



A Retrospective Study of Monocyte Distribution Width (MDW) in the Outcomes of Patients with COVID-19

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Background

- Sepsis is a major cause of mortality, and early recognition has been shown to improve outcomes.
- Monocytes play a crucial role in the innate immune response to infection.
- MDW describes size of circulating monocytes, and is calculated from a complete blood count.

Methods

STUDY GROUP

In the ED, patients presented with positive PCR testing for COVID-19.

N=331

(+) COVID-19 patients with recorded MDW.

DATA EXTRACTION

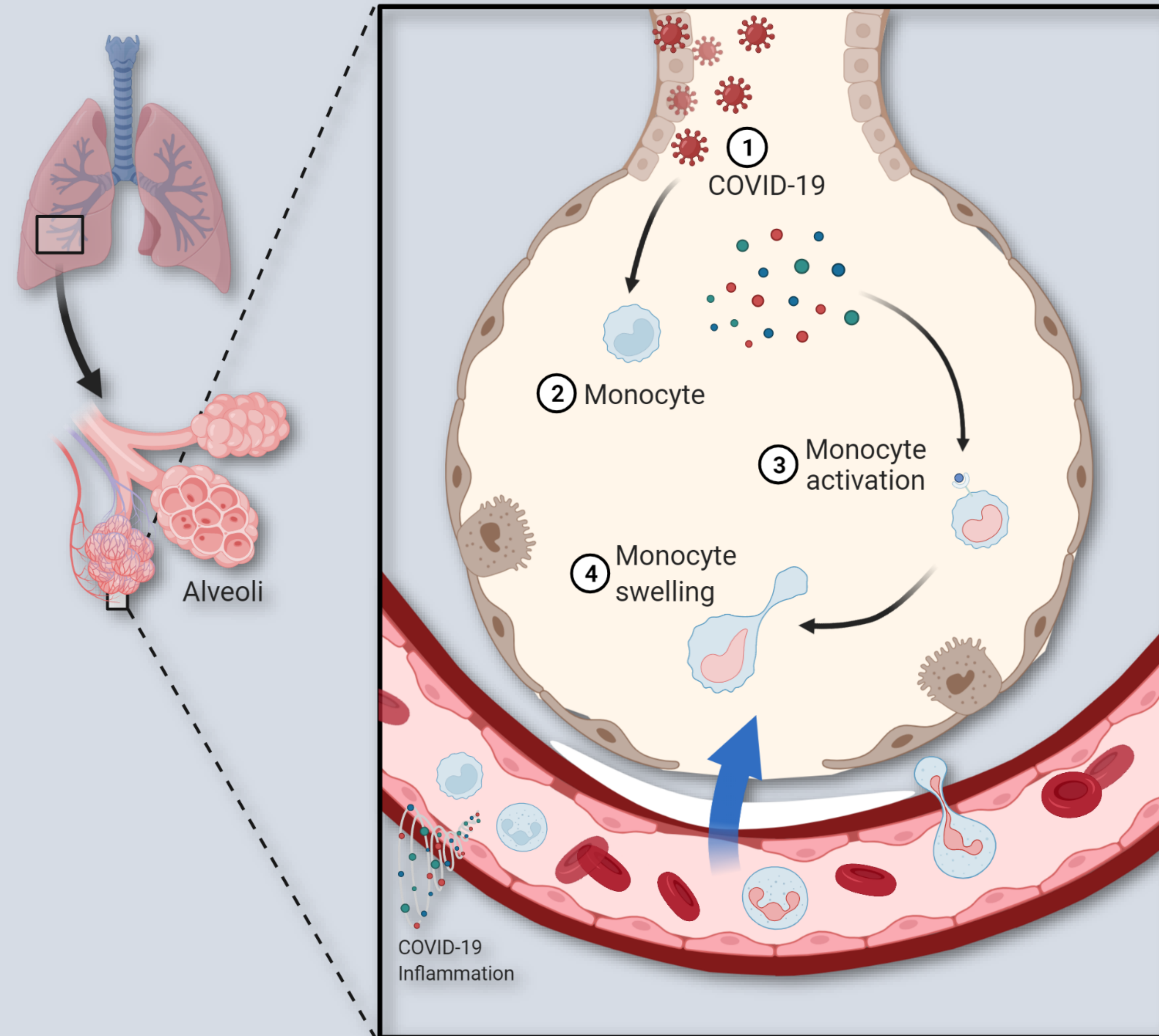
Utilized the EHR system using ICD-CM-10 coding for acute respiratory failure and sepsis.

Other variables included: gender, age, ethnicity, MDW, ICU admission, outcome, and inflammatory markers.

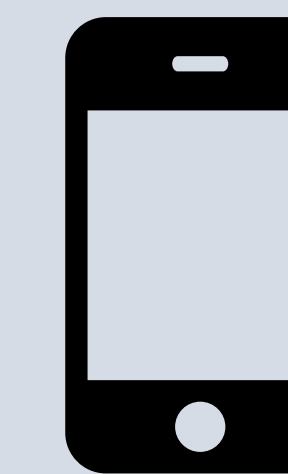
STATISTIC ANALYSIS

Data evaluated in terms of the area under the curve (AUC), ROC analysis, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV).

In COVID-19 patients, monocyte distribution width (MDW) is a novel and easily exploitable cytomarker in detecting sepsis and clinical outcomes of respiratory failure and death.



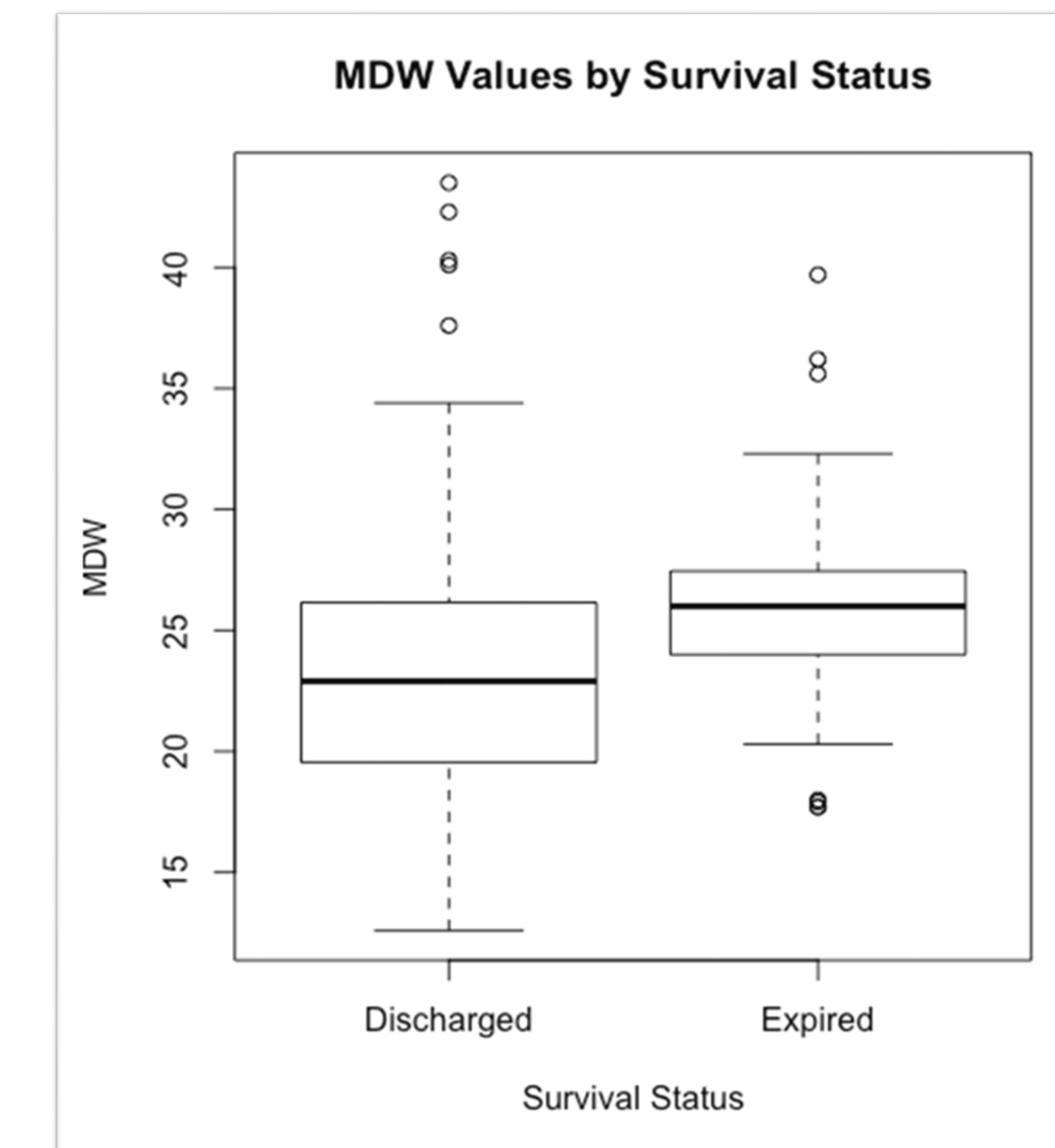
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Results

Variable	Sepsis	No Sepsis	t (95% C.I.)	P-Value
MDW	25.50 ± 5.930	23.13 ± 4.460	-3.13 (-3.87, -0.86)	< 0.01
Ferritin	858.5 ± 1164	638.8 ± 826.4	-1.17 (-593, 154)	0.25
D-dimer	7560 ± 17690	1933 ± 3725	-2.38 (-10353, -900)	0.02
Pro-cal	2.910 ± 6.100	0.950 ± 4.470	-2.28 (-3.68, -0.25)	0.02
Lactic acid	2.330 ± 1.880	1.640 ± 0.840	-2.91 (-1.16, -0.22)	< 0.01

- For detecting sepsis, MDW did not correlate with other inflammatory markers.
- MDW had the highest negative predictive value for death at 95%, and was 85% for sepsis.

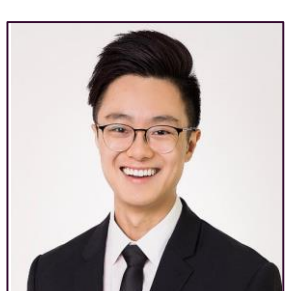
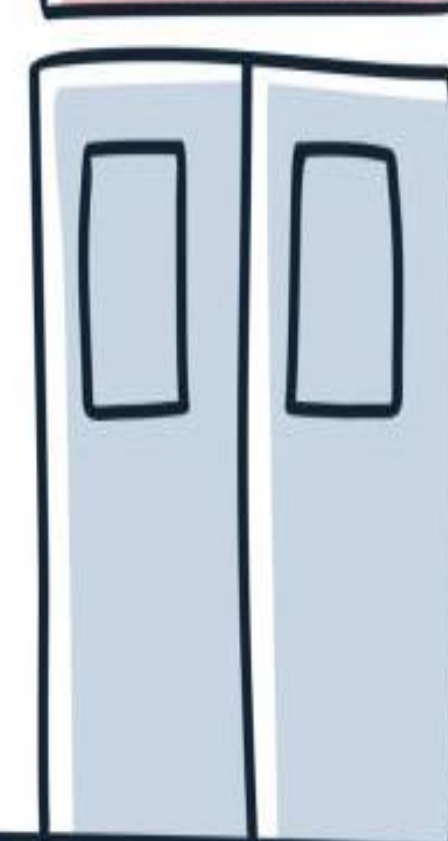


- An MDW value greater than 24.9 had an absolute risk increase of 25% in fatal outcomes.
- A significantly elevated MDW demonstrated a sensitivity of 82% and 91% for sepsis and death, respectively.
- Average MDW was found to be significantly higher in patients with sepsis (25.50 ± 5.930; p < 0.001).
- Patients who experienced hypoxia/respiratory failure had a significantly higher MDW of 24.9 compared to those who did not.

Discussion

- In the emergency room, MDW is easily obtained from routine lab evaluations and has the potential to be a useful tool in the triage of COVID-19 patients.
- Future studies will be aimed at how MDW pertains to other diseases processes, such as leukemia, lymphoma, etc.

EMERGENCY



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