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LETTER

Interest in hybrid closed loop is high across the socioeconomic spectrum despite current inequalities in provision in a large UK diabetes centre

The rapidly evolving field of closed loop technology promises to revolutionise the management of type 1 diabetes.¹ Several systems are now commercially available in the United Kingdom and are supported by a robust evidence base.^{2,3} Currently only 3.8% (190/4952) of adults with type 1 diabetes within our health board (NHS Lothian) are on hybrid closed loop (HCL) systems. Of current HCL users, only 6.3% belong to the most deprived Scottish Index of Multiple Deprivation (SIMD) quintile whilst 37.4% belong to the most affluent quintile. 70% of HCL users are female (explained, in part, by use commenced in pregnancy).

To help gauge interest in diabetes technologies (and HCL in particular), we sent a questionnaire to all 2210 people with type 1 diabetes attending Royal Infirmary of Edinburgh clinics (the largest diabetes clinic within NHS Lothian). As the primary purpose of this exercise was service planning and delivery, ethical approval was not

required. There were 782 respondents (35.4% response rate). Responders were older (51 years [36–63] vs. 43 [29–58], $p < 0.001$), had lower HbA1c (60 mmol/mol [52–69] vs. 66 [57–79], $p < 0.001$), were more likely to be CSII users (30.5% vs. 16.3%, $p < 0.001$) and were more affluent (SIMD 5 response 43.5% vs. SIMD 1 response 24.9%, $p < 0.001$).

Of those not currently using continuous subcutaneous insulin infusion (CSII), 48.2% (274/568) expressed an interest in using this technology. Of those not currently using HCL, 66.5% (485/729) expressed an interest in HCL use. Lower age was strongly associated with interest in HCL (47 years [33–59] vs. 58 [46–68], $p < 0.001$). Current CSII users and Freestyle Libre users were significantly more likely to express an interest in using HCL as were those with positive anxiety (GAD-2) and depression (PHQ-2) scores (Table 1). The only significant difference in CGM

TABLE 1 Comparison of clinical and demographic features between those expressing an interest in HCL and those not interested in HCL use.

	Interested in HCL (%)	Not interested in HCL (%)	<i>p</i>
CSII user	94.4	5.6	
CSII non-user	57.6	42.4	<0.001
GAD-2 positive	81.3	18.7	
GAD-2 negative	63.4	36.6	<0.001
PHQ-2 positive	77.0	23.0	
PHQ-2 negative	64.3	35.7	0.004
Freestyle libre user	69.2	30.8	
Freestyle libre non-user	43.2	56.8	<0.001
Male	65.4	34.6	
Female	67.9	32.1	0.483
SIMD 1 & 2	68.0	32.0	
SIMD 3, 4 & 5	65.8	34.2	0.569
HbA1c <58 mmol/mol	66.5	33.5	
HbA1c ≥58 mmol/mol	66.4	33.6	0.994

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parameters was standard deviation of glucose, which was higher in people with an interest in HCL (3.4 mM vs. 3.2 mM, $p = 0.033$), and C-peptide was lower in people with an interest in HCL (4 pM [$<4-30$] vs. 10 [$<4-117$], $p = 0.008$). Importantly, baseline HbA1c and socioeconomic deprivation were not associated with interest in HCL. The following parameters were independently associated with interest in HCL, in logistic regression analysis: CSII user (OR 11.3 [95% CI 6.1–23.5], $p < 0.001$), Freestyle Libre user (OR 3.1 [95% CI 1.8–5.8], $p < 0.001$), age (0.97 per year [95% CI 0.96–0.98], $p < 0.001$) and positive GAD-2 anxiety screen (OR 2.3 [95% CI 1.4–4.0], $p = 0.002$).

Current provision of HCL is significantly skewed towards adults with lower levels of socioeconomic deprivation within our centre, which is in accordance with work we have previously published, indicating a strong relationship between SIMD and access to CSII.⁴ However, the data presented here are important in highlighting that interest in HCL is not influenced by socioeconomic deprivation, baseline HbA1c or gender (despite associations with current utilisation of HCL). The association between higher anxiety levels and demand for HCL suggests that many may see this technology as a tool in reducing their treatment burden. It is well established that those with the highest HbA1c stand to benefit the most from HCL with respect to HbA1c lowering.⁵ It is, therefore, essential that neither unduly restrictive eligibility criteria nor unconscious bias among healthcare professionals limits access to HCL, thereby widening existing socioeconomic inequalities in outcomes in type 1 diabetes.

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DATA AVAILABILITY STATEMENT

Research data are not shared.

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