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Editorial

Diabetes and Covid 19: Current Status!

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The infection with coronavirus disease - 2019 (COVID-19) is a double risk for patients with diabetes. Diabetes has been stated to be a risk factor for the seriousness of the condition, whereas patients continue to regulate glucose in a situation of lower and more complex intake of food.

COVID-19 is caused by the coronavirus SARS-CoV-2 (severe acute respiratory syndrome coronavirus-2), which has spread rapidly to many more than 160 countries worldwide [1,2]. The mechanism for transmitting the virus is mainly through the transfer of respiratory droplets between humans [1]. The average incubation period is 5 days, accompanied by symptomatic illness lasting 1 - 2 weeks [3]. It is characterized by a wide range of symptoms including coughing, fever, myalgia and breathing problems like viral pneumonia, and respiratory failure. In the worst cases, these can lead to death [4-6]. The average duration from first hospitalizations has been 6 - 7 days [7-9]. A percentage of those infected are either without symptoms (but still infective) or who have mild symptoms [10-12].

Diabetes is a contributing factor for hospitalization and mortality of the COVID-19 infection. By analyzing intensive care and non-intensive care patients with COVID-19, there appears to be a double rise in the prevalence of patients with diabetes in intensive care [6]. Mortality in patients with diabetes has been around threefold higher relative to the general mortality of COVID-19 in China [3-12].

A predictor of mortality in COVID-19 is the number of comorbidities. Patients with diabetes are in fact a high-risk group for severe illness. In particular, diabetes was also a risk factor in previous SARS, MERS (Middle East Respiratory Syndrome) coronavirus infections and the 2009 severe influenza A H1N1 pandemic [13-15].

It is a reality that patients with diabetes are at higher risk of illnesses like influenza, and associated risks such as secondary bacterial pneumonia. Diabetes patients have impaired their innate immune response both in terms of cytokine profile and improvements in immune responses, particularly T-cell and macrophage activation [16]. Bad glycaemic regulation impacts many facets of the immune system to infectious infection, as well as possible secondary bacterial infection in the lungs [17]. It is probable that several of China's diabetes patients were in weak metabolic control as COVID-19 compromised.

Most people with type 2 diabetes are obese and obesity is also a contributing factor for serious infection [18,19]. During the influenza A H1N1 outbreak in 2009, it was found that the illness became more extreme and persisted longer in almost twice as many patients with obesity who were also handled in intensive care units relative to the history [14,20]. Specifically, greater risk is correlated with metabolic active abdominal obesity [19]. An excessive production of adipokines and cytokines such as TNF-alfa and interferon characterizes a persistent low-grade abdominal obesity and can cause an compromised immune response [21]. Patients with severe abdominal obesity may have mechanical breathing issues, with reduced ventilation of the basal lung parts raising the chance of pneumonia and reducing blood oxygen saturation [22]. Furthermore, obese patients have an elevated chance of asthma and some diagnosed with obesity and asthma show further complaints, further regular and serious exacerbations and reduced resistance to various asthma medicines [22].

Finally, diabetic complications such as diabetic kidney disease and ischaemic heart disease can make the situation more complicated for patients with diabetes, making them more frail and thereby increasing the severity of COVID-19 disease with the need for care such as acute dialysis. Some results show that COVID-19 could cause acute cardiac injury with heart failure, contributing to circulation deterioration [23].

Diabetes and hypertension are the commonest comorbidities to COVID 19. Both diseases are very often cured with inhibitors of the angiotensin converting enzymes (ACE). COVID-19 remains bound to target cells by an angiotensin-converting enzyme 2 (ACE2), which is expressed in the epithelial cells of the lungs, blood vessels and intestine [24,25].

The expression of ACE2 is increased in patients treated with ACE and angiotensin II receptor blockers [26]. Thus, it has been proposed that ACE2 expression could be elevated in these two classes of patients with hypertension and diabetes, which may promote COVID-19 infection and raise the likelihood of severe disease and number of fatalities.

Lack of control of glycaemia is a risk factor for severe conditions and negative outcomes. Nevertheless, the opposite is also true too and the risk of infection, including bacterial pneumonia, can be significantly lowered by good glycaemic control [27]. The concern is that infections lead to the loss of glycaemic control, so diagnosis of hyperglycaemia in patients with respiratory issues becomes complicated during intercurrent fever disease, inadequate food consumption, so usage of medications such as glucocorticoids. To retain maximum glycaemic regulation, it is needed more regular monitoring of blood glucose and consistent improvement in antidiabetic care after the determined glucose levels.

Metformin and SGLT-2 inhibitors with moderate to severe disease should be halted in patients with type 2 diabetes. For patients with reduced kidney function without a possibility of hypoglycaemia, dipeptidyl peptidase 4 (DPP-4) inhibitors and even linagliptin could be used. Sulphonylureas can provoke hypoglycaemia in patients with low calorie intake. It is unlikely to stop the long-acting GLP-1 receptor agonist which decreases appetite in sparse-eating patients and has a half-life of 1 week. In many patients with type 2 diabetes, the therapy with insulin will be recommended and needs to be started, which is complicated because with the time restricted for insulin instruction and titration. Patients previously diagnosed with basal insulin require quick-acting insulin with the bolus to reverse hyperglycaemia. Hospitals have expertise and technologies for managing patients during intercurrent illness, but in cases where time is limited, the time involved with maintaining labile glycaemic regulation is a big concern.

In patients with type 1 diabetes controlled with basal bolus or insulin pump treatment, insulin doses will be titrated through regular glucose and ketone testing to avoid hypoglycaemia in patients with decreased consumption of food with the introduction of fast-acting insulin corrective bolus to avoid extreme hyperglycaemia with ketoacidosis.

Hence, every patient with diabetes is a high-risk and complicated group of patients being treated for COVID19, with an increased need for hospitalization. Patients with diabetes need constant care to lower the chance of death. Diabetes patients must follow the general prevention advices of the authority to fully avoid the COVID-19 infections.

Disclosure Statement

The author declare that there are no conflicts of interest.

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