The Association Between Breastfeeding and Insulin Resistance in Prepubertal Children

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Introduction

- In 2017, The National Survey of Children’s Health stated that 19.1 percent of Louisiana children ages 10 to 17 were obese.
- This percentage is much higher than the national average of 15.8 percent.
- Children with obesity are more likely to suffer from insulin resistance and type II diabetes mellitus.
- The idea of breastfeeding having an influential role in the prevention of obesity is a matter of scientific debate.
- There are limited studies pertaining to the influence of breastfeeding on the development of type II diabetes in young children.
- The purpose of this study was to determine if breastfeeding has protective properties against the development of insulin resistance in prepubertal children which can lead to type II diabetes.

Methods

- Data was collected from children (N=94, male=41, female=53) with a mean age of 8.1±0.8 years.
- The sample study included Black, White, Asian, Pacific Islander, and Hispanic children. However, these groups were separated into “White” and “non-White” due to the low enrollment of non-Black minority groups.
- Height and weight measurements were used to calculate BMI. Fasting insulin and insulin resistance by homeostatic model assessment (HOMA-IR) were measured as well. Mothers were asked via telephone if they breastfed exclusively, formula-fed exclusively, or employed a mixed feeding method.
- Comparisons were made between children who breastfed (n=65) or formula fed (n=33) exclusively via independent samples t-test. Comparisons were also made based on BMI groups (obese, n=73).

Data

<table>
<thead>
<tr>
<th></th>
<th>Study Sample Descriptives</th>
<th>Fasting Insulin (µU/mL)</th>
<th>HOMA-IR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-obese, formula fed (n=19)</td>
<td>10.90%</td>
<td>4.0±0.5</td>
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<tr>
<td>Non-obese, breastfed (n=33)</td>
<td>7.80%</td>
<td>2.6±0.2</td>
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<tr>
<td>Obese, formula fed (n=5)</td>
<td>29.70%</td>
<td>11.3±0.9</td>
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<tr>
<td>Obese, breastfed (n=7)</td>
<td>51.60%</td>
<td>16.1±1.5</td>
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</tbody>
</table>

Figure 1. Description of the study sample based on BMI (obese or non-obese) and infant feeding practice (formula fed or breastfed).

Results

- Fasting insulin and HOMA-IR were higher in non-breastfed children but were not statistically significant.
- Children with obesity had significantly higher average fasting insulin levels and HOMA-IR than those children who were not obese (8.4±0.7 uIU/mL vs. 2.8±1.7 uIU/mL, p<0.001, and 1.7±1.5 vs. 0.5±0.3, p<0.001, respectively).
- Children with obesity who were breastfed had a lower fasting insulin and HOMA-IR than those children with obesity who were formula fed (5.1±1.2 uIU/mL vs. 12.9±8.7 uIU/mL, p<0.05 and 1.0±0.2 vs. 2.7±2.1, p<0.04, respectively).

Conclusions

- Breastfeeding appeared to be beneficial in terms of insulin resistance and the development of type II diabetes with and without obesity.
- New mothers should be encouraged to breastfeed, if possible, with the suggestion that doing so could prevent onset of insulin resistance in their children.
- More studies are needed to determine the precise mechanisms of how breastfeeding reduces risk in children.

References


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