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The influence of timing of eating on weight loss in gastric bypass patients

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Circadian rhythms have an important regulatory role in appetite and body weight [(1)] which when disrupted may lead to weight gain[(2)]. Studies have suggested that food consumption at the end of the day is associated with lower weight loss after bariatric surgery [(3)]. However, the evidence to date is limited [(3)] and based on subjective measures of food intake. The aim of this research was to use objective measures of food intake to investigate if timing of energy intake (EI) was associated with weight loss in gastric bypass patients (GBP) up to 2 years after surgery, compared to weight-stable controls. GBP (n15, 46.5 ± 14.3y, BMI: 46.2 ± 6.7kg/m^2, 11F,4M) and weight-stable controls (n16, 44.2 ± 15.9y, 25.1 ± 3.9kg/m^2, 11F,5M) completed a two-night stay within the Human Intervention Studies Unit (Ulster University, Coleraine) on four occasions; pre-surgery (-1 month) and 3-, 12- and 24-months post-surgery. On each study occasion participants' EI (24-hour (MJ)) was covertly measured and timing of eating recorded using closed-circuit television over four epochs: 7:00–11:00am, 11:01- 3:00pm, 3:01–7:00pm and 7:01–11:00pm. Body composition was measured at each visit using dual energy X- ray absorptiometry. Differences between %EI within epochs at baseline and over time were investigated using a one way- and two way- ANOVA respectively, and associations with weight loss using Spearman's Rank correlations. At baseline GBP had a higher total EI than controls (21.9 ± 3.0MJ vs 14.6 ± 1.1MJ, $p = 0.045$), however there were no differences between groups in timing of EI ($p > 0.37$), with all participant's consuming the lowest % of their EI in epoch 1 (7:00–11:01am) (22.8 ± 7.3%) and epoch 4 (7:01–11pm) (28.5 ± 6.4%) (ANOVA $p < 0.001$). Over the four timepoints GBP reduced their EI by 10.1 ± 2.1, 6.8 ± 1.8 and 4.7 ± 1.3MJ at 3-, 12- and 24-months respectively after gastric bypass surgery, compared to the controls. However, no changes were observed in timing of eating ($p > 0.05$). Percentage EI within individual epochs at baseline did not predict % weight loss at 24-months in GBPs; although %EI in epoch 2 (11:01–3:00pm) at 3-months was positively associated with % weight loss at the same timepoint ($R^2 = 0.37$, $p = 0.016$). Our study found no differences in timing of eating between GBP and control participants, and this did not change after surgery. Unlike previous findings there were limited associations between timing of eating and weight loss. Further longer-term research using objective measures are required in a larger cohort to fully elucidate the role of timing of eating as a modifiable factor to support weight loss in GBP. Participants are currently involved in a 60-month follow- up appointment which will look at associations with weight regain.

References

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