New Onset of Type 1 Diabetes Mellitus in Children and Adolescents after COVID-19 Infection: A Clinical Review

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Diabetes mellitus (DM) and COVID-19 have reciprocal relationships. While diabetic patients have worse prognosis after contracting SARS-CoV-2 virus, the virus itself can cause new-onset diabetes in susceptible individuals. This clinical review describes multiple case reports, research, and epidemiological data demonstrating a link between COVID-19 and new-onset type 1 DM in children and adolescents. There are five proposed mechanisms that explain how COVID-19 can lead to new-onset DM. Pathway 1 induces generic autoimmunity that results in pancreatic beta-cell destruction. Pathway 2 involves the mis-regulation of the ACE2 and angiotensin II levels, which results in vasoconstriction and decreased blood supply to the pancreas resulting in destruction of the beta-cells and new-onset DM type 1. Pathway 3 explains the effect of cytokines on increased gluconeogenesis and beta-cells destruction. Pathway 4 suggests the correlation between stress and hyperglycemic hormone release, which may lead to metabolic imbalance. Pathway 5 explains how the medications involved in COVID-19 treatment may cause increased blood glucose concentrations triggering new-onset DM in predisposed individuals. The data analyzed in this research suggest an increased risk for new-onset type 1 diabetes in children and adolescents after contracting SARS-CoV-2 virus. It is highly recommended to prevent COVID-19 infection in this population by following CDC guidelines. This clinical review attempts to provide information to medical providers and general public regarding the possible COVID-19 sequelae of diabetes mellitus and DKA as well as importance of long-term monitoring of the patients after either symptomatic or asymptomatic COVID-19 infection.