

LONG-TERM CHANGES IN URINARY INCONTINENCE AMONG SEVERELY OBESE WOMEN FOLLOWING BARIATRIC SURGERY

Hypothesis / aims of study

Short-term improvements in urinary incontinence (UI) have been reported in obese patients in the first year following bariatric surgery, but evidence of the durability of this effect is lacking. Our aim was to provide new insight into longer-term effects of bariatric surgery on UI by examining changes in UI frequency over 3 years and identifying factors associated with persistent improvement and remission in UI among obese women after bariatric surgery.

Study design, materials and methods

Urinary incontinence was assessed among female participants in the Longitudinal Assessment of Bariatric Surgery-2 (LABS-2) study, a prospective cohort study of severely obese patients aged 18 years and older seeking a first-time bariatric surgical procedure. Participants were recruited between 2006 and 2009 from one of 6 clinical centers in the United States and asked to complete a validated patient-reported questionnaire that assessed frequency and clinical type of UI over a 3-month period prior to bariatric surgery as well as at annual follow-up assessments over 3 years. Among female participants reporting weekly prevalent UI (i.e., at least weekly UI episodes) at baseline, generalized linear mixed models were used to estimate change in frequency of UI episodes by clinical type (any, urgency, stress), as well as rates of remission (defined by less than weekly UI episodes at follow-up) and complete remission (a subset of remission, defined by no UI episodes at follow-up), with adjustment for multiple comparisons. Mixed-effects ordinal logistic regression and generalized linear mixed models were used to identify factors independently related to change in frequency and remission, respectively.

Results

Of the 1565 female LABS-2 participants who completed the urinary symptoms questionnaire prior to bariatric surgery and at one or more annual follow-up assessments, 772 (49%) had weekly prevalent UI at baseline. Median (IQR) age in this population was 46 (37-54) years and body mass index (BMI) was 45.5 (41.6-50.9) kg/m². On average, women reported 10.9 (95% CI: 9.8-12.1) UI episodes per week, with 30% reporting stress-only, 11% urgency-only, 57% mixed stress and urgency, and 2% other-type UI at baseline. Most underwent Roux-en-Y gastric bypass (70%) or adjustable gastric banding (25%). Median (IQR) percent weight loss was substantial and maintained through 3 years: 31.4 (22.4-37.8)% at 1 year, 31.4 (22.4-39.1)% at 2 years and 28.9 (20.4-37.2)% at 3 years. Compared to baseline, frequency of UI episodes was significantly lower at all post-surgery follow-up time points, although the frequency of UI increased after year 1 (Figure 1). Similarly, the rate of UI remission was higher at year 1 than at years 2 and 3, but still 59% at year 3 (Table 1). Weight change from 1 to 2 years was associated with UI relapse at 2 years, with each 5-kg increase in weight increasing the risk of relapse in women at 2 years by 29% (RR: 1.29; 95% CI: 1.13-1.49).

Variables independently associated with reduced UI frequency and with UI remission ($p < 0.05$) overall were younger age (OR 1.32 and 1.08 per 10 years younger, respectively), greater weight loss (1.28 and 1.08 per 5% loss, respectively), and not having a severe walking limitation. Pregnancy in the past year (OR 0.24), presence of either stress or urgency incontinence (vs. both) at baseline (OR 2.24 and 1.81, respectively), and undergoing roux-en-Y gastric bypass (vs. laparoscopic adjustable gastric band (OR 1.63) were also associated with improvement. Race, ethnicity, parity, prior hysterectomy, current smoking status, history of heart disease, and pre-/post-surgery asthma, hypertension, depressive symptoms, and hormone replacement therapy were not independently related to either outcome.

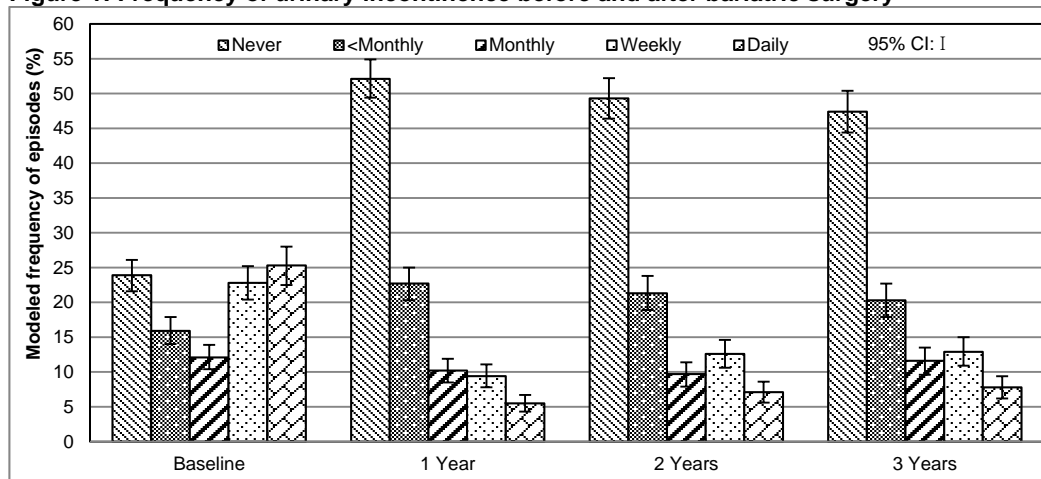
Interpretation of results

In this large, prospective, multicenter cohort study of obese women undergoing bariatric surgery, frequency of UI decreased substantially during the three years after surgery, with the majority of women reporting remission and one in four reporting complete remission. Compared to the first post-operative year, rates of remission decreased in the second and third post-operative years, and weight gain over the second post-operative year was associated with increased risk of UI relapse.

Concluding message

Long-term improvement in UI appears to be an important benefit of bariatric surgery in severely obese women, but maintenance of weight loss may be important to maintaining improvements in UI in this population.

Figure 1: Frequency of urinary incontinence before and after bariatric surgery



Years 1, 2, 3 vs Baseline^a: $P < .001$ Year 2 vs Year 1: $P = 0.01$ Year 3 vs Year 2 $P = 0.51$

Table 1. Modeled percent (95% CI) of women with baseline weekly urinary incontinence (N=772) who achieved remission and complete remission after surgery

	Years since bariatric surgery			Adjusted <i>P</i> value	
	1 year	2 years	3 years	Year 2 vs year 1	Year 3 vs year 2
Remission*	67.0 (63.7-70.6)	59.9 (56.3-63.7)	59.3 (55.6-63.2)	<.001	.93
Complete remission**	28.9 (25.7-32.4)	26.8 (23.6-30.4)	27.4 (24.2-31.2)	.44	.92

* Remission was defined as less than weekly UI episodes over the past 3 months at specified follow-up.

** Complete remission was defined as no UI episodes over the past 3 months at specified follow-up.

Disclosures

Funding: This research was funded by US National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) grants U01 DK066557, U01-DK66667, U01-DK66568, U01-DK66471, U01-DK66526, U01-DK66585, and U01-DK66555. **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Institutional review boards of all participating clinical centers in the LABS-2 consortium, including University of Pittsburgh, Weill Cornell Medical College, University of Washington, East Carolina University, University of North Dakota, and Oregon Health and Science University. **Helsinki:** Yes **Informed Consent:** Yes