

COVID-19 associated with increase in new diagnoses of type 1 diabetes in youth, by as much as 72%

September 23 2022



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Children who were infected with COVID-19 show a substantially higher risk of developing type 1 diabetes (T1D), according to a new study that

analyzed electronic health records of more than 1 million patients ages 18 and younger.

In a study published today in the journal *JAMA Network Open*, researchers at the Case Western Reserve University School of Medicine report that children and adolescents who contracted COVID-19 were more prone to developing T1D in the six months following their COVID diagnosis.

The findings showed a 72% increase in new diagnoses of T1D in COVID-19 patients 18 years old and younger—although the research emphasized that it is unclear whether COVID-19 triggers new onset of T1D.

About 187,000 children and adolescents younger than 20 live with T1D nationally, according to the Centers for Disease Control and Prevention (CDC).

"Type 1 diabetes is considered an autoimmune disease," said Pamela Davis, Distinguished University Professor and The Arline H. and Curtis F. Garvin Research Professor at the Case Western Reserve School of Medicine, a study corresponding author. "It occurs mostly because the body's immune defenses attack the cells that produce insulin, thereby stopping insulin production and causing the disease. COVID has been suggested to increase autoimmune responses, and our present finding reinforces that suggestion."

The team analyzed the de-identified [electronic health records](#) of nearly 1.1 million patients age 18 years and younger in the United States and 13 other countries diagnosed with the SARS-CoV-2 infection between March 2020 and December 2021 and also those diagnosed with a non-COVID-related respiratory infection during that same period.

The study population was further divided into two groups: patients up to age 9 years and those age 10–18 years. After careful statistical matching to account for age, demographics and family history of diabetes, there were 285,628 in each group for a total of 571,256 patients.

Study findings

The research team found that among the more than 571,000 pediatric patients:

- Within six months of SARS-CoV2 infection, 123 patients (0.043%) had received a new diagnosis of T1D, compared to 72 patients (0.025%) who received a new diagnosis following a non-COVID respiratory infection, an increase of 72% in new diagnoses.
- At one, three and six months following infection, the risk of diagnosis of T1D was substantially greater for those infected with SARS-CoV2 compared to those with non-COVID respiratory infections. Similar results were reported with patients in the infant-9-year-old and 10- to 18-year-old age groups.

"Families with high risk of type 1 diabetes in their children should be especially alert for symptoms of diabetes following COVID, and pediatricians should be alert for an influx of new cases of type 1 diabetes, especially since the Omicron variant of COVID spreads so rapidly among children," Davis said. "We may see a substantial increase in this disease in the coming months to years. Type 1 diabetes is a lifelong challenge for those who have it, and increased incidence represents substantial numbers of children afflicted."

Rong Xu, also a corresponding author, professor of Biomedical Informatics at the School of Medicine and director of the Center for Artificial Intelligence in Drug Discovery, said further research is needed

to examine if the increased risk of new onset T1D following SARS-CoV2 infection in [pediatric patients](#) will persist, who are vulnerable, and how to treat COVID-19 associated T1D in children.

"We are also investigating possible changes in development of type 2 diabetes in children following SARS-CoV2 infection," Xu said.

T1D is most common in children while type 2 diabetes (T2D) is known as "adult-onset [diabetes](#)" and develops over time, often as the patient becomes resistant to the effects of insulin and later, as the pancreas stops making enough insulin, according to the CDC.

The Case Western Reserve research team also included David Kaelber, professor of Internal Medicine, Pediatrics and Population and Quantitative Health Sciences, and medical students Ellen Kendall and Veronica Olaker.

Previous COVID-related studies led by the CWRU team have found that the [risk factor for Alzheimer's disease increases by 50–80% in older adults who caught COVID](#) and that [people with dementia are twice as likely to contract COVID](#).

More information: Association of SARS-CoV-2 infection with new onset type 1 diabetes in children, 2020-2021, *JAMA Network Open* (2022).

Provided by Case Western Reserve University

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