a larger number (n=80) of COVID-19

patients. The nucleus and cytoplasm of these atypical monocytes are irregular in shape and have a different N/C ratio and vacuoles are present in both the nucleus and the cytoplasm (Panel B and C). Atypical monocytes with similar characteristics were also found in other studies [1] and they were named as aberrant monocytes [2]. Monocytes play an important role in the body's defense during infection with the SARS-CoV-2. Circulating monocytes are the first to respond in a proportional size that corresponds to the intensity of exposure to the microorganism. Monocytes in the blood are a transitional stage between the site of production and action during infection. Monocytes play a role in the cytokine storm that leads to acute lung injury and acute respiratory distress syndrome (ARDS) in COVID-19 patients [3] (figure 1,2).

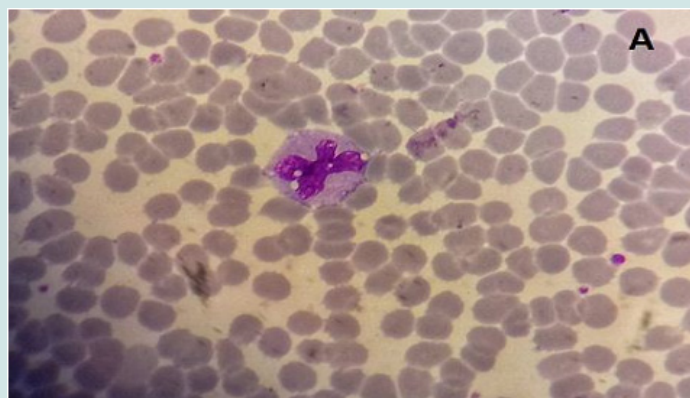


Figure 1: Monocyte with the clover- or butterfly-shaped nucleus (Panel A) (imersion, magnification x1000).

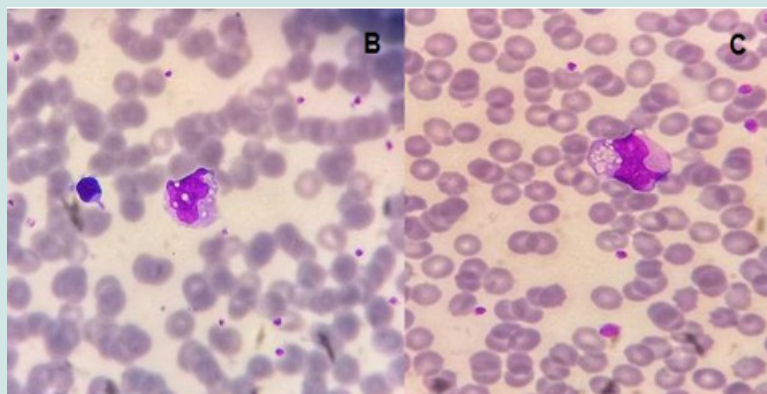


Figure 2: Monocyte with vacuolised nucleus (Panel B) and cytoplasm (Panel C) (imersion, magnification x1000).

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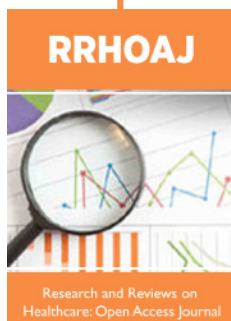
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