

# Near-fatal experience due to delayed diagnosis of type 1 diabetes during the COVID-19 pandemic

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## Case Report

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# Abstract

The focus of national governments and the medical profession on the pandemic of coronavirus disease 2019 (COVID-19) has resulted in neglect of care for children with new onset illnesses. Type 1 diabetes (T1D), the most common endocrine disorder in children, is prone to rapid deterioration if not diagnosed in time. We recently encountered a child who presented in a critical condition and was later diagnosed to have diabetic ketoacidosis. We discuss the circumstances arising out of the severe lockdown restrictions for COVID-19, which resulted in difficulties in accessing the healthcare services and caused significant delay in the diagnosis of T1D and a near-death experience. It is essential to keep the non-COVID healthcare services open for children with new onset illnesses and those with chronic conditions for timely access in order to reduce morbidity and mortality due to these conditions.

## Introduction

The pandemic of coronavirus disease 2019 (COVID-19) has caused unparalleled disruption of human lives during the modern era (1). Of the several countermeasures undertaken by national governments, the hardline restrictive measures or 'lockdown' of geographical territories within a country or the entire country has been claimed as a successful preventive action that helped reduce the spread or impact of pandemic (1). The lockdowns place severe restrictions on stepping out of homes, suspension of transport services, and closure of non-emergency services. Further, as the healthcare systems came under huge pressure to deal with or prepare for the COVID-19 battle, there was a virtual closure of non-COVID-19 care (1). In developing countries such as India, the lockdown also closed access to nearby registered and unregistered healthcare providers (HCP) in rural areas and urban slums, often the first point of contact for seeking medical advice (2). The medical professionals suddenly exposed to managing a deadly disease to which their own lives were at risk and of which they had no earlier experience, probably started viewing non-COVID-19 care as a burden (3). The fear of becoming infected with coronavirus at healthcare facilities forced people to prefer staying at home and suffer until their illnesses deteriorate significantly (4). All these factors may result in substantial reductions in healthcare utilization for non-COVID conditions, with consequences of worsening of the disease and even death. Experience during the Ebola epidemic suggests that the number of deaths due to non-Ebola conditions such as malaria, tuberculosis, measles, and HIV/AIDS exceeded deaths due to Ebola virus disease, as the healthcare systems failed to provide non-Ebola care (5). Similar to adults, children who suffer new non-COVID illnesses during the lockdown period are at risk of late diagnosis, disease deterioration, and probably death.

Type 1 diabetes (T1D) is a condition in which a delayed diagnosis may result in rapid worsening of illness with severe morbidity, including diabetic ketoacidosis (DKA), and even death. During the COVID-19 pandemic, the International Society for Pediatric and Adolescent Diabetes (ISPAD) has indeed received information from its members from China and Italy, the epicentres of COVID-19, about several cases of newly diagnosed T1D or DKA in children with known T1D who had delayed hospitalization due to the

closure of non-COVID-19 services (6). In addition, there were concerns that families were not seeking timely medical advice when children had symptoms of new-onset T1D or even DKA, resulting in presentations in severe DKA (6). There are, however no published reports of delay in T1D diagnosis resulting in serious consequences during the COVID-19 pandemic.

## Case Presentation

A 2½ yr-old, previously healthy girl, presented in a critical condition at our hospital. She was received on manual ventilation and was rapidly resuscitated for hemodynamic instability. A diagnosis of severe DKA was made based on the initial blood pH of 6.9, serum bicarbonate 4.8 mmol/L; blood glucose, 635 mg/dL, and blood ketone, 4.8 mmol/L. She was managed in the critical care unit and received inotropic support for 48 hrs, mechanical ventilation for 72 hrs and insulin infusion for 60 hrs and was transferred to endocrine services 5 days later for diabetes education. She also suffered non-oliguric renal failure (serum urea and creatinine 76 and 0.9 mg/dL, respectively) that improved subsequently. Her illness had begun 1 week back with low-grade fever, for which she was given medicines from the local HCP. The fever subsided in a day, but parents started observing an unusually excessive thirst and frequent urination for which they consulted the same HCP twice over two days and were provided reassurance. Over the next four days, the child became progressively lethargic. The parents could not seek further medical care due to closure of the only available local HCP shop due to the nationwide lockdown announced on March 24, 2020. Parents also expressed that they feared contracting the deadly coronavirus as hospitals were perceived as dangerous places to visit. A day prior to presentation, parents noticed fast breathing that continued to increase over the next few hours. She was taken to a private hospital in the nearby town, 10 kms from her residence, where she was declined care as the doctor perceived her respiratory symptoms to be due to COVID-19. Over the next few hours, parents frenetically shuffled between three more HCPs before they finally reached the district hospital located in a city approximately 30 kms away at 2 AM. She received an enema for non-passage of stools for the last 4 days and was sent home. Despite lockdown restrictions, the police allowed the movement of transport vehicle at several places in the city as the child looked obviously sick. As her condition deteriorated at home and her consciousness decreased, parents rushed her to a medical college hospital about 40 kms from their home. She was received there in a gasping state, was immediately intubated, initiated on hand ventilation and intravenous fluids, and referred to our center, at a distance of about 60 kms, citing non-availability of ventilator. The parents disclosed that the thought that she may not survive crossed their minds several times on their way to our hospital.

There was no history of early diabetes or any other autoimmune disorder in the family. The investigations showed HbA1c of 12.8%, fasting C-peptide 0.6 ng/mL, and positive glutamic acid decarboxylase-65 autoantibodies, confirming the diagnosis of T1D. She was initiated on a basal bolus insulin regimen and discharged home after completion of diabetes education. An informed consent was obtained from the parents for conducting the laboratory studies and for publishing clinical information.

## Discussion

The highlight of our report is the significant delay in the diagnosis of T1D in our patient, which resulted in severe DKA and a near-death experience. Although children presenting with severe DKA are not uncommon occurrence, the fact that the diagnosis of diabetes was not considered at all prior to presentation is unusual. Ours is a tertiary care referral center for pediatric T1D that receives patients from most states located in Northern India (7). Most children with T1D referred to us have already been diagnosed elsewhere. However, in the present case, a combination of factors probably resulted in the late diagnosis of T1D. The foremost was the restrictions placed on outdoor movement after a complete country-wide lockdown and the fear arising out of aggressive media campaigning that projected hospitals as places where people may get infected with the deadly coronavirus. These factors prevented the parents to seeking medical advice for 4 days despite perceiving deterioration in the child's condition. Other factors that operated in delaying the diagnosis are quite typical of the healthcare systems of a developing country where access to healthcare among the rural and urban slum populations remains limited (2, 8). The COVID-19 pandemic has further shaken this fragile healthcare system (2, 8). The care of children with T1D, in particular, is a compromised one with very few trained healthcare professionals, limited hospital facilities, and a poor awareness and knowledge of both parents and HCPs, which often results in delays in diagnosis and death before diagnosis even during pre-COVID times (9). This happens even as India recently achieved the dubious distinction of being ranked first in the countries of the world for the number of incident cases of T1D in children and adolescents (10). The fact that the index patient remained undiagnosed at two major healthcare facilities in the region underlines the lack of physician awareness about T1D in addition to the lack of attention that non-COVID-19 patients are facing during this time. It also highlights the lack of access to emergency care at nearby hospitals during the lockdown. The mental trauma suffered by parents, especially about the prospect of death of their only child, can however never be assessed and reversed.

Several reputed organizations such as the Royal College of Paediatrics and Child Health and ISPAD have responded to the evolving COVID-19 situation with revised advisories to their governments as well as patients for a timely access to non-COVID-19 care (4, 6). It is therefore important that all countries make suitable modifications to COVID-19 restrictions, re-open essential non-COVID care, and take measures to allay peoples' fears regarding hospital visits, so that children suffering from new onset illnesses, especially T1D or other chronic conditions, have access to healthcare well in time and before their illness worsens irreversibly.

## Declarations

**Statement on ethics:** The relevant ethical guidelines have been followed. The approval from the Departmental Review Board has been obtained. Necessary parental consent has been obtained.

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