THE RELATIONSHIPS AMONG ACCULTURATION, BODY MASS INDEX, DEPRESSION, AND INTERLEUKIN 1-RECEPTOR ANTAGONIST IN HISPANIC PREGNANT WOMEN

Objective: The purpose of this study was to determine relationships between acculturation, body mass index (BMI), and depressive symptoms with the Interleukin 1-mediated inflammatory response marker IL-1RA in pregnant Hispanic women at 22–24 weeks gestation.

Design: An observational, prospective design with data collected at 22–24 weeks gestation.

Setting: Public prenatal health clinics and private physician practices in central and south Texas serving low-income women.

Main Outcome Measures: Body mass index (BMI), depression scores on the Center for Epidemiological Studies of Depression (CES-D), years in the United States, the Language Proficiency Scale (LPS), and Interleukin 1 receptor antagonist levels (IL-1RA)

Results: The longer the Hispanic women were in the United States, the higher the IL-1RA levels in plasma (F = 4.55; P = .002). IL-1RA plasma levels were significantly different between low and normal BMI vs overweight and obese categories of BMI (F = 8.54; P < .001). IL-1RA levels were significantly higher between those women who had high scores for depressive symptoms on the CES-D (using a cut off of 20) and those who had scores less than 20 (t-value = -2.41; P = .018). In structural equation modeling, years in the United States significantly positively predicted increased depressive symptoms, increased BMI, and increased IL-1RA levels with a good model fit.

Conclusions: We found that increasing years of residency in the United States is associated with the elevated inflammatory marker IL-1RA, and increased BMI. Increased depressive symptoms also predict IL-1RA levels among Hispanic women at 22–24 weeks of pregnancy. The significance of these findings is discussed in relationship to the development and course of disease. (Ethn Dis. 2007;17:338-343)

Key Words: Acculturation, Body Mass Index, Depression, IL-1RA

INTRODUCTION

The major pro-inflammatory cytokine, interleukin-1(IL-1), and its naturally occurring anti-inflammatory counterpart interleukin-1 receptor antagonist (IL-1RA), have been extensively studied in many diseases, as well as in normal physiological conditions including in pregnancy. Interleukin-1RA may be readily produced in numerous chronic inflammatory and infectious diseases, and increases with increasing levels of its counterpart IL-1. Interleukin-1 (IL-1) has been implicated in the destruction of the islets of Langerhans in the pancreas related to the development of diabetes, the development of atherosclerotic plaques, and inflammation associated with arthritis and colitis. A recent study has identified IL-RA’s role in countering the development of atherosclerosis and metabolism of cholesterol. Therefore, IL-1RA is important as a counter regulator, or balancer, of IL-1 in the development of diabetes, cardiovascular disease, and other chronic diseases.

Determining what factors predict IL-1 and IL-1RA levels is of particular interest. Depression and stress have both been linked to IL-1RA levels in the general population. In obesity there is an increase in the amount of adipose tissue and this has been associated with IL-1RA levels. However, what has not been studied is the effect of acculturation on the inflammatory response in Hispanic women, particularly in relationship to depression and obesity. We hypothesized that acculturation would have an effect on obesity and depression that would influence the effect on IL-1RA, potentially deregulating the immune system that influences the health and well being of pregnant Hispanic women.

There are limited reports about IL-1RA serum and plasma levels in normal, healthy pregnancy. In one report, no significant increase of IL-1RA level was found in healthy pregnant women during the first, second, and third trimester compared to pre-pregnancy levels. However, a significant decrease of IL-1RA occurred from 6 to 12 weeks postpartum, suggesting that the endocrine system is also involved in IL-1RA regulation.

Psychological and physical stressors increase the levels of pro-inflammatory cytokines such as IL-1. IL-1RA levels have been shown to be higher in persons with major depression than in persons in non-depressed control groups. Other studies demonstrated that even with successful antidepressant treatment, serum levels of IL-1RA remained un-