

# IVF outcomes in patients with a history of bariatric surgery: a multicenter retrospective cohort study

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**STUDY QUESTION:** How does a history of dramatic weight loss linked to bariatric surgery impact IVF outcomes?

**SUMMARY ANSWER:** Women with a history of bariatric surgery who had undergone IVF had a comparable cumulative live birth rate (CLBR) to non-operated patients of the same BMI after the first IVF cycle.

**WHAT IS KNOWN ALREADY:** In the current context of increasing prevalence of obesity in women of reproductive age, weight loss induced by bariatric surgery has been shown to improve spontaneous fertility in obese women. However, little is known on the clinical benefit of bariatric surgery in obese infertile women undergoing IVF.

**STUDY DESIGN, SIZE, DURATION:** This exploratory retrospective multicenter cohort study was conducted in 10 287 IVF/ICSI cycles performed between 2012 and 2016. We compared the outcome of the first IVF cycle in women with a history of bariatric surgery to two age-matched groups composed of non-operated women matched on the post-operative BMI of cases, and non-operated severely obese women.

**PARTICIPANTS/MATERIALS, SETTING, METHODS:** The three exposure groups of age-matched women undergoing their first IVF cycle were compared: Group 1: 83 women with a history of bariatric surgery (exposure, mean BMI 28.9 kg/m<sup>2</sup>); Group 2: 166 non-operated women (non-exposed to bariatric surgery, mean BMI = 28.8 kg/m<sup>2</sup>) with a similar BMI to Group 1 at the time of IVF treatment; and Group 3: 83 non-operated severely obese women (non-exposed to bariatric surgery, mean BMI = 37.7 kg/m<sup>2</sup>). The main outcome measure was the CLBR. Secondary outcomes were the number of mature oocytes retrieved and embryos obtained, implantation and miscarriage rates, live birth rate per transfer as well as birthweight.

**MAIN RESULTS AND THE ROLE OF CHANCE:** No significant difference in CLBR between the operated Group 1 patients and the two non-operated Groups 2 and 3 was observed (22.9%, 25.9%, and 12.0%, in Groups 1, 2 and 3, respectively). No significant difference in average number of mature oocytes and embryos obtained was observed among the three groups. The implantation rates were not different between Groups 1 and 2 (13.8% versus 13.7%), and although lower (6.9%) in obese women of Group 3, this difference was not statistically significant. Miscarriage rates in Groups 1, 2 and 3 were 38.7%, 35.8% and 56.5%, respectively ( $P = 0.256$ ). Live birth rate per transfer in obese patients was significantly lower compared to the other two groups (20%, 18%, 9.3%, respectively, in Groups 1, 2 and 3,  $P = 0.0167$ ). Multivariate analysis revealed that a 1-unit lower BMI increased the chances of live birth by 9%. In operated women, a significantly smaller weight for gestational age was observed in newborns of Group 1 compared to Group 3 ( $P = 0.04$ ).

**LIMITATIONS, REASONS FOR CAUTION:** This study was conducted in France and nearly all patients were Caucasian, questioning the generalizability of the results in other countries and ethnicities. Moreover, 950 women per group would be needed to achieve