

Pranav Ish¹, Nipun Malhotra¹, Sumita Agrawal², Nitesh Gupta¹

¹Department of Pulmonary, Critical Care and Sleep Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India

²Department of Pulmonary, Critical Care and Sleep Medicine, Medipulse Hospital, Jodhpur, Rajasthan, India

Relative lymphocytosis in COVID-19 — a ray of hope

Dear Editor

A recent article on 150 COVID-19 patients from Wuhan, China, was a comprehensive analysis of clinical predictors of mortality [1]. Age, cardiovascular comorbidities, total leucocyte counts, lymphocyte count, platelet count, liver and kidney functions, IL-6, C-reactive peptide (CRP) and cardiac biomarkers were significantly associated with increased mortality. Fulminant myocarditis was stressed as a poor prognostic marker. However, an equally important parameter is the percentage of lymphocytes. In the same trial, total leucocyte count was 10.62×10^9 cells/litre vs 6.76×10^9 cells/litre in the dead vs survival group, respectively. On the other hand, lymphocytopenia was more profound; 0.662×10^9 cells/litre in the dead group vs 1.4262×10^9 cells/litre in the survival group. Both these values were statistically significant (p value < 0.05) [1].

Similarly, in an initial compilation of data of 51 COVID-19 patients at the authors' current centre from India, a trend supporting all the above observations is becoming increasingly noticeable. The mean leucocyte count was 5.7×10^9 cells/litre with a mean lymphocyte percent of 40.6% (Figure 1, 2). As the mean leucocyte count falls in the normal range, this is a relative lymphocytosis, defined as increased lymphocyte percent to 40% or more [2]. The mean haemoglobin was 16 g/dL and platelet count was 260×10^9 per litre. All the patients had stable vitals, preserved organ functions and required only symptomatic treatment for fever with or without cough; thereby being classified as having mild upper respiratory tract infection [3].

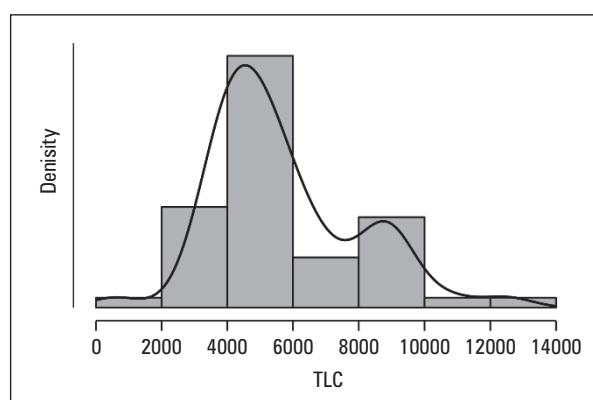


Figure 1. The distribution of total leucocyte count with a mean of 5.7×10^9 cells/litre

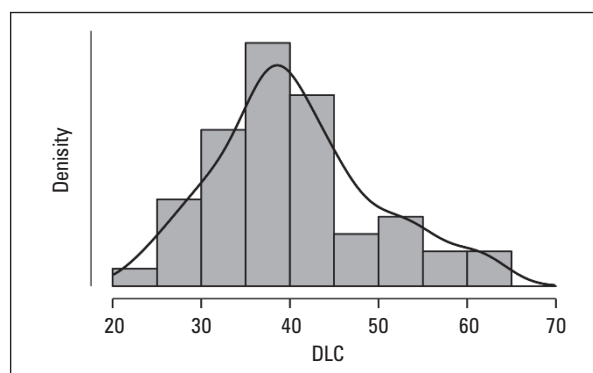


Figure 2. The lymphocyte percent is normally distributed with mean of 40.6% and a standard deviation of 9.0%

Lymphopenia has been found to be very common (85%) in critically ill COVID-19 patients [4]. Another study tried to develop predictive models,

where lymphocyte count > 20% at day 10 of illness has been found to be characteristic of the moderate group with favourable prognosis [5]. In concordance with that, as our mean lymphocyte count was 40.6%, all patients were predicted to have a recovery.

Multiple mechanisms have been proposed for lymphopenia in severe COVID-19. Direct lymphocyte inhibition, lymph node destruction, inflammatory cytokines, lactic acidosis suppressing lymphocytes and coronavirus attaching to the angiotensin-converting enzyme 2 (ACE2) receptor on lymphocyte are few plausible explanations [4]. However, relative lymphocytosis defies all these pathophysiologies and hence may be an indication of a favourable prognosis. Acute viral illnesses like varicella, influenza, infectious mononucleosis are also associated with relative lymphocytosis; most of these eventually develop a spontaneous recovery [6]. The mechanism as to why some people respond favourably needs further research.

This is a very significant observation as a leucocyte count with differential count is done in all patients at admission. This, along with other

predictors like age and comorbidities, can be used to make a quick, early decision on the further priority and triage, thereby assisting in efficient resource allocation.

Conflict of interest

None declared.

References

1. Ruan Q, Yang K, Wang W, et al. Clinical predictors of mortality due to COVID-19 based on an analysis of data of 150 patients from Wuhan, China. *Intensive Care Med.* 2020; 46(5): 846–848, doi: [10.1007/s00134-020-05991-x](https://doi.org/10.1007/s00134-020-05991-x).
2. Hamad H, Mangla A. Lymphocytosis. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2020.
3. Revised Guidelines on Clinical Management of COVID-19. Downloaded from: <https://www.mohfw.gov.in/pdf/RevisedNationalClinicalManagementGuidelineforCOVID1931032020.pdf>. [Last accessed on 9 April 2020].
4. Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med.* . 2020; 8(5): 475–481, doi: [10.1016/s2213-2600\(20\)30079-5](https://doi.org/10.1016/s2213-2600(20)30079-5).
5. Tan Li, Wang Qi, Zhang D, et al. Lymphopenia predicts disease severity of COVID-19: a descriptive and predictive study. *Signal Transduct Target Ther.* 2020; 5(1), doi: [10.1038/s41392-020-0148-4](https://doi.org/10.1038/s41392-020-0148-4).