Endocrinol Diabetes Nutr. 2020;67(5):351–352

Endocrinología, Diabetes y Nutrición

www.elsevier.es/endo

SCIENTIFIC LETTER

Weight loss induced by bariatric surgery and seminal quality☆

Pérdida de peso mediante cirugía bariátrica y calidad seminal

The global obesity epidemic affects more than 400 million adults worldwide,[1] with adverse effects for health, including sexual and reproductive function. Bariatric surgery is one of the most effective methods for achieving weight loss in obese individuals, and approximately half a million bariatric surgeries are performed every year throughout the world for this purpose.[2] Anthropometric and metabolic parameters are usually assessed following surgical procedures, but little is known about the relationship between bariatric surgery and fertility. Recently, Dr. Claire Carette et al. published the results of BARIASPERM,[3] the first prospective controlled study conducted in 5 university hospitals in France, evaluating the effect of bariatric surgery upon seminal quality in men with no history of fertility problems.

The study recorded metabolic, inflammatory and semen parameters in 46 males with a body mass index (BMI) of $44.1 \pm 5.5\,kg/m^2$ at the start of the study: 20 subjected to gastric bypass surgery and 26 to gastric sleeve surgery. As expected, the BMI decreased to $32.2 \pm 5.4\,kg/m^2$ at 6 months and to $31.4 \pm 5.3\,kg/m$ at 12 months after surgery. Surgery induced an increase in testosterone and sex hormone binding globulin, while inflammatory and immunological parameters such as insulin, the homeostatic model for assessing insulin resistance, and leptin decreased. With regard to the semen parameters, total sperm concentration, typical sperm forms, and DNA fragmentation decreased. By contrast, sperm volume, motility and viability showed no changes.

Although at the start of the study 8 of the 46 men showed low sperm counts (less than 15 million sperm per ml), only four remained below this figure at 6 months, and at 12 months the sperm count only remained altered in three subjects. However, paradoxically, after surgery, 6 subjects (at 6 months) and 7 subjects (at 12 months) with initially normal counts presented oligozoospermia. Based on the above findings, the authors suggest that males who consult for bariatric surgery to lose weight should be systematically informed about the possibility and importance of semen cryopreservation before surgery, with the purpose of storing frozen sperm for later use during assisted reproduction procedures if they wish to have offspring.

It should be stressed that although bariatric surgery was able to reduce almost all male hypogonadism associated with obesity after one year (45 out of 46 cases) in the series published by Carette et al.,[3] it is not known whether azoospermia is associated with hormone changes or the negative impact of a new diet and the intake of vitamins and minerals required during gametogenesis.[4]

A systematic review and meta-analysis[5] prior to the publication of the prospective BARIASPERM study concluded that bariatric surgery offers no benefits with regard to semen parameters. However, some studies have shown a positive effect on sperm epigenetics[6] and have even found weight loss to be associated with better semen parameters.[7,8] This is probably attributable to less dramatic and more controlled weight loss than in the case of bariatric surgery.

Male obesity is a modifiable risk factor in relation to successful pregnancy, and in order to correct this parameter, males undergo procedures such as bariatric surgery without taking into account the potential adverse effects involved. Therefore, it is very important to inform men who wish to undergo bariatric surgery that according to the best available evidence, such surgery will not necessarily result in improved quality of male sexual and reproductive health - in contrast to the data obtained in females - and that it may even have some adverse effects.

References

1. Nguyen DM, El-Serag HB. The epidemiology of obesity. Gastroenterol Clin North Am. 2010;39:1–7.
2. Angrisani L, Santonicola A, Iovino P, Vitiello A, Zundel N, Buchwald H, et al. Bariatric surgery and endoluminal procedures: IFSO Worldwide Survey 2014. Obes Surg. 2017;27:2279–89.
3. Carette C, Levy R, Eustache F, Baron G, Coupaye M, Msika S, et al. Changes in total sperm count after gastric bypass and sleeve gastrectomy: the BARIASPERM prospective study. Surg Obes Relat Dis. 2019;15:1271–9.
4. Nassan FL, Chavarro JE, Tanrikut C. Diet and men's fertility: does diet affect sperm quality? Fertil Steril. 2018;110:570–7.

☆ Please cite this article as: Cardona Maya WD. Pérdida de peso mediante cirugía bariátrica y calidad seminal. Endocrinol Diabetes Nutr. 2020;67:351–352.

https://doi.org/10.1016/j.endien.2019.10.005

5. Lee Y, Dang JT, Switzer N, Yu J, Tian C, Birch DW, et al. Impact of bariatric surgery on male sex hormones and sperm quality: a systematic review and meta-analysis. Obes Surg. 2019;29:334–46.
6. Donkin I, Versteyhe S, Ingerslev LR, Qian K, Mechta M, Nordkap L, et al. Obesity and bariatric surgery drive epigenetic variation of spermatozoa in humans. Cell Metab. 2016;23:369–78.
7. Hakonsen LB, Thulstrup AM, Aggerholm AS, Olsen J, Bonde JP, Andersen CY, et al. Does weight loss improve semen quality and reproductive hormones? Results from a cohort of severely obese men. Reprod Health. 2011;8:24.
8. Puerta-Suárez J, Gómez-Gutiérrez A, Cardona-Maya W. Efecto de la disminución del índice de masa corporal sobre la calidad seminal. Rev Cubana Obstet Ginecol. 2019;45.

Walter D. Cardona Maya

Grupo Reproducción, Universidad de Antioquia, Medellín, Colombia
E-mail address: wdcmaya@medicina.udea.edu.co