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# BMJ Paediatrics Open

## Presentation of newly diagnosed type 1 diabetes in children and young people during COVID-19 : a national UK survey

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Complete List of Authors:	Ng, Sze; Southport and Ormskirk Hospital NHS Trust, Paediatrics; University of Liverpool School of Life Sciences, Woodger, Katherine Regan, Fiona; Wexham Park Hospital, Paediatrics Soni, Astha; Sheffield Children's Hospital NHS Foundation Trust, General Medicine Wright, Neil; Sheffield Children's Hospital, Paediatric Endocrinology & Diabetes Agwu, Juliana; Sandwell and West Birmingham Hospitals NHS Trust, Paediatrics Williams, Eleri; Hampshire Hospitals NHS Foundation Trust Timmis, Alison; Countess of Chester Hospital NHS Foundation Trust Kershaw, Melanie; Birmingham Children's Hospital NHS Foundation Trust Moudiotis, Christopher; Royal Devon and Exeter NHS Foundation Trust, Paediatrics Drew, Josephine; Nottingham University Hospitals NHS Trust, Paediatrics
Keywords:	Endocrinology, Epidemiology, Health services research

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## Abstract

In the UK, there have been reports of significant reductions in paediatric emergency attendances and visits to the general practitioners due to COVID-19. A national survey undertaken by the UK Association of Children's Diabetes Clinicians found that the proportion of new onset Type 1 Diabetes (T1D) presenting with diabetes ketoacidosis during this COVID-19 pandemic was higher than previously reported and there has been an increase in presentation of severe DKA at diagnosis in children and young people under the age of 18 years. Delayed presentations of T1D have been documented in up to 20% of units with reasons for delayed presentation ranging from fear of contracting COVID-19 to an inability to contact or access a medical provider for timely evaluation. Public health awareness and diabetes education should be disseminated to healthcare providers on the timeliness of referrals of children with T1D.

## MANUSCRIPT

Diabetes is a significant cause of morbidity and mortality in patients with COVID-19. The recent national diabetes and mortality data in England reported that adults with Type 1 (T1D) had 3.5 times the odds respectively of dying in hospital with COVID-19 compared to those without diabetes[1]. In the UK, there have been reports of significant reductions in paediatric emergency attendances due to COVID-19. The national survey undertaken by the UK Association of Children's Diabetes Clinicians aims to review the impact of COVID-19 on diabetes ketoacidosis presentations across the country.

All diabetes units caring for children and young people (CYP) in England, Wales, Scotland and Northern Ireland and those submitting data to the National Paediatric Diabetes Audit (NPDA) were invited to complete a questionnaire (via Google forms) relating to history given to the clinical teams of presentation type 1 diabetes between 1<sup>st</sup> of March 2020 to 30<sup>th</sup> of June 2020. Responses were received from 88 units, 76 from England, 10 from Wales and 2 from Northern Ireland (Table 1).

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3 The survey showed that 450 CYP were newly diagnosed with T1D between the 1st  
4 March 2020 to 30th June 2020. The majority of centres (84%) had at least one patient  
5 admitted as newly diagnosed T1D (mean 5 cases per unit, range 0-30). 88% of centres had 1-  
6 10 DKA admissions with 71% having 1-10 severe DKA cases. Of all patients presenting as  
7 newly diagnosed T1D, 51% presented in DKA and 54% of presented with severe DKA  
8 (defined as pH <7.1). During this time period no children with T1D died as a result of DKA.  
9 In all units, 20% of newly diagnosed T1D were reported to have had a delayed presentation  
10 due to COVID-19.  
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12 The reasons for delayed reporting of presentation were grouped into themes (Table 2).  
13 Fear of COVID-19 was reported in 40% of cases. Issues regarding the inability to access GP  
14 services as well as limited GP services with no face-to-face reviews were reported in 22% of  
15 cases, whilst 7% had issues accessing secondary care units due to advice not to attend by  
16 NHS111 or the GP. Finally, 17% of cases reported a delayed presentation due to symptoms  
17 being misdiagnosed or not recognised as diabetes such as: symptoms mistaken for a  
18 respiratory illness during a GP video consultation, tiredness due to lack of routine and  
19 increased thirst attributed to a “heat wave” by the family.  
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21 While in non-COVID-19 times, there would be still be delays in presentation, the  
22 proportion of new onset T1D in CYP under 18 years presenting in DKA (51%) during this  
23 COVID-19 period was higher than previously reported of 38% in the UK around the same  
24 time period [2]. While in comparison, the percentage of DKA in newly diagnosed cases prior  
25 to COVID-19 had remained constant over 10 years at 26.3% in Germany[3, 4]. The  
26 proportion of those in DKA presenting as severe DKA was high at 54% while the 2017  
27 NPDA reported that 26% of newly diagnosed presented in DKA but no data was available for  
28 those presenting in severe DKA[5]. Increases in DKA and severe DKA at diagnosis in  
29 children during the COVID-19 pandemic were reported in Germany and delayed access of  
30 care provisions have been reported globally[4]. In our report, delayed presentation has been  
31 documented in 20% of units. Reasons for delayed presentation have ranged from fear of  
32 contracting COVID-19 to an inability to contact access a medical provider for timely  
33 evaluation. Limitations from this report was reliance on professional’s recall as to the number  
34 of presentations delayed due to COVID-19 and the reasons for their delay.  
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36 The global epidemiological and clinical patterns of COVID-19 among children with  
37 diabetes are still very limited. Further emphasis should ne made on the dissemination of  
38 education to healthcare providers regarding the timeliness of referrals of children with T1D.  
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## 10 REFERENCES

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**Table 1 Response to the questionnaire on newly diagnosed type 1 children or young people and diabetes ketoacidosis presentations**

	<b>Number of units returning survey</b>	<b>Newly diagnosed Type 1 children or young people</b>	<b>DKA presentations</b>	<b>Severe presentations of DKA (pH &lt;7.1)</b>	<b>Deaths</b>	<b>Delayed presentations due to COVID-19</b>
Regions	Total number	Total number (mean)	Total number (% of new presentations)	Total number (% of new presentations)	Total number (% of new presentations)	Total number (% of new presentations)
England	76	399 (5.2)	205 (52)	108 (27)	0 (0)	82 (20)
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Northern Ireland	2	16 (8.0)	7 (44)	4 (25)	0 (0)	2 (13)
<b>Total</b>	<b>88</b>	<b>450</b>	<b>231 (51)</b>	<b>124 (28)</b>	<b>0 (0)</b>	<b>89 (20)</b>



**Table 2 Reasons for delayed presentations**

	<b>Fear of Covid-19, %</b>	<b>Inability to access GP or limited GP service, %</b>	<b>Inability or discouraged to attend hospital A&amp;E or inpatient unit after contacting NHS111, %</b>	<b>Symptoms misdiagnosed or not recognised as diabetes, %</b>
<b>England</b>	36	22	5	13
<b>Wales</b>	3	0	1	4
<b>Northern Ireland</b>	1	0	1	0
<b>Total</b>	<b>40</b>	<b>22</b>	<b>7</b>	<b>17</b>

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## Abstract

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<b>England</b>	35	22	5	13
<b>Wales</b>	3	0	1	5
<b>Northern Ireland</b>	1	0	1	0
<b>Total</b>	40	22	7	17

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