Effect of whey protein ingestion on overnight glycaemia in adults with type 1 diabetes

Aim: Overnight hypoglycaemia is a significant problem for people with type 1 diabetes (T1D). Given the glucagon-stimulating effect of whey protein, this study aimed to characterise the impact of whey protein ingestion on overnight glycaemia in T1D.

Methods: On two occasions, 13 adults (7F/6M) with T1D (Age: 51.3±13.2y; Weight: 88.4 ± 28.6kg; Diabetes duration: 26.8 ± 17.5y) using insulin pumps and CGM ingested either: 200mL water (control) or one of i) 0.25g/kg whey protein (n=9) or ii) 0.5g/kg whey protein (n=4), in the postabsorptive state immediately pre-bedtime. A fixed basal insulin rate was implemented overnight.

Results: Compared to control, the overnight glucose iAUC was greater for both 0.25g/kg (422.0 ± 174.2 versus -358.4 ± 189.1 mmol/l/min) and 0.5g/kg of whey protein (335.4 ± 310.1 versus -569.4 ± 196.0 mmol/l/min). Peak change in glucose was similar between 0.25g/kg and 0.5g/kg whey protein (2.5 ± 3.5 versus 2.3 ± 4.0 mmol/L, respectively), as was time-to-peak glucose (252.0 ± 93.2 versus 258.8 ± 117.1 minutes, respectively).

Conclusion: In adults with T1D using subcutaneous insulin delivered on a fixed basal rate overnight, protein ingestion resulted in a moderate but prolonged increase in glycaemia for at least 6 hours. This provides initial data demonstrating the potential for whey protein to mitigate overnight hypoglycaemia in T1D.

