Food Environment and Birth Outcomes in South Carolina

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Abstract

An increasing number of studies examined the association between neighborhood characteristics and birth outcomes. However, the results can be difficult to compare because of the variety of indicators used to measure the neighborhood. As an important dimension of neighborhood characteristics, food built environment was indicated to associate with residents’ nutrition status, diet quality, and related health outcomes in recent years. In addition, food environment has been found to impact women’s diet quality during pregnancy, which is a key factor to predict birth outcomes. However to date, the studies on food environment and birth outcomes were extremely limited.

This study was sought to examine the association between food environment (evaluated by both neighborhood- and individual-level indicators) and birth outcomes (birth weight, gestational age, low birthweight (LBW) and preterm birth (PTB)) based on all births from 2008-2009 in South Carolina. In order to allow comparison with other studies, a Neighborhood Deprivation Index (NDI) was used to identify the association between neighborhood characteristics and birth outcomes.

First, we used the food desert, a community food access measure developed by US Department of Agriculture (USDA), to evaluate the food
environment and its relationship with the birth outcomes. We found that mothers living in food desert did not have different birth outcomes comparing to those living in high-income and high-food-access areas. Neighborhood income and food access have opposite effects on birth weight. The diverse birth outcomes among different income and food access areas could be mainly explained by race.

Second, we estimated the association between accessibility and availability of various types of food outlets of the mothers and birth outcomes in an eight-county area in South Carolina. The results suggested that accessibility and availability of convenience stores were inversely associated with birth outcomes. No significant associations were captured for healthy food outlets and limited service restaurants. Future investigations with more comprehensive measures of food environment were encouraged.

In the end, we examined the relationship between NDI and birth outcomes using both propensity score matching method and logistic regression models. Propensity score matching (PSM) results suggested neighborhood deprivation was associated with increased risk of LBW among non-Hispanic whites, and with increased risk of PTB among non-Hispanic blacks. However, random effects logistic regression models identified the association between neighborhood deprivation and adverse birth outcomes only among non-Hispanic whites. PSM might be an appropriate approach to avoid off-support inferences. Future research using PSM is encouraged to examine the effect of neighborhood deprivation on birth outcomes.