

# INCIDENCE AND FACTORS ASSOCIATED WITH RESTORATION OF HYPOGLYCAEMIA AWARENESS IN ADULTS WITH TYPE 1 DIABETES TREATED WITH HYBRID CLOSED-LOOP IN THE UNITED KINGDOM



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Alexandros L Liarakos<sup>1,2</sup>, Thomas SJ Crabtree<sup>1,2</sup>, Tomás P Griffin<sup>3,4</sup>, Yew W Yap<sup>5</sup>, Parth Narendran<sup>6,7</sup>, Muhammad Ali Karamat<sup>8</sup>, Geraldine Gallen<sup>9</sup>, Sufyan Hussain<sup>10,11</sup>, Jackie Elliott<sup>12,13</sup>, Lalantha Leelarathna<sup>14</sup>, Alistair Lumb<sup>15,16</sup>, Robert EJ Ryder<sup>17</sup>, Pratik Choudhary<sup>3,4</sup>, Emma G Wilmot<sup>1,2</sup>

1. University Hospitals of Derby and Burton NHS Trust, 2. University of Nottingham, 3. University Hospitals of Leicester NHS Trust, 4. University of Leicester, 5. Aintree University Hospital, 6. Queen Elizabeth Hospital, 7. University of Birmingham, 8. Heartlands Hospital, 9. King's College Hospital NHS Trust, 10. Guy's and St. Thomas' NHS Trust, 11. King's College London, 12. Northern General Hospital, 13. University of Sheffield, 14. Manchester Royal Infirmary, 15. Oxford Centre for Diabetes Endocrinology and Metabolism, 16. National Institute for Health and Care Research, Oxford Biomedical Research Centre, 17. Sandwell & West Birmingham Hospitals NHS Trust

## Background and aims:

The NHS England hybrid closed loop (HCL) pilot provided access to HCL for adults with type 1 diabetes (T1D), managed with an insulin pump and intermittently scanned continuous glucose monitoring, with a HbA1c  $\geq 69$ mmol/mol (8.5%). We assessed the incidence and influencing factors of hypoglycaemia awareness (HA) restoration in those with impaired awareness of hypoglycaemia (IAH) from the pilot.

## Methods:

Anonymised baseline and follow-up data were collected via the ABCD audit tool. We performed logistic regression on several variables.

Figure 1. Restoration of hypoglycaemia awareness after HCL initiation

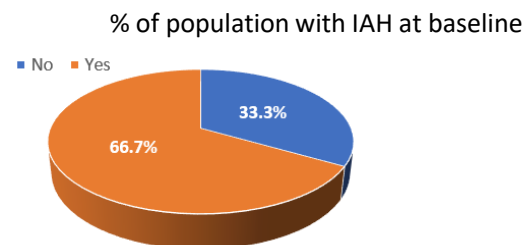


Table 1. Associations between various characteristics and restoration of hypoglycaemia awareness

Variable	Univariate	
	OR	P-Value
Age	0.97	0.16
Gender, Female	0.19	<b>0.035</b>
Ethnicity, White British	0.55	0.49
Multiple deprivation index	1.2	0.15
Diabetes duration	0.97	0.23
Duration of insulin pump therapy at baseline	0.97	0.50
Total daily dose of insulin (baseline)	1.01	0.26
HbA1c, mmol/mol (baseline)	0.98	0.40
Time in range, % (3.9-10mmol/L or 70-180mg/dL) (baseline)	1.01	0.50
Time below range, % (<3.9mmol/L or <70mg/dL) (baseline)	1.09	0.40
% coefficient of variation (baseline)	1.06	0.13
Number of sensor scans/day (baseline)	1.06	0.43
Gold score (baseline)	0.53	<b>0.016</b>
Diabetes distress scale score (baseline)	0.81	0.27
% time in closed loop	1.003	0.88
Change in HbA1c from baseline, mmol/mol	1.02	0.45
Variable	Multiple	
	OR	P-Value
Gender, Female	0.12	<b>0.013</b>
Gold score (baseline)	0.43	<b>0.005</b>

## Results:

- 78 Individuals (24 centres) with IAH (Gold  $\geq 4$ ) at baseline, with paired baseline and follow-up Gold score data were included.
- 76.9% female; 79.5% White; age  $39.8 \pm 13.9$  years; diabetes duration  $22.6 \pm 11.0$  years; baseline HbA1c  $77.6 \pm 8.2$ mmol/mol; (no severe hypoglycaemic events 12 months before HCL start).
- After  $13.2 \pm 9.5$  months, HA was restored (Gold  $< 4$ ) in 52/78 (66.7%) (group A) and remained impaired in 26/78 (33.3%) (group B) (Figure 1).
- Compared with group B, Group A had a lower baseline Gold score ( $4.6 \pm 0.8$  vs  $5.2 \pm 1.1$ ,  $p=0.01$ ); no other significant between-group differences (including time-in-range or time-below-range at baseline or follow-up) were observed.
- Gender and baseline Gold score were the only factors associated with HA restoration (Table 1).

## Conclusions:

HCL was associated with HA restoration in T1D, irrespective of glucose levels or diabetes duration. Additional therapeutic interventions are required to further improve IAH in real-world HCL users.

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