Continuous Glucose Monitoring to investigate chronic abdominal pain and gastrointestinal symptoms after Roux-en-Y Gastric bypass

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The authors declare no conflict of interest.

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Background/Aim

- Abdominal pain (AP) and post-bariatric hypoglycemia (PBH) are common after obesity surgery

- The aim was to explore if there was a relationship between AP and PBH more than ten years after the operation (RYGB), and whether continuous glucose monitoring (CGM) with dietary intervention has an educational role to reduce symptoms.

Methods - Study design

Visit 1

- Blood tests
- Anthropometric measurements
- Digital questionnaires
  GSRS (Gastrointestinal Symptom Rating Scale) and
  DSS (Dumping Severity Score)
- Interview

Visit 2

- Intervention with low glycemic index and low carbohydrate diet

Visit 3

- Blood tests
- Anthropometric measurements
- Digital questionnaire
  GSRS and DSS
- Interview

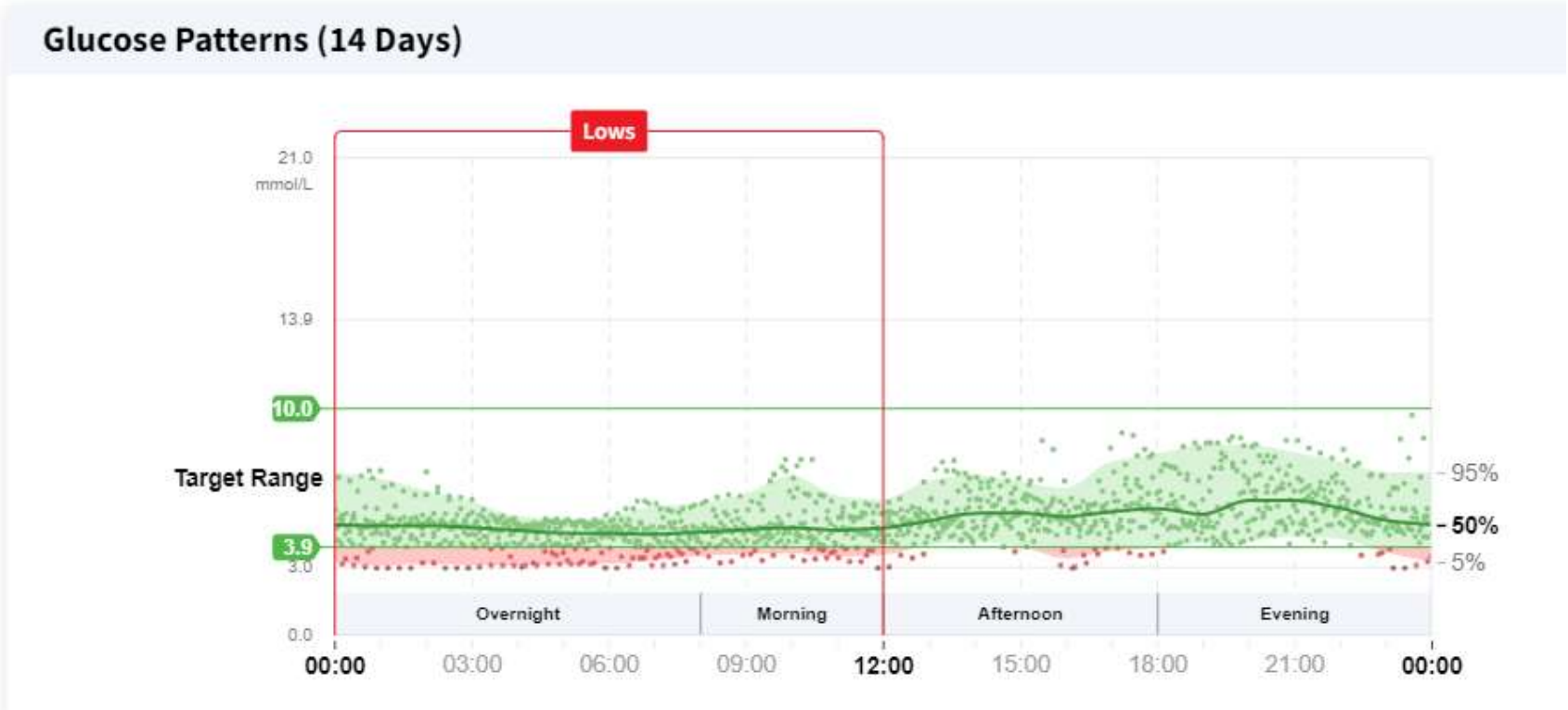
Run-in period 2 weeks with CGM

Intervention period 2 weeks with CGM

Characteristics of the participants

	Mean (SD)
Women	N=22
Time since RYGB (years)	14.5 (1.4)
Preoperative age (years)	39.6 (7.7)
Present age (years)	54.6 (7.7)
Preoperative BMI (kg/m^2)	42.0 (4.0)
Present BMI (kg/m^2)	28.9 (6.0)

After 14 days with CGM an ambulatory glucose profile (AGP) was generated, reporting mean glucose for the period



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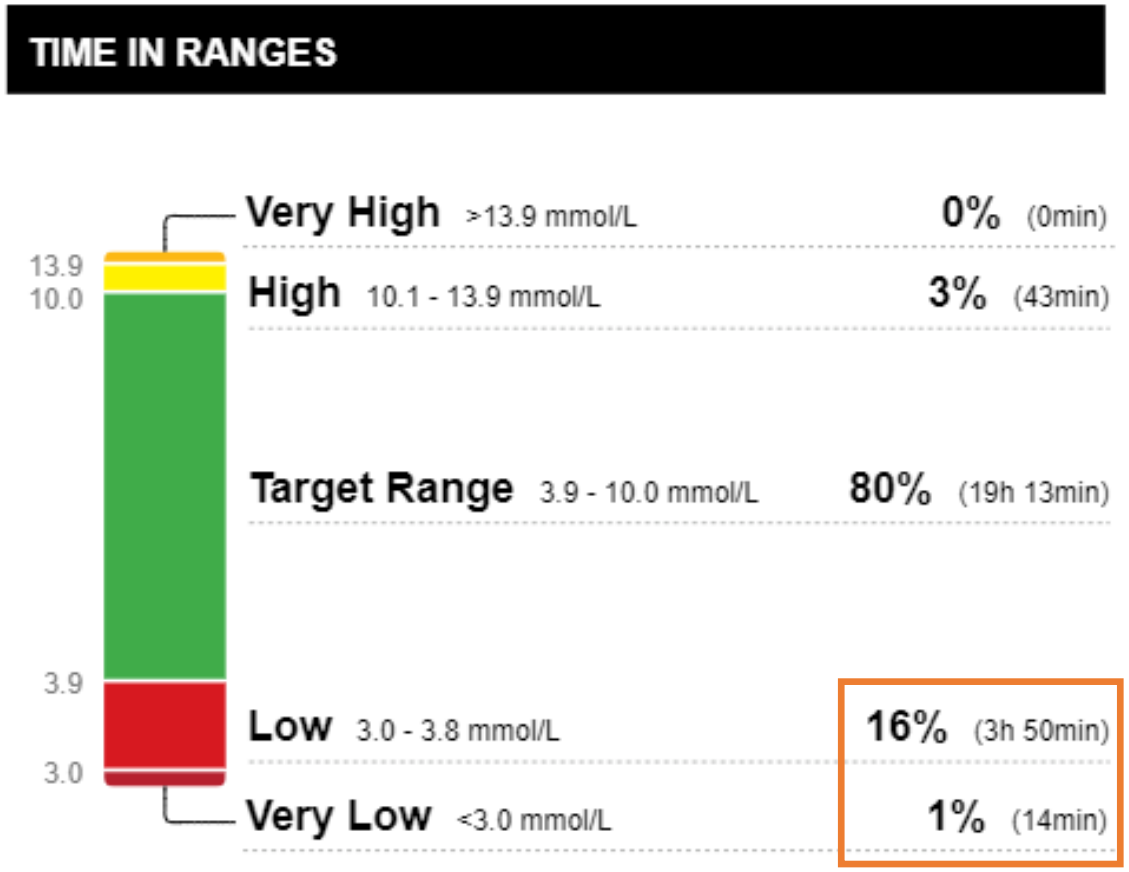
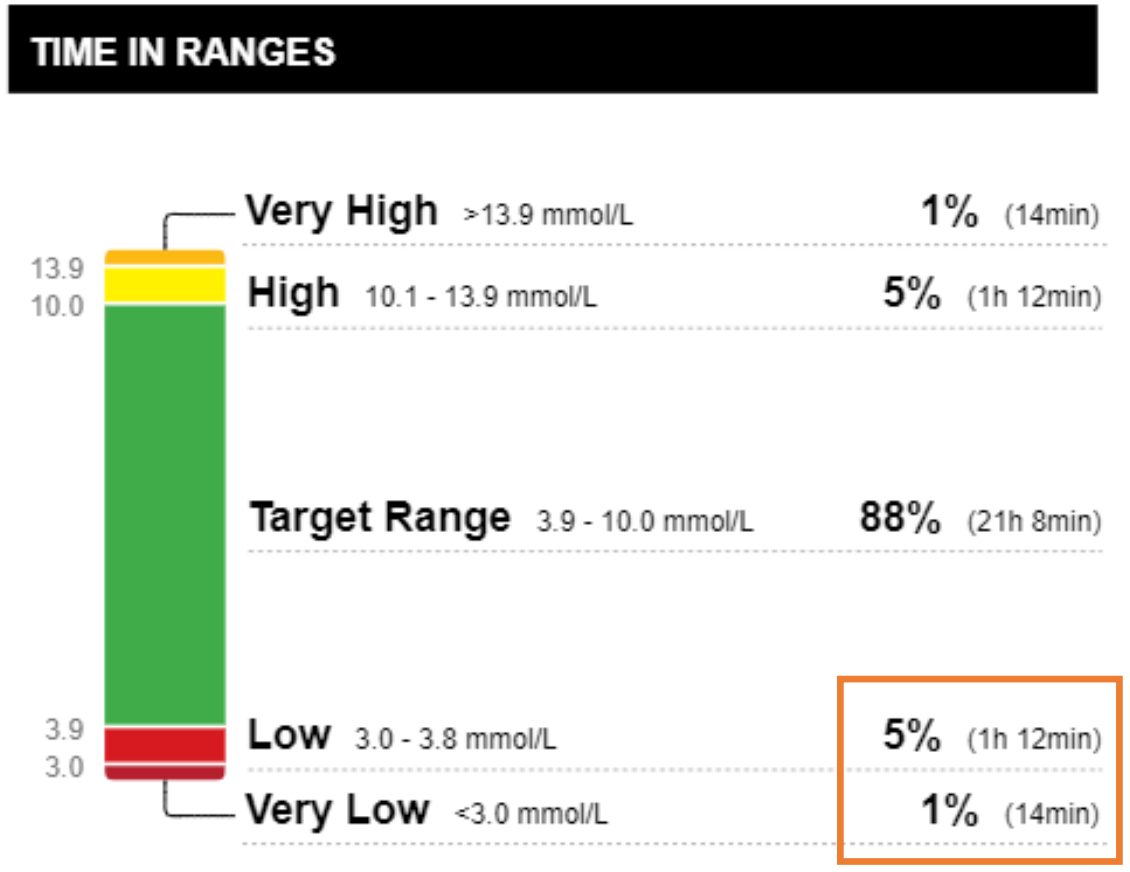
Time in Ranges in minutes or % of 24 hours

Run-in period



Intervention period



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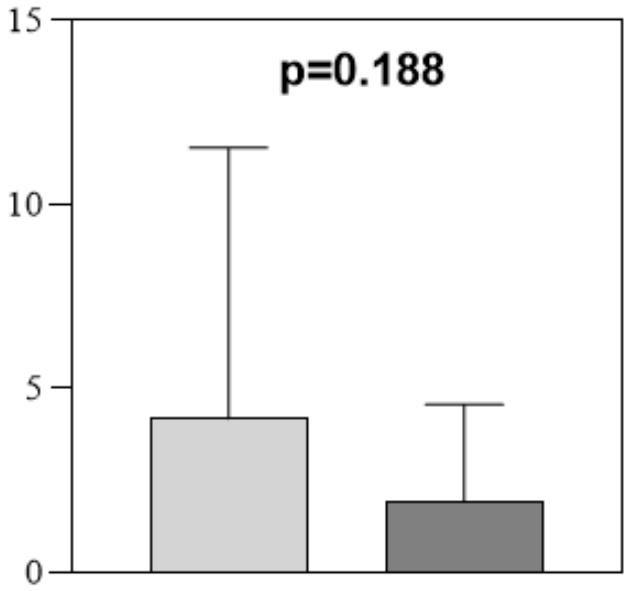
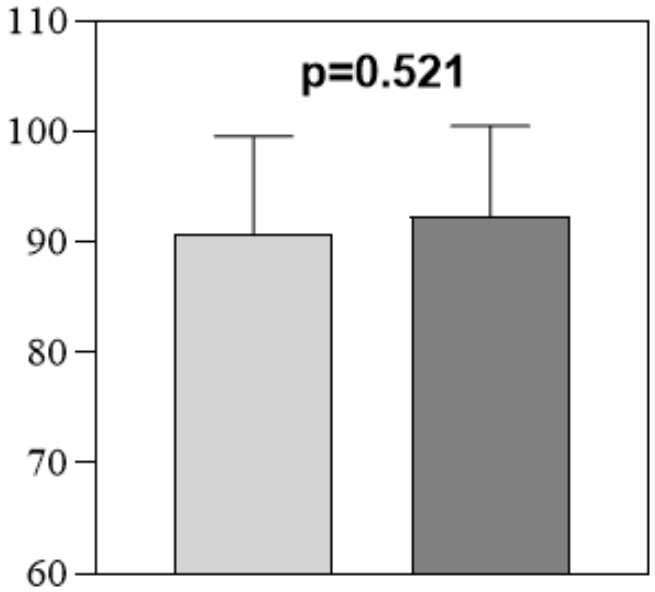
Mean changes from Run-in to Intervention period measured in % of 24 hours

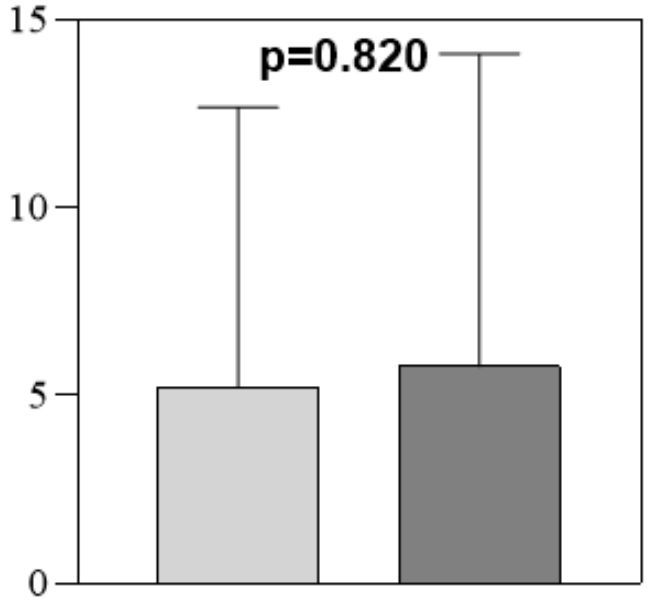
Time above range > 10.1mmol/L



Time in range 3.9-10.0 mmol/L



Time below range > 3.8 mmol/L



Run-in period
Intervention period

Results

	First visit/ Run-in period Mean (SD)	Third visit/ Intervention period Mean (SD)	P-value
Total GSRS	2.7 (0.8)	2.5 (0.6)	0.027
DSS of early dumping	9.6 (4.5)	7.0 (5.2)	0.025
Mean glucose level (CGM measured) mmol/L	5.9 (0.9)	5.6 (0.6)	0.16
Mean glucose level (Serum-glucose) mmol/L	5.0 (0.5)	5.0 (0.8)	0.88
HbA1c mmol/mol	35.8 (3.8)	36.1 (3.8)	0.50
C-peptide nmol/L	0.73 (0.3)		
Number of events with blood glucose <3.9mmol/L	12.2 (12.7)	10.4 (9.1)	0.29
Number of events with blood glucose <3.0mmol/L	1.4 (3.7)	1.6 (2.6)	0.47

Conclusion

- Reduction in PBH measured with CGM seems to reduce gastrointestinal and hypoglycemic symptoms measured with GSRS and DSS.
- CGM have the potential to be an educational tool for patients to see connections between food, glucose fluctuations, and abdominal pain.
- All patients experienced benefit of participating in the study even though only 11 patients had less hypoglycemic events.

Funding

Liaison Committee between the Central Norway Regional Health Authority (RHA), Norwegian University of Science and Technology (NTNU)

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