



## HScore could be a Predictor of COVID-19 Outcomes

Attapon Cheepsattayakorn<sup>1,3\*</sup>, Ruangrong Cheepsattayakorn<sup>2</sup> and Porntep Siriwanarangsun<sup>3</sup>

<sup>1</sup>10<sup>th</sup> Zonal Tuberculosis and Chest Disease Center, Chiang Mai, Thailand

<sup>2</sup>Department of Pathology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

<sup>3</sup>Faculty of Medicine, Western University, Pathumtani Province, Thailand

**\*Corresponding Author:** Attapon Cheepsattayakorn, 10<sup>th</sup> Zonal Tuberculosis and Chest Disease Center, Chiang Mai, Thailand.

The first commonly clinical criteria used for the diagnosis of secondary hemophagocytic lymphohistiocytosis (sHLH) was established in the HLH-2000 study [1] and in 2014, a hemophagocytic syndrome clinical scoring system (HScore) has been developed for the diagnosis of sHLH [2,3]. For monitoring hyperinflammation (HI) in COVID-19, HScore has been proposed [4]. San., *et al.* demonstrated in their study on the determining the COVID-19 severity by HScore, MuLBSTA, Quick SOFA (qSOFA), Sequential Organ Failure Assessment (SOFA), and the Brescia-COVID Respiratory Severity Scale (BCRSS) that the area under the curve (AUC) of the HScore, MuLBSTA, SOFA, qSOFA, and BRCSS were 0.698, 0.860, 0.958, 0.961, and 0.977, respectively [5]. At the time of hospital admission, the calculation of the qSOFA and BRCSS can predict COVID-19 patients' critical clinical outcomes, and the predictive values of SOFA, MuLBSTA, and HScore are inferior to those of qSOFA and BRCSS [5]. A recent study conducted by Ardern-Jones., *et al.* in a small cohort that % HScore demonstrated no excess mortality compared to the whole cohort, whereas, % HScore were lower in older patients ( $p < 0.0001$ ) and did not predict reliably the outcomes at any cut-off value (AUROC: 0.533,  $p = 0.211$ , Odd Ratios: 0.99) [6]. Nevertheless, severe inflammation in COVID-19 may be reflected by high HScore (at least 130) rather than sHLH, and some investigators have recommended using this score in all COVID-19 patients [2,7,8]. HScore could be affected by the large randomized control trials' data that have modified the practice of hydroxychloroquine or lopinavir/ritonavir prescription in favor of steroid use [9,10].

In conclusion, when designing the clinical trials of anti-inflammatory treatments, an impaired anti-viral response and an excessive inflammatory response should be determined. High % HScores possibly reflect dysregulated immunity.

### Bibliography

1. Henter JL, *et al.* "HLH-2004: Diagnostic and therapeutic guidelines for hemophagocytic lymphohistiocytosis". *Pediatric Blood Cancer* 48 (2007): 124-131.
2. Fardet L., *et al.* "Development and validation of HScore, a score for the diagnosis of reactive hemophagocytic syndrome". *Arthritis Rheumatology* 66 (2014): 2613-2620.
3. La Rosée P, *et al.* "Recommendations for the management of hemophagocytic lymphohistiocytosis in adults". *Blood* 133 (2019): 2465-2477.
4. Mehta P, *et al.* "COVID-19: consider cytokine storm syndromes and immunosuppression". *Lancet* 395 (2020): 1033-1034.
5. San I, *et al.* "Brescia-COVID Respiratory Severity Scale (BCRSS) and Quick SOFA (qSOFA) score are most useful in showing severity in COVID-19 patients". *Scientific Reports* 11 (2021): 21807.
6. Ardern-Jones M., *et al.* "Secondary haemophagocytic lymphohistiocytosis in hospitalized COVID-19 patients as indicated by a modified HScore in infrequent and high scores do not associate with increased mortality". *Clinical Medicine* 21.5 (2021): e543-e547.

7. Takami A. "Possible role of low dose etoposide therapy for hemophagocytic lymphohistiocytosis by COVID-19". *International Journal of Hematology* 112 (2021): 122-124.
8. Bordbar M., *et al.* "Assessment of the HScore as a predictor of disease outcome in patients with COVID-19". *BMC Pulmonary Medicine* 21 (2021): 338.
9. RECOVERY Collaborative Group., *et al.* "Dexamethasone in hospitalized patients with COVID-19-preliminary report". *The New England Journal of Medicine* 384 (2020): 693-704.
10. RECOVERY Collaborative Group., *et al.* "Effect of hydroxychloroquine in hospitalized patients with COVID-19". *The New England Journal of Medicine* 383 (2020): 2030-2040.

**Volume 5 Issue 1 January 2022**

**© All rights are reserved by Attapon Cheepsattayakorn.,  
*et al.***