



**Search completed: 09/04/20**

**Requested by: senior biochemist**

**Literature search results**

**Please let me know if you’d like any of the listed articles in full-text**

**(If you’d like to be sent any subsequent articles that are published on this topic please contact me and I will set you up with an emailed alert).**

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| **Question** | * Evidence for using serum ferritin test to monitor patients with COVID-19 to assess prognosis or determine time of escalation of therapy? * Best lab tests for monitoring progress of hospitalised patients suffering from COVID-19? |
| **Summary of evidence found** | It was not possible to establish definitive answers to these questions. Research is still ongoing, but it looks as if there are several different possibilities that would indicate deterioration / severity. The update from the ACB Scientific Committee (2020) lists:   * Lymphocytopenia (most common), thrombocytopenia and leukopenia (both less common) * High concentrations of CRP * Elevations of AST, ALT, CK and D-dimer (less common) * Possible decreases in albumin * Possible increases in LDH, total bilirubin, creatinine, procalcitonin, cardiac troponin and natriruretic peptides * Cardiac biomarkers   There is also emerging evidence that suggests a role for ferritin – this has been included.  Cytokine storm syndrome has been observed in more severe cases. Information on this has been included in the **This may also help** section. |
| **Most useful information** | Gaze, D. C. and McCormick, A. on behalf of the ACB Scientific Committee. (2020) *Coronavirus and COVID-19: update from ACB Scientific Committee*. 23 March.<http://www.acb.org.uk/whatwesay/acb_newspage/2020/03/23/coronavirus-and-covid-19-update-from-acb-scientific-committee>  “From the Chinese population, lymphocytopenia was observed in 83% of cases, with thrombocytopenia in 36% and leukopenia in 34%. Biochemically, patients demonstrated high concentrations of CRP, less common elevations of AST, ALT, CK and D-dimer. Furthermore, in a systematic analysis of 11 PUBMED articles, Giuseppi Lippi and Mario Plebani have documented laboratory abnormalities reported in cases of COVID-195. In addition to the findings above from the Chinese cohort, patients may also present with decreased albumin, or increases in LDH, total bilirubin, creatinine, procalcitonin and also cardiac troponin and natriuretic peptides. The latter occurs in the more severe presentations of COVID-19 and is reflective of a cardio-inflammatory response and has been reported in fulminant myocarditis, successfully treated with glucocorticoid and human Ig6. Cardiac biomarkers could be utilised as a repeated metric of a worsening clinical scenario or an improving response due to Cardioprotective intervention.”  **Serum ferritin (discussed alongside other possible markers)**   * Zhou, B. et al (2020) Utility of Ferritin, Procalcitonin, and C-reactive Protein in Severe Patients with 2019 Novel Coronavirus Disease. [ResearchSquare pre-print] <https://www.researchsquare.com/article/rs-18079/v1> * Zhou, F. et al (2020) Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet*, 395(10229), pp. 1054-1062 <https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30566-3/fulltext>   **Other markers – platelets, lymphocytes, IL-6**   * Lippi, G. et al (2020) Thrombocytopenia is associated with severe coronavirus disease 2019 (COVID-19) infections: A meta-analysis. *Clinica Chimica Acta*, 506, pp. 145-8 <https://www.sciencedirect.com/science/article/pii/S0009898120301248> * Chen, G. et al (2020) Clinical and immunologic features in severe and moderate Coronavirus Disease 2019. *The Journal of Clinical Investigation* <http://www.jci.org/articles/view/137244/files/pdf> * Xhao, X. et al (2020) Incidence, clinical characteristics and prognostic factor of patients with COVID-19: a systematic review and meta-analysis [pre-print] <https://www.medrxiv.org/content/10.1101/2020.03.17.20037572v1> * Zhang, D. et al (2020) COVID-19 infection induces readily detectable morphological and inflammation-related phenotypic changes in peripheral blood monocytes, the severity of which correlate with patient outcome. [pre-print]   <https://www.medrxiv.org/content/10.1101/2020.03.24.20042655v1>   * Chen, G. et al (2020) Clinical and immunologic features in severe and moderate Coronavirus Disease 2019. The Journal of Clinical Investigation. [in-press preview] <https://www.jci.org/articles/view/137244> * Yuan, J. et al (2020) The correlation between viral clearance and biochemical outcomes of 94 COVID-19 infected discharged patients. Inflammation Research. <https://link.springer.com/article/10.1007/s00011-020-01342-0> * Ling, W. (2020) C-reactive protein levels in the early stage of COVID-19. Médecine et Maladies Infectieuses. [In Press, Journal Pre-proof] <https://www.sciencedirect.com/science/article/pii/S0399077X2030086X?via%3Dihub> * Liu, Y. et al (2020) Clinical and biochemical indexes from 2019-nCoV infected patients linked to viral loads and lung injury. Science China Life Sciences, 63, pp. 364-374. <https://link.springer.com/article/10.1007%2Fs11427-020-1643-8> |
| **Additional information** | **Cytokine storm**   * McGonagle, D., Sharif, K., O'Regan, A. and Bridgewood, C. (2020) The Role of Cytokines including Interleukin-6 in COVID-19 induced Pneumonia and Macrophage Activation Syndrome-Like Disease. Autoimmunity Reviews [in press, corrected proof] <https://www.sciencedirect.com/science/article/pii/S1568997220300926?via%3Dihub> * Yang, Y. et al (2020) Exuberant elevation of IP-10, MCP-3 and IL-1ra during SARS-CoV-2 infection is associated with disease severity and fatal outcome. MedRxiv [pre-print] <https://www.medrxiv.org/content/10.1101/2020.03.02.20029975v1> * Ma, J., et al (2020) Potential effect of blood purification therapy in reducing cytokine storm as a late complication of critically ill COVID-19. Clinical Immunology, p. 214 [correspondence]   <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7118642/>   * Zhang, C. et al (2020) The cytokine release syndrome (CRS) of severe COVID-19 and Interleukin-6 receptor (IL-6R) antagonist Tocilizumab may be the key to reduce the mortality. International Journal of Antimicrobial Agents. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7118634/> * Mehta, P. et al (2020) COVID-19: consider cytokine storm syndromes and immunosuppression. The Lancet, 395(10229), pp. 1033-1034 <https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30628-0/fulltext> |
| **Search strategy** | * EMBASE and Medline databases via NICE Healthcare Databases Advanced Search interface (<https://hdas.nice.org.uk>) * PubMed * Google-mediated general internet search * EPPI COVID-19: a living systematic map of the evidence <http://eppi.ioe.ac.uk/COVID19_MAP/covid_map_v5.html> |

***Any queries on specific drug regimens or dosages should be passed to Medicines Information, Pharmacy on x3030 (CGH) or x6108 (GRH). Library & Knowledge Services will endeavour to use the best, most appropriate and most recent sources of information available to it, but can make no warranty, express or implied as to the accuracy of any of the information or advice supplied.***

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