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DIABETIC Medicine

LETTER

Service restriction during the COVID-19 pandemic and its impact on HbA_{1c}: a surprising outcome

The COVID-19 pandemic has disrupted diabetes services significantly, with staff redeployed to help shore up ward capacity. This, combined with advice on staying at home, resulted in people not being able to access diabetes care in the way that is recommended [1]. There has been concern about the impact this has had on patients' health, and targeted care for the most vulnerable may need to be introduced.

The adverse consequence of having diabetes on mortality from COVID-19 infection has been widely reported [2]. This will have heightened anxiety amongst people with diabetes who are already struggling with general anxieties surrounding day-to-day living with a chronic condition. The fear of contracting COVID-19 has led to people not wanting to shop for food and not wishing to attend family practices or hospitals, thereby potentially reducing their access to health advice and medicines [3]. Telephone and virtual consultations have replaced face-to-face contact, but this is not always successful. Older individuals and those with disabilities, such as hearing impairment, cannot always use remote access. Furthermore, working from home, being furloughed and the closure of gyms and swimming pools will have changed people's lifestyles and impacted their health. There are some reassuring data on the effect of this disruption on glycaemia, but only in people with type 1 diabetes, with improvements reported during lockdown thought to reflect reduced variability and more regular eating patterns [4,5].

Due to these concerns, we performed an evaluation to assess our population's diabetes care status, using HbA_{1c} as a surrogate. We compared 'pre-pandemic' data [Q4 (October to December) 2019] data with 'pandemic' data [Q2 (April to June) 2020]. Our expectation was that glycaemia would be better pre-pandemic and that there would be a rise in HbA_{1c} levels during the pandemic as a result of restricted access to diabetes care provision.

Data were accessed from the hospital biochemistry system with prior approval from the hospital Clinical Effectiveness Team. Data were analysed using SPSS (version 23) and a paired sample *t*-test. Data included people who had an HbA_{1c} level taken both in Q4 2019 and Q2 2020. The total number of people included in this analysis was 2497, and their mean (range) age was 67 (11–97) years. The male to female ratio was 56%: 44%. We assessed and compared HbA_{1c} change from Q4 2019 to Q2 2020 in people with presumed diabetes [HbA_{1c} ≥48 mmol/mol (6.5%)] and additionally in those who had a risk of developing diabetes, that is, those with presumed impaired glucose tolerance [HbA_{1c} 42–47 mmol/mol (6.0–6.5%)].

The results, summarized in Table 1, indicate that, for people with diabetes, HbA_{1c} did not in fact deteriorate between Q4 2019 and Q2 2020. This was in contrast to the results in people who had impaired glucose tolerance. These individuals were found to have an increase in measured HbA_{1c}, from a mean of 44 mmol/mol to a mean of 46 mmol/mol. We considered whether this was a unique occurrence or a seasonal change by comparing data for Q4 2018 with data for Q2 2019 and found virtually identical mean HbA_{1c} values for our population tested at those times. This would suggest the difference between Q4 2019 and Q2 2020 was not a consequence of seasonal variation.

The results were contrary to our initial hypothesis, however, are in line with recently published data for people with type 1 diabetes, which show that glycaemia improved during the lockdown period [4,5]. It will be reassuring for the individuals with diabetes and for service providers, that there has not been a deterioration in glycaemia as measured by HbA_{1c} in this period. It is possible that early identification of those with high HbA_{1c} in our region, who received ongoing support from our diabetes team, ensured that these people were helped sufficiently. In addition, it is possible that the early warnings about adverse outcomes from COVID-19 in diabetes were heeded and people took additional care with medication and lifestyle to produce a positive impact.

People with impaired glucose tolerance, however, may not have been aware of this diagnosis or perhaps were less conscious of the need to embrace helpful lifestyle changes. The link with obesity and adverse outcomes from COVID-19 [6] has prompted a push from Public Health and other Government agencies to promote improved lifestyles to prompt better outcomes if there is a second wave of the pandemic. Our data on the increase in HbA_{1c} in people with impaired glucose tolerance is supportive of this message to try and urgently reduce obesity in our population by encouraging lifestyle changes and medical care where needed.

This observational analysis has several limitations. We assessed HbA_{1c} change only in those for whom we

TABLE 1 HbA_{1c} levels in people with diabetes and people with impaired glucose tolerance in Q4 2019 and Q2 2020

	People with diabetes, *n* =1927	People with impaired glucose tolerance, *n* = 570	Both groups combined, *n* = 2497
Q4 2019			
Mean ± SD HbA_{1c}			
mmol	66 ± 16.1	44 ± 1.7	61 ± 16.9
%	8.2	6.2	7.7
Q2 2020			
Mean ± SD HbA_{1c}			
mmol	65 ± 17.4	46 ± 8.4	61 ± 17.8
%	8.1	6.4	7.7
P	0.005	<0.001	0.11

Note: Change in HbA_{1c} levels was assessed using paired sample *t*-tests.

had paired measurements from Q4 2019 and Q2 2020 and therefore captured only a proportion of our population known to have diabetes (18 000 people). It is possible that our data reflect those accessing healthcare more readily or those who were already receiving support from our diabetes team and hence had their HbA_{1c} levels measured. Due to the observational nature of the analysis, we were unable to differentiate based on type of diabetes, to separate those with tightly controlled diabetes who may have been included in our impaired glucose tolerance group, or to take account of factors such as hypoglycaemia that are known to improve HbA_{1c} but worsen diabetes management. The effect of deprivation on access to healthcare is also known to influence diabetes outcomes [7], but we were not able to differentiate our data based on locality, so socio-economic influences cannot be accounted for. Nevertheless, our findings highlight important considerations and may be areas for future analysis.

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