

# The influence of female and male body mass index on live births after assisted reproductive technology treatment: a nationwide register-based cohort study

Gitte Lindved Petersen, M.Sc. (Public Health),<sup>a</sup> Lone Schmidt, D.M.Sci.,<sup>a</sup> Anja Pinborg, D.M.Sci.,<sup>b</sup> and Mads Kamper-Jørgensen, Ph.D.<sup>a</sup>

<sup>a</sup> Section of Social Medicine, Department of Public Health, and <sup>b</sup> Fertility Clinic, Juliane Marie Center, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark

**Objective:** To investigate the independent and combined associations between female and male body mass index (BMI) on the probability of achieving a live birth after treatments with in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI) under adjustment for relevant covariates.

**Design:** Population-based cohort study.

**Setting:** Danish national registers.

**Patient(s):** Patients with permanent residence in Denmark receiving IVF or ICSI treatment with use of autologous oocytes from January 1, 2006, to September 30, 2010.

**Intervention(s):** None.

**Main Outcome Measure(s):** Live birth. Analyses were adjusted for age and smoking at treatment initiation and results stratified by BMI groups and presented by IVF/ICSI treatment.

**Result(s):** In total, 12,566 women and their partners went through 25,191 IVF/ICSI cycles with 23.7% ending in a live birth. Overweight and obese women with regular ovulation had reduced odds of live birth (adjusted OR 0.88, 95% CI 0.79–0.99 and adjusted OR 0.75, 95% CI 0.63–0.90, respectively) compared with normal-weight women. IVF-treated couples with both partners having BMI  $\geq 25$  kg/m<sup>2</sup> had the lowest odds of live birth (adjusted OR 0.73, 95% CI 0.48–1.11) compared with couples with BMI  $< 25$  kg/m<sup>2</sup>. BMI showed no significant effect on chance of live birth after ICSI.

**Conclusion(s):** Increased female and male BMI, both independently and combined, negatively influenced live birth after IVF treatments. With ICSI, the association with BMI was less clear. (Fertil Steril® 2013;99:1654–62. ©2013 by American Society for Reproductive Medicine.)

**Key Words:** Body mass index, in vitro fertilization, intracytoplasmic sperm injection, live birth, multilevel analysis

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The prevalence of obesity is increasing and constitutes a major worldwide epidemic affecting more than one billion people worldwide (1, 2). In Denmark, the proportion of

overweight and obese individuals constituted 32.5%–39.8% among women and 46.2%–57.6% among men aged 25–44 years in 2010. The prevalence tends to increase during

reproductive age in both sexes (3). Overweight and obesity is known to be associated with a number of comorbidities, such as type 2 diabetes, hypertension, certain cancers, and stroke (4). Over the past decades, attention has been directed toward the effect of obesity on fertility.

In women, adipose tissue affects the gonad hormonal balance, leading to increased levels of leptin and decreased levels of adiponectin, which is negatively associated with plasma

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Reprint requests: Gitte Lindved Petersen, M.Sc. (Public Health), Section of Social Medicine, University of Copenhagen, Øster Farimagsgade 5, DK-1014 Copenhagen K, Denmark (E-mail: [gilp@sund.ku.dk](mailto:gilp@sund.ku.dk)).

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