Associations between Maternal Diet during Pregnancy and Newborn Body Mass Index

Research Assistant: William Ye ; Principal Investigator: Xiaozhong Wen, MD, PhD
UB Maternal and Child Health Program, Division of Behavioral Medicine, Department of Pediatrics, JSMBS, University at Buffalo

Introduction

- Nutrition has a major role in both the well-being of mother and child during pregnancy and has a great impact on birth outcomes (Abu-Saad, 2010).
- Smoking pregnant women generally have poorer diet and less intake of nutrients than their non-smoking counterparts, leading to adverse birth outcomes (Mathews, 2000).

Objectives

- To examine the extent of the effect of overall maternal diet in smokers on newborn body mass index (BMI)
- To examine the difference in newborn BMI between a “healthy” and “poor” maternal diet using Mediterranean Diet Guidelines
- To determine the association of each dietary category in relation to newborn BMI

Hypothesis

- We expect a positive association between a greater conformation to recommended guidelines and newborn z-BMI scores.

Methods

- Food Frequency Questionnaire: A pre-test survey was given to pregnant smoking mothers in the UB Pregnancy and Smoking Cessation Study with one portion asking how often they consumed foods of 6 different categories.
- Body Mass Index: Body mass index was calculated using birth weight and lengths obtained from delivery records.

Table 1: Mediterranean Diet Score

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Recommended Servings</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Meat</td>
<td>≥ 2 servings per week</td>
</tr>
<tr>
<td>Red Meat</td>
<td>≤ 2 servings per week</td>
</tr>
<tr>
<td>Dairy</td>
<td>≥ 2 servings daily</td>
</tr>
<tr>
<td>Fruits</td>
<td>≥ 6 servings daily</td>
</tr>
<tr>
<td>Fish</td>
<td>≥ 2 servings per week</td>
</tr>
<tr>
<td>Vegetables</td>
<td>≥ 6 servings daily</td>
</tr>
</tbody>
</table>

Legend to Figure 2: Distribution of Mediterranean Diet Score during pregnancy

Table 2: Mean newborn z-BMI scores, by maternal dietary scores during pregnancy

<table>
<thead>
<tr>
<th>Dietary Score</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.77</td>
<td>0.74</td>
</tr>
<tr>
<td>2</td>
<td>-0.88</td>
<td>0.02</td>
</tr>
<tr>
<td>3</td>
<td>-0.64</td>
<td>0.09</td>
</tr>
<tr>
<td>4</td>
<td>-0.75</td>
<td>0.42</td>
</tr>
<tr>
<td>5</td>
<td>1.00</td>
<td>1.58</td>
</tr>
</tbody>
</table>

Results

- Maternal Dietary Categories

- Maternal Dietary Categories
  - Met Recommendation
  - Did Not Meet Recommendation

Conclusions

- In order for maternal diet to have a significant and positive impact on newborn BMI, the mother needs to meet at least 5 of the recommendations in the Mediterranean Diet.
- Vegetables, followed by fruits, have the greatest positive impacts on the newborn’s BMI.
- Our novel findings need to be confirmed with studies with a larger sample size.

References


Acknowledgements

- Research Assistants
- Health professionals at recruitment sites
- Patients and their families
- Sponsors: NIH CTSA Pilot Fund, UB Department of Pediatrics, CURCA
- Contact: Xiaozhong Wen, MD, Ph.D. (716-829-8611, xiaozhon@buffalo.edu), William Ye (wye3@buffalo.edu)