Göteborg, 2021

Obesity, weight reduction treatment and IVF

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i Hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, den 17 november, klockan 9:00

av Snorri Einarsson

Fakultetsopponent:
Professor Torsten Olbers
Linköpings Universitet

Avhandlingen baseras på följande delarbeten

I. Einarsson,S, Bergh,C, Friberg,B, Pinborg,A, Klajnbard,A, Karlström,P-O, Kluge,L, Larsson,I, Loft,A, Mikkelsen-Englund,A-L, Stenlöf,K, Wistrand,A, Thurin-Kjellberg,A. Weight reduction intervention for obese infertile women prior to IVF: a randomized controlled trial. Human Reproduction 2017; 32(8): 1621–1630.

II. Einarsson,S, Bergh,C, Kluge,L, Thurin-Kjellberg,A. No effect of weight intervention on perinatal outcomes in obese women scheduled for in vitro fertilization treatment. Acta Obstetricia et Gynecologica Scandinavica 2019; 98: 708–714.

III. Svenson,H, Einarsson,S, Olausson,D, Kluge,L, Bergh,C, Edén,S, Lönn,M, Thurin-Kjellberg,A. Inflammatory and metabolic markers in relation to outcome of In Vitro Fertilization in a cohort of predominantly overweight and obese women. Submitted.

SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER

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Obesity, weight reduction treatment and IVF

Snorri Einarsson

Avdelningen för obstetrik och gynekologi, Institutionen för kliniska vetenskaper, Sahlgrenska akademin, Göteborgs universitet, Sverige, 2021.

Abstract

Background: Obesity is a growing problem on a global scale and women with obesity have a higher risk for infertility and complications, for both mother and child, in pregnancy and birth. This has been shown both regarding spontaneous pregnancy and in vitro fertilization (IVF). Due to this, being obese may exclude women from publicly funded fertility treatments in the Nordic countries. Weight loss has been shown to affect fertility positively in obese women with anovulation but the effect in women scheduled for IVF is not clear.

Aims: To study the effect of a weight reduction intervention on reproductive, obstetric, neonatal, and metabolic outcomes in women with infertility and obesity who were scheduled for IVF treatment.

Methods: *Paper I*: 305 women with World Health Organization (WHO) grade I obesity and an indication for IVF were randomized to weight reduction with a very low-calorie diet (VLCD) followed by IVF (n=152) or IVF-only (n=153). The primary endpoint was live birth. *Paper II:* The births from Paper I were analyzed for perinatal and maternal outcomes. Primary endpoints were birthweight and deviation from expected birthweight. *Paper III:* 195 women from Paper I having serum samples fulfilling standardized criteria were analyzed as one cohort. Correlation between metabolic and anthropological factors to pregnancy and live birth after IVF was calculated. Metabolic changes of the weight reduction treatment were analyzed.

Results: *Paper I:* The weight-reduction-and-IVF group achieved a significantly higher weight loss compared to the IVF-only group. There was no significant difference in live birth between the groups but there were significantly more live births achieved through spontaneous pregnancies in the weight-reduction-and-IVF group. *Paper II:* There was no significant difference in birthweight or deviance from expected birthweight between the groups. Perinatal and maternal outcomes were generally good and there was no difference between the groups. *Paper III:* No metabolic or anthropological variables were found to predict pregnancy or live birth after IVF.

Conclusion: A VLCD treatment prior to IVF does not affect the chance of live birth in women with grade I obesity. No detrimental effects of the VLCD on the IVF, maternal, or perinatal outcomes were found. No metabolic or anthropological factors linked to obesity were found to predict pregnancy or live birth after IVF.

Keywords: obesity, infertility, low calorie diet, in vitro fertilization, weight reduction, adipokines

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