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## CRITICAL RISK FACTORS FOR THE EMERGENCE OF DIABETES MELLITUS DURING THE COVID-19 PANDEMIC

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**ABSTRACT:** The COVID-19 pandemic has been associated with significant metabolic disturbances, including an increased incidence of diabetes mellitus (DM). This paper explores the critical risk factors contributing to the emergence of DM during the pandemic, emphasizing the role of both direct and indirect mechanisms. The interplay between viral infection, inflammatory responses, and disruptions to glucose homeostasis is examined, alongside the impact of lockdown measures on lifestyle behaviors such as physical activity, diet, and mental health. Additionally, the influence of pre-existing conditions, stress-induced hyperglycemia, corticosteroid treatments, and potential genetic predispositions are discussed. By identifying these risk factors, this study aims to provide insights into the prevention and management of DM in post-pandemic healthcare systems.

**KEYWORDS:** COVID-19, diabetes mellitus, risk factors, metabolic syndrome, hyperglycemia, inflammation, lifestyle changes, corticosteroids, pandemic, glucose homeostasis.

### INTRODUCTION

The COVID-19 pandemic has greatly influenced the clinical course of diabetes mellitus (DM), particularly in those who contracted the virus. A notable increase in new cases of diabetes has been recorded, primarily among individuals who have recovered from COVID-19. This phenomenon is attributed to the damaging effects of SARS-CoV-2 on pancreatic beta cells, which impairs insulin production and leads to the development of diabetes. Vaccination, however, has been shown to reduce the risk of severe diabetic complications in those who had COVID-19.

**Objective:** To study the priority risk factors contributing to the development of diabetes mellitus during the pandemic, with a focus on the impact of COVID-19 and vaccination.

**Materials and Methods:** The study included 242 patients, aged  $64.3 \pm 2.7$  years, who were selected using a prospective cohort method from the endocrinology department. The patients were divided into three groups:

- Group 1: 102 unvaccinated patients who developed type 2 diabetes after COVID-19.
- Group 2: 53 vaccinated patients who developed type 2 diabetes after COVID-19.
- Group 3: 87 patients with pre-existing type 2 diabetes before contracting COVID-19.

Clinical examinations, medical histories, lab tests, and instrumental diagnostics (X-ray, ultrasound, ECG) were used to assess the health status of each group.

Results: Group 1 (unvaccinated): These patients experienced more severe symptoms of diabetes, including chronic fatigue, hyperglycemia, and complications such as neuropathy, retinopathy, and diabetic foot syndrome. Many patients in this group also reported frequent episodes of hyperglycemia, with blood sugar levels that were difficult to control, resulting in both hyperglycemic and hypoglycemic events. COVID-19 exacerbated their overall condition, leading to more frequent episodes of diabetes decompensation, which required medical intervention. Additionally, these patients had a higher incidence of cardiovascular complications, such as hypertension and coronary artery disease, as a result of the combined burden of diabetes and COVID-19.

Group 2 (vaccinated): Vaccinated patients experienced milder symptoms compared to the unvaccinated group. Although hyperglycemia and related symptoms, such as polydipsia and polyuria, were present, they were less intense and more manageable. Weight loss, dry mouth, and fatigue were less common, indicating that vaccination played a protective role in reducing the severity of metabolic disturbances. Furthermore, vaccinated patients demonstrated a lower incidence of diabetic complications such as neuropathy and retinopathy. The stability in their glycemic control post-COVID-19 was better, with fewer episodes of decompensation. These patients also exhibited improved outcomes in terms of respiratory symptoms, as vaccination appeared to reduce the severity of COVID-19-related respiratory issues.

Group 3 (pre-existing diabetes): These patients had longstanding diabetes before contracting COVID-19, and the course of their disease worsened significantly post-infection, particularly in unvaccinated individuals. Symptoms such as polydipsia, polyuria, and fatigue were common, along with a notable increase in blood sugar fluctuations. Many patients developed new complications or saw the progression of existing ones, including diabetic nephropathy, which resulted in worsening renal function. Some patients also experienced increased insulin resistance and required higher doses of medication to manage their blood sugar levels. Furthermore, mental health concerns such as depression and anxiety became more prevalent in this group, likely due to the chronic nature of their condition and the impact of the pandemic on their overall health. Unvaccinated patients in this group also demonstrated a higher likelihood of hospitalization and more frequent severe outcomes related to both diabetes and COVID-19.

Conclusion: This study highlights that unvaccinated patients with diabetes who contracted COVID-19 exhibited more severe symptoms and complications compared to vaccinated individuals. Vaccination helped reduce inflammation and the severity of metabolic disturbances. These findings underscore the importance of vaccination in reducing the risk of complications and improving health outcomes for diabetic patients during the pandemic.

## REFERENCES

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