Improvement of hypothyroidism after bariatric surgery

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Introduction

Thyroid hormone plays a vital role in the management of energy expenditure and body mass index (BMI).

Hypothyroidism is associated with a decreased metabolic rate and increased prevalence of obesity.

Aim

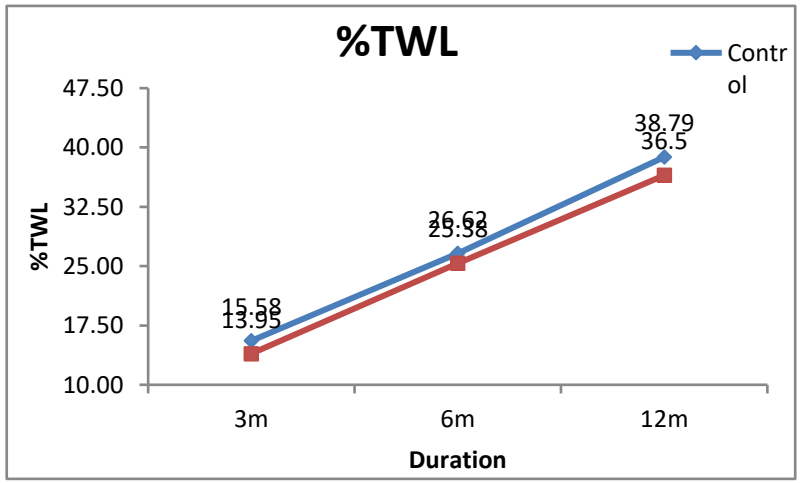
- To analyse the improvement of thyroid functions post bariatric surgery.
- To find out the differences in weight loss between euthyroid and hypothyroid post bariatric.
- To understand the Thyroid replacement therapy (TRT) dosage alteration post surgery.

Method

- Retrospective study from tertiary care centre in India.
- 1 year data of post bariatric patients (February 2019 to January 2021) were collected from institutional database.
- Data analysis done using SPSS.

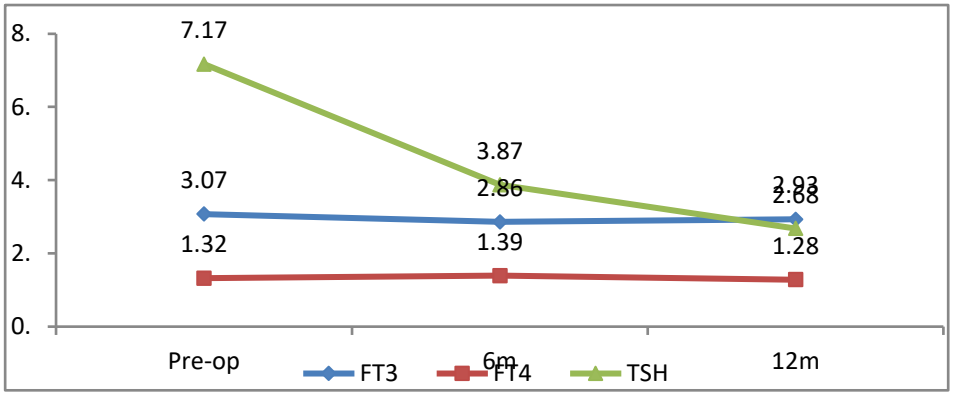
Results

- Total population – 240
  - Euthyroid (control) – 122
  - Hypothyroid (test) – 118
- Males - 69(28.6%)
- Female - 171(71.4%)

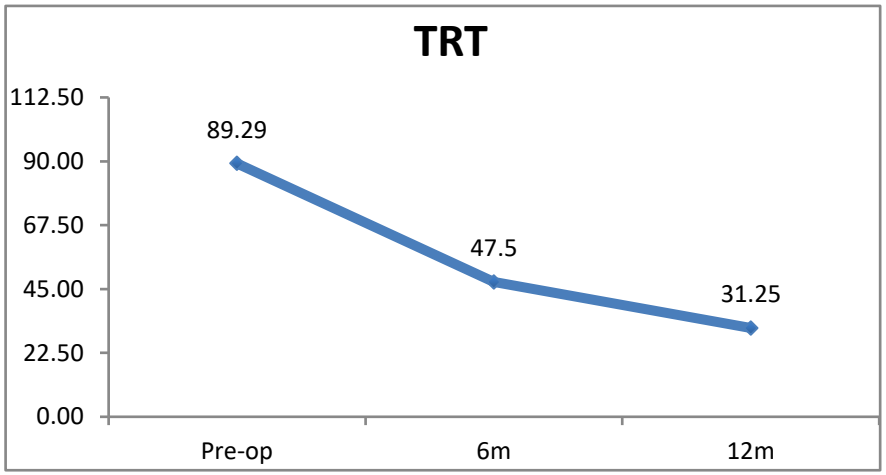


	Control	Test
Mean pre op BMI	46.32±8.26 kg/m2	45.08±9.70 kg/m2
%Excess BMI loss (EBMIL)	79.66±14.12 kg/m2	80.43±12.59 kg/m2

Results- Test group



- Serum TSH levels
  - 6th month (3.87±2.97; p=0.050)
  - 1 year (2.68±1.65; p=0.019)



- Significant reduction of (TRT) dosage
  - 6th months (p=0.002)
  - 1 year (p< 0.001)

Discussion

- Significant weight-loss and thyroid profile improvement (a), (b)
- Significant weight loss and thyroid dosage improvement (c)
- No weight reduction variation between hypothyroid and euthyroid patient (d)

(a) Neves JS, Castro Oliveira S, Souteiro P, Pedro J, Magalhães D, Guerreiro V, et al. Effect of Weight Loss after Bariatric Surgery on Thyroid-Stimulating Hormone Levels in Patients with Morbid Obesity and Normal Thyroid Function. Obes Surg. 2018 Jan 1;28(1):97–103.

(b) Moulin De Moraes CM, Mancini MC, De Melo ME, Figueiredo DA, Villares SMF, Rascovski A, et al. prevalence of subclinical hypothyroidism in a morbidly obese population and improvement after weight loss induced by Roux-en-Y gastric bypass. Obes Surg. 2005 Oct;15(9):1287–91.

(c) Flier JS, Harris M, Hollenberg AN. Leptin, nutrition, and the thyroid: The why, the wherefore, and the wiring. Vol. 105, Journal of Clinical Investigation. The American Society for Clinical Investigation; 2000. p. 859–61.

(d) Neves JS, Castro Oliveira S, Souteiro P, Pedro J, Magalhães D, Guerreiro V, et al. Effect of Weight Loss after Bariatric Surgery on Thyroid-Stimulating Hormone Levels in Patients with Morbid Obesity and Normal Thyroid Function. Obes Surg. 2018 Jan 1;28(1):97–103.

Review > Surg Obes Relat Dis. 2021 Jun;17(6):1206-1217. doi: 10.1016/j.soard.2021.02.028. Epub 2021 Mar 6.

Hypothyroidism and levothyroxine therapy following bariatric surgery: a systematic review, meta-analysis, network meta-analysis, and meta-regression

Carmil Azran [1], Nirvana Hanhan-Shamshoum [2], Tujan Irshied [2], Tomer Ben-Shushan [2], Dror Dicker [3], Arik Dahan [4], Ilan Matok [5]

Results: A total of 28 studies involving 1284 patients were included. There was a statistically significant decrease in TSH levels after bariatric surgery (mean difference = -1.66 mU/L, 95%CI [-2.29, -1.03], P < .0001). In meta-regression analysis, we found that the following moderator variables: length of follow-up, mean age, baseline TSH, and preoperative thyroid function, could explain 1%, 43%, 68%, and 88% of the between-study variance, respectively. Furthermore, subclinical hypothyroidism was completely resolved in 87% of patients following bariatric surgery. In addition, there was a statistically significant decrease of levothyroxine dose in frank hypothyroid patients following bariatric surgery (mean difference = -13.20 mcg/d, 95%CI [-19.69, -6.71]). In network meta-analysis, we found that discontinuing or decreasing levothyroxine dose was significant following Roux-en-Y gastric bypass, 1 anastomosis gastric bypass, and sleeve gastrectomy, (OR = 31.02, 95%CI [10.34, 93.08]), (OR = 41.73, 95%CI [2.04, 854.69]), (OR = 104.03, 95%CI [35.79, 302.38]), respectively.

J Clin Med. 2020 Jan 28;9(2):359. doi: 10.3390/jcm9020359.

Central Resistance to Thyroid Hormones in Morbidly Obese Subjects Is Reversed after Bariatric Surgery-Induced Weight Loss

Paula Juiz-Valiña [1 2 3], María Cordido [1 2 3], Elena Outeiriño-Blanco [4], Sonia Pértega [5], Bárbara María Varela-Rodríguez [1 2 3], María Jesús García-Brao [6], Enrique Mena [6], Lara Pena-Bello [1 2], Susana Sangiao-Alvarellos [1 2 3], Fernando Cordido [1 2 3 4]

Endocrine abnormalities are common in obesity, including altered thyroid function. The altered thyroid function of obesity may be due to a mild acquired resistance to the thyroid hormone. The aim of this study was to investigate the effect of weight loss after bariatric surgery (BS) on resistance to thyroid hormones in patients with extreme obesity compared with a control group. We performed an observational study evaluating patients with extreme obesity who underwent BS. We included 106 patients (83 women) and 38 controls (24 women). The primary endpoint was the thyrotroph thyroxine resistance index (TT4RI) and thyroid stimulating hormone (TSH) index (TSHRI). The parameters were studied before and after surgery. TSHRI and TT4RI were higher in the obese patients than in the control group. TT4RI and TSHI decreased significantly over time after surgery, with this decrease being associated with the excessive body mass index (BMI) loss and C-reactive protein (CRP). In extreme obesity, BS promotes a significant decrease in the increased TT4RI and TSHI. This decrease of TT4RI and TSHI is progressive over time after BS and significantly associated with excess BMI lost and CRP. Extreme obesity is characterized by a mild reversible central resistance to thyroid hormones.

Conclusion

- Bariatric surgery can improve the thyroid function.
- Improvement in thyroid function vs improvement in TSH resistance ??
- There was no correlation found between weight reduction and dosage improvement post bariatric surgery.
- However , there's a definitive reduction in the dosage of thyroxine post BS