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Introduction

Some of the published randomized control trials of hybrid-closed loop (HCL) therapy have demonstrated weight-gain that may be a cause for concern for users and clinicians^{1,2}. The NHS England pilot launched in 2021 and funded access to HCL for individuals using pump therapy, FreeStyle Libre 2 (intermittently scanned) and with a HbA1c \geq 69mmol/mol. The audit aimed to capture real-world outcomes from this cohort and provide evidence to support the further rollout of HCL within the NHS.

This analysis reports weight outcomes at 12-months, and any links to changes in HbA1c and total daily insulin dose (TDD).

Methods

Data were extracted from the secure online tool. Available paired data for weight at baseline, 6 and 12-months follow-up were analysed using multivariate linear regression. Additionally, the association between weight change, total daily dose and baseline HbA1c were explored.

Results

Data for 273 individuals were included, with mean \pm SD age 39.6 \pm 14.0years, diabetes duration 23.2 \pm 11.6years, baseline HbA1c 77.8 \pm 10.0mmol/mol and weight 80.3 \pm 17.1kg. In total, 67.4% were female and 91.8% were white. Mean \pm SD follow-up time 12 \pm 2.4 months.

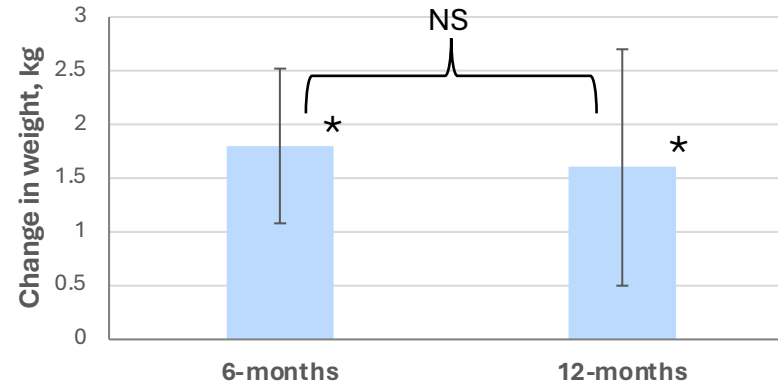
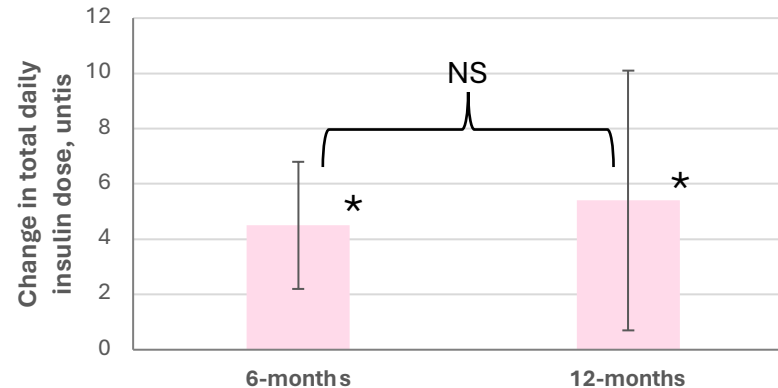


Figure 1. (above) Change in weight from baseline at 6- and 12-months, error bars representing 95% confidence intervals

Legend

* =P<0.05; NS=Not significant

Figure 2. (below) Change in total daily insulin dose from baseline at 6- and 12-months, error bars representing 95% confidence intervals



Results (cont.)

Weight increased from baseline to 6-months by 1.8kg (95% CI 1.0-2.5; P<0.001) and to 12-months by 1.6kg (95% CI 0.5-2.7; P<0.001) (**Fig 1.**). No change in weight was noted between 6 and 12-months following HCL commencement (P=0.9). There was no correlation between HbA1c change or baseline HbA1c and weight gain (P>0.15 for both). Weight correlated positively with total daily dose (β 0.18; P<0.001) at 12-months – those who had larger increases in TDD gained more weight. Total daily dose increased by 5.4units at 12-months (95% CI 0.7-10.1; P=0.02) (**Fig 2.**).

Discussion

Mild weight increases are observed by 6-months following commencement of HCL and then plateau. Weight gain correlates with increased TDD but not with HbA1c. Possible mechanisms for this require exploration. Additional support for HCL users to mitigate the impact of weight gain may be needed and could be considered as a future target for research.

References

1. S Garg et al., *DTT* 2017
2. M Tauschmann et al, *The Lancet* 2018

Conflict of interests

TSJC has received personal fees from Insulet, Abbott Diabetes Care, Dexcom, Sanofi, Lilly, NovoNordisk. COI for other authors are recorded online.