

## Endocrine and Metabolic Aspects of the COVID-19 Pandemic

Monica Manuel<sup>1\*</sup> and Andrea Marazuela<sup>2</sup>

**Received:** November 20, 2020; **Accepted:** December 04, 2020; **Published:** December 11, 2020

### Description

COVID-19 infection has tremendously impacted our daily clinical practice also as our social living organization. Virtually all organs and biological systems suffer from this new coronavirus infection, either because the virus targets directly specific tissues or due to indirect effects. Endocrine diseases aren't an exception and a few of endocrine organs are in danger of direct or indirect lesion by COVID-19. Although there's still no evidence of upper predisposition to contract the infection in patients with diabetes and/or obesity, the coexistence of those conditions contributes to a worse prognosis because both conditions confer an impaired immunologic system [1]. Cytokines storm are often amplified by these two latter conditions thereby resulting in multi-systemic failure and death. Glycaemic control has been demonstrated to be crucial to avoiding long hospital stays, ICU requirement and also prevention of excessive mortality. Endocrine treatment modifications as a consequence of COVID-19 infection are required during a proactive manner, so as to avoid de-compensation and eventual hospital admission [2].

Individuals with metabolic syndrome are at increased risk for poor disease outcomes and mortality from COVID-19. The pathophysiologic mechanisms for these observations haven't been fully elucidated. A critical interaction between SARS-CoV-2 and therefore the Angiotensin-Converting Enzyme 2 (ACE2) facilitates viral entry into the host cell [3]. ACE2 is expressed in pancreatic islets, vascular endothelium, and fat, and therefore the SARS-CoV-2-ACE2 interaction in these tissues, alongside other factors, governs the spectrum and therefore the severity of clinical manifestations among COVID-19 patients with metabolic syndrome. Moreover, the pro-inflammatory milieu observed in patients with metabolic syndrome may contribute toward COVID-19-mediated host immune deregulation, including suboptimal immune responses, hyper-inflammation, micro-vascular dysfunction, and thrombosis [4].

Individuals with diabetes could also be at increased risk of infections, especially influenza and pneumonia. This is often why all people with diabetes are recommended pneumococcal and annual influenza vaccinations. Type 2 DM (T2DM) seems to be a risk factor for acquiring the new coronavirus infection. Indeed, T2DM and hypertension are identified because the commonest comorbidities for other coronavirus infections, like Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS-CoV) [5]. consistent with several

<sup>1</sup>Department of Endocrinology, Autonomous University of Madrid, Madrid, Spain

<sup>2</sup>Institute of Endocrine and Metabolic Sciences Vita Salute San Raffaele University, Milan, Italy

### Corresponding author:

Monica Manuel, Department of Endocrinology, Autonomous University of Madrid, Madrid, Spain, Tel: 07994388944

✉ manuelmouni@uam.es

**Citation:** Manuel M, Marazuela A (2020) Endocrine and Metabolic Aspects of the COVID-19 Pandemic. *Endocrinol Metab Vol. 4 No.5:5*.

reports, including those from the Centres for Disease Control and Prevention (CDC), patients with T2DM and therefore the metabolic syndrome may need up to ten times greater risk of death once they contract COVID-19 (CDC Coronavirus Reports). Although T2DM and therefore the metabolic syndrome increase the danger of more severe symptoms and mortality in many infectious diseases, there are some additional specific mechanistic aspects in coronavirus infections that need separate consideration, which can have clinical consequences for improved management of patients who are severely affected.

Hyperglycaemia and a diagnosis of T2DM are independent predictors of mortality and morbidity in patients with SARS [6]. This finding might be thanks to these patients having a state of metabolic inflammation that predisposes them to an enhanced release of cytokines. For COVID-19, a cytokine storm (that is, greatly elevated levels of inflammatory cytokines) has been implicated within the multi-organ failure in patients with severe disease.

Metabolic inflammation also will compromise the system, reducing the body's ability to tackle the infection, impairing the healing process and prolonging the recovery. An animal model demonstrated that comorbid T2DM leads to immune deregulation and enhances disease severity following MERS-

CoV infection. During this work, diabetic mice expressing the human DPP4 (resulting in MERS-CoV susceptibility) exhibited an altered profile of cytokines, with increased expression of IL-17  $\alpha$  following infection [7]. These data support the hypothesis that the mixture of coronavirus infection and T2DM triggers a deregulated immune reaction, leading to a more aggravated and prolonged lung pathology.

## References

- 1 Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, et al. (2020) Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized With COVID-19 in the New York City area. *JAMA* 323: 2052-2059.
- 2 Zhou F, Yu T, Du R, Fan G, Liu Y et al. (2020) Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study. *Lancet* 395: 1054-1062.
- 3 Wu Z, McGowan JM. (2020) Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA* 323: 1239.
- 4 Deng SQ, Peng HJ. (2020) Characteristics of and public health responses to the coronavirus disease 2019 outbreak in China. *J Clin Med* 9: 575.
- 5 Alves C, Casqueiro J, Casqueiro J. (2012) Infections in patients with diabetes mellitus: A review of pathogenesis. *Indian J Endocrinol Metab* 16: 27.
- 6 Yang JK, Feng Y, Yuan MY, Yuan SY, Fu HJ, et al. (2006) Plasma glucose levels and diabetes are independent predictors for mortality and morbidity in patients with SARS. *Diabet Med* 23: 623-628.
- 7 Kulcsar KA, Coleman CM, Beck SE, Frieman MB. (2019) Comorbid diabetes results in immune dysregulation and enhanced disease severity following MERS-CoV infection. *JCI insight* 4: 20.