Fertility treatment in obese women

Koning, A.M.H.

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Chapter 6

The long-term follow up of children born after a weight reduction program in obese, subfertile women


Research letter
Children born from obese mothers have a higher risk of being macrosomic than children from women with normal weight. [200;201] Macrosomia at birth increases the risk of becoming overweight or obese later in life as well as developing the metabolic syndrome with increased cardiovascular risk and diabetes mellitus. [200] This association is partly associated with the prenatal environment in utero. [202] High maternal prepregnancy BMI is a probable early marker of adult obesity. [203] The number of overweight and obese adults globally is 1.5 billion, with 170 million children being overweight or obese. [156;204]

Hypothetically preconceptional weight loss in obese women could lead to a decrease in childhood obesity. Here we want to evaluate the long-term outcome in terms of overweight and obesity for the children born after our lifestyle intervention in a group of subfertile obese women.

We performed a retrospective cohort study determining the effect of a weight reduction program (WRP) in a general hospital in the Netherlands among obese subfertile women who came for fertility treatment between January 2000 and December 2010 (chapter 4). The intervention group (2005 to 2010, n=102) participated in a WRP for six months prior to assisted reproductive technology (ART), the control group (2000 to 2005, n=100) was advised to lose weight and got ART without delay. The amount of women who lost more than 5% of body weight compared to their baseline weight was 33 (32%) in the intervention group versus 25 (25%) in the control group (crude odds ratio (OR) 1.4 (95% CI 0.73 to 2.7). The live birth rates were significantly higher in the intervention group (n=48 (47%) versus n=37 (37%)) with an adjusted HRR 2.0 (95% CI 1.1 to 3.8).

Four years after the end of the study period, we assessed the growth of the singleton children in these two groups (n=79). We tried to contact the women by telephone and asked the data on body weight and height that were taken at the Youth Health Care (YHC) center at 3, 6, 14, 24, 36 and 45 months of age of their child. The body mass index (BMI) was calculated by the authors for 24, 36 and 45 months. Data was obtained for 42 children. We were unable to reach 17 women, 11 women denied participation, one women had died of an ischemic stroke and eight women had lost the booklets of the YHC. We compared the mean BMIs of the children (table I). In the intervention group
Follow up children

5 (21%) large for gestational age (LGA) were born versus 3 (17%) in the control group (p-value 0.56). Overall, in the intervention group 5 (21%) children were overweight or obese according to the age and gender specific international standards versus 4 (22%) in the control group (p-value 0.60). [205] Figure I graphically shows the mean weights until the age of four years.

In this follow up study of a retrospective cohort of subfertile obese women we did not find a difference in mean weights or BMI in early childhood between the two groups. Weight loss prior to pregnancy is widely propagated for obese women, based on the argument that it achieves healthier pregnancies and children. Our data do not support the idea that the positive impact of (mild) weight loss on fertility in obese women also leads to better outcome for their offspring on the long-term.

Table I

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group (n=24)</th>
<th>Control Group (n=18)</th>
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</thead>
<tbody>
<tr>
<td>Birthweight (grams), mean (SD)</td>
<td>3597 (427)</td>
<td>3365 (555)</td>
<td>0.14</td>
</tr>
<tr>
<td>LGA, n (%)†</td>
<td>5 (21%)</td>
<td>3 (17%)</td>
<td>0.56</td>
</tr>
<tr>
<td>Overweight or obese, n (%)†</td>
<td>5 (21%)</td>
<td>4 (22%)</td>
<td>0.60</td>
</tr>
<tr>
<td>BMI at 24 mnths, (kg/m²), mean (SD)</td>
<td>16.7 (1.1)</td>
<td>16.5 (1.2)</td>
<td>0.54</td>
</tr>
<tr>
<td>BMI at 36 mnths, (kg/m²), mean (SD)</td>
<td>16.3 (1.6)</td>
<td>16.5 (1.3)</td>
<td>0.77</td>
</tr>
<tr>
<td>BMI at 45 mnths, (kg/m²), mean (SD)</td>
<td>16.8 (1.3)</td>
<td>16.4 (1.5)</td>
<td>0.56</td>
</tr>
</tbody>
</table>

SD = standard deviation, † comparison using the Fisher’s exact test
Figure I Mean weights up to 45 months

- Mean weights at different months for the intervention and control groups.
- Error Bars: 95% CI
- Legend:
  - Weight at 3 months (g)
  - Weight at 6 months (g)
  - Weight at 14 months (g)
  - Weight at 24 months (g)
  - Weight at 36 months (g)
  - Weight at 45 months (g)