

FAT MALABSORPTION CONTRIBUTION TO HYPEROXALURIA AFTER ROUX-EN-Y GASTRIC BYPASS IN RATS

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INTRODUCTION

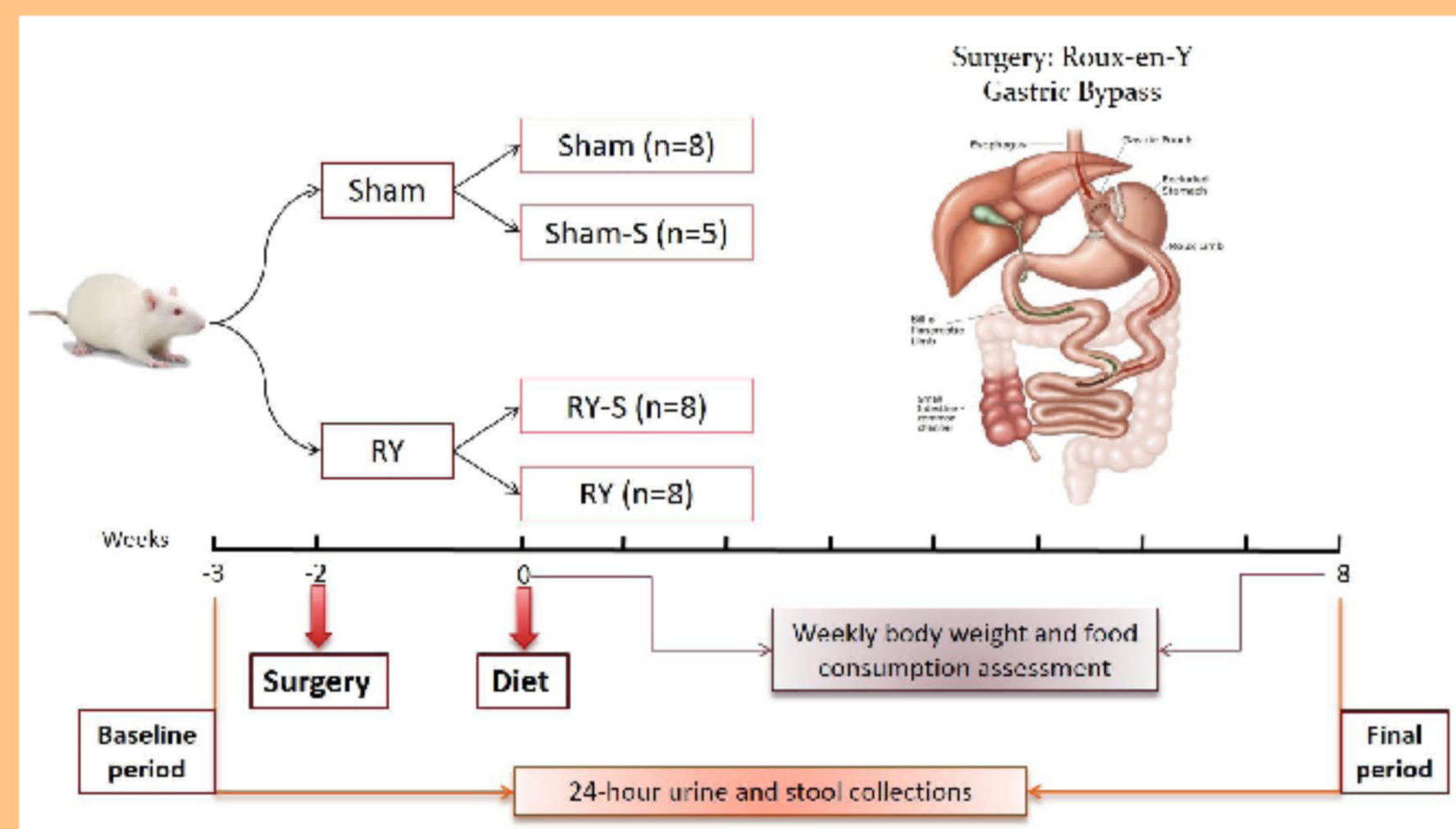
- Hyperoxaluria and a higher risk of nephrolithiasis are a common complication of bariatric surgery
- We have previously shown that increased intestinal absorption of dietary oxalate is a predisposing mechanism for enteric hyperoxaluria among Roux-en-Y (RY) gastric bypass patients (*Clin J Am Soc Nephrol* 7(12):2033, 2012).
- However, it remains controversial whether or not fat intestinal malabsorption may contribute to hyperoxaluria after RY surgery.

AIM

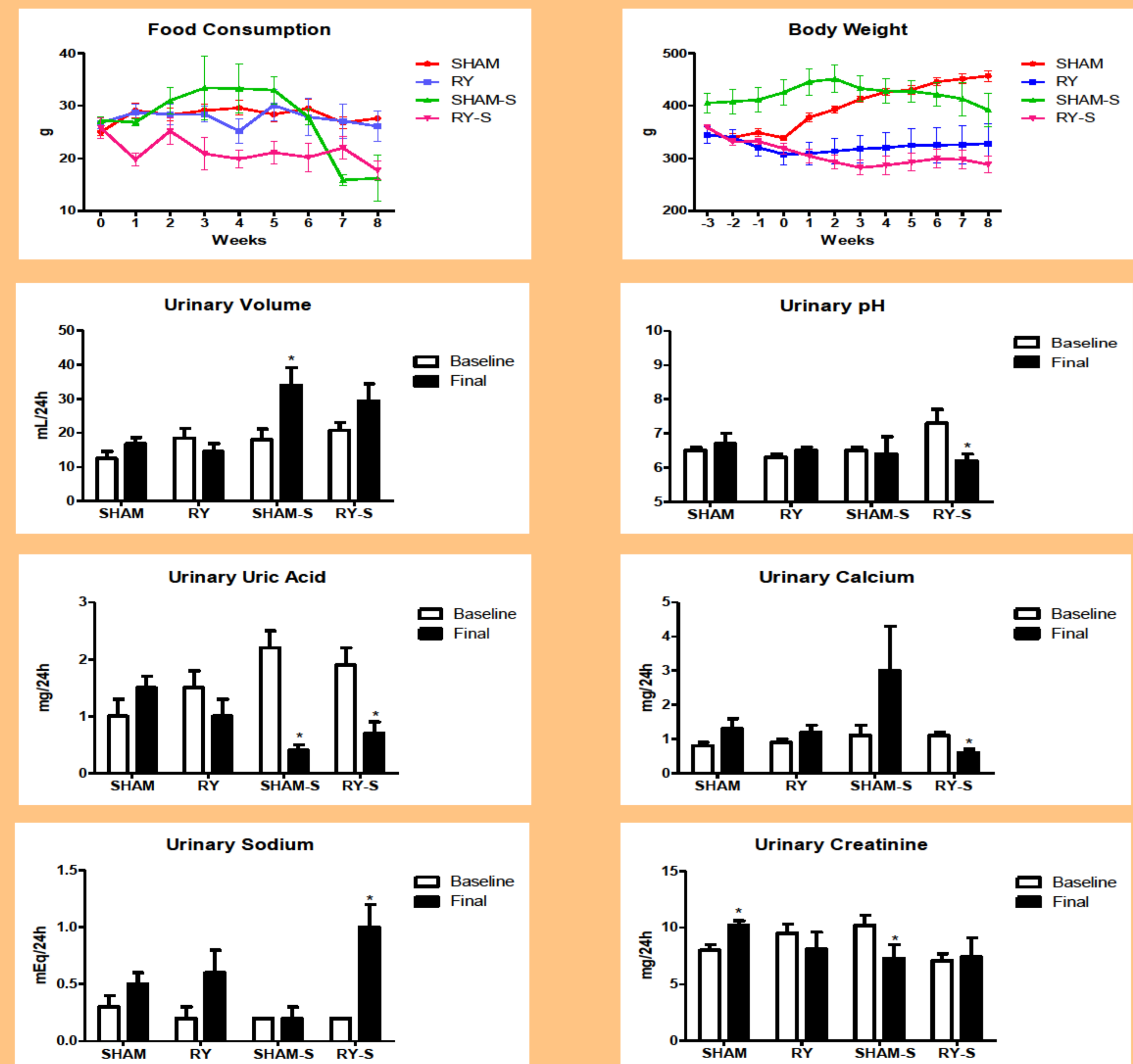
- To investigate the presence of steatorrhea and its relation with urinary oxalate and other parameters in a RY gastric bypass model in rats.

METHODS

- Twenty-nine (29) male Wistar rats underwent RY or Sham surgeries.
- Two weeks after surgery, the animals were fed with either a supplemented diet with high oxalate (1% sodium oxalate) + fat (18% lipids) (RY-S and Sham-S groups) or a regular chow (RY and Sham) during 8 weeks.
- 24h urine collections and stool samples were obtained 1 week before the surgery (baseline) and at the end of the study (final) to determine volume, pH, creatinine, uric acid, magnesium, sodium, calcium and oxalate
- Body weight and food consumption were weekly assessed.
- Fecal fat was quantified by steatocrit technique at baseline and at the final period.

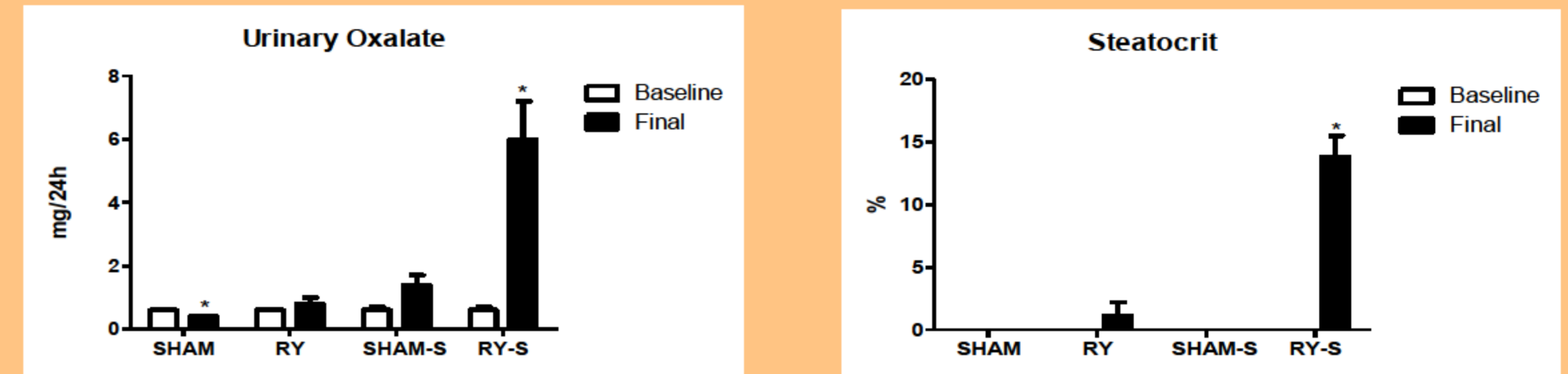


RESULTS



p<0.05 * vs baseline

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p<0.05 * vs baseline

		SHAM	RY	SHAM-S	RY-S
Urinary Volume (mL/24h)	baseline	12.5±6.0	18.5±7.8	18.0±7.2	20.8±6.6
	final	16.8±5.4	14.5±6.9	34.0±11.3 ^c	29.4±14.2 ^b
Urinary pH	baseline	6.5±0.3	6.3±0.2 ^c	6.5±0.1	7.3±1.1 ^{a,b}
	final	6.7±0.9	6.5±0.4	6.4±1.2	6.2±0.5
Urinary creatinine (mg/24h)	baseline	8.0±1.3	9.5±2.2	10.2±2.0	7.1±1.7 ^a
	final	10.2±1.2	8.1±4.3	7.3±2.6	7.4±4.8
Urinary uric acid (mg/24h)	baseline	1.0±0.7	1.5±1.0	2.2±0.6	1.9±1.0
	final	1.5±0.5	1.0±0.8	0.4±0.2 ^c	0.7±0.6
Urinary magnesium (mg/24h)	baseline	2.4±0.6	3.0±0.9	3.4±1.9	3.2±0.6
	final	2.8±1.6	3.2±1.1	4.7±2.1	2.8±0.9
Urinary sodium (mEq/24h)	baseline	0.3±0.3	0.2±0.2	0.2±0.1	0.2±0.1
	final	0.5±0.2	0.6±0.4	0.2±0.2	1.0±0.6 ^a
Urinary calcium (mg/24h)	baseline	0.8±0.2	0.9±0.3	1.1±0.6	1.1±0.3
	final	1.3±0.8	1.2±0.5	3.0±2.9	0.6±0.2 ^a
Urinary oxalate (mg/24h)	baseline	0.6±0.1	0.6±0.1	0.6±0.2	0.6±0.2
	final	0.4±0.1	0.8±0.6	1.4±0.7	6.0±3.3 ^{a,b}
Steatocrit (%)	baseline	0.0±0.0	0.0±0.0	0.0±0.0	0.0±0.0
	final	0.0±0.0	1.1±2.9	0.0±0.0	13.8±4.9 ^{a,b}

p<0.05 ^a vs Sham-S; ^b vs RY; ^c vs Sham

SUMMARY

Comparison between periods (final vs baseline)

- In Sham group, urinary creatinine was significantly higher and oxalate significantly lower.
- In RY group, no significant differences were observed.
- In Sham-S group, urinary volume was significantly higher and uric acid and creatinine significantly lower.
- In RY-S group, significant decreases in urinary pH, uric acid, calcium and significant increases in urinary sodium, oxalate and steatocrit were observed.

Comparison between groups

Baseline

- In RY group, the urinary pH was significantly lower vs Sham.
- In RY-S group, the urinary pH was significantly higher vs RY and Sham-S and urinary creatinine significantly lower vs Sham-S.

Final

- In Sham-S group, the urinary volume was significantly higher and uric acid significantly lower vs Sham.
- In RY-S group, urinary volume and sodium were significantly higher vs RY and Sham-S and urinary calcium significantly lower vs Sham-S. A marked and significant increase in urinary oxalate and in the steatocrit was observed vs RY and Sham.

CONCLUSION

- We concluded that a high fat and oxalate rich diet in this RY model, induced a significant and marked increase in urinary oxalate and fecal fat suggesting that under these dietary conditions, fat malabsorption leads to hyperoxaluria after RY gastric bypass.

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