

## **MATERNAL CAROTENOID NUTRITIONAL STATUS IS ASSOCIATED WITH HYPERTENSIVE DISORDERS OF PREGNANCY**

Annie Nguyen<sup>1</sup>, Matthew VanOrmer<sup>1</sup>, Rebecca Slotkowski<sup>1</sup>, Anum Akbar<sup>1</sup>, Taija Hahka<sup>1</sup>, Kara Brown<sup>1</sup>, Braden Fink<sup>1</sup>, Madison Han<sup>1</sup>, Rose McCoy<sup>1</sup>, Dannielle Schutz<sup>1</sup>, Denise Torres<sup>1</sup>, Theresa Trautman<sup>1</sup>, Corrine Hanson<sup>2</sup>, Melissa Theone<sup>1</sup>, Ann Anderson Berry<sup>1</sup>

<sup>1</sup>Department of Pediatrics, University of Nebraska Medical Center, Omaha, NE 68198

<sup>2</sup>College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE 68198

One out of every ten pregnant women are diagnosed with a hypertensive disorder of pregnancy (HDP) including chronic hypertension, gestational hypertension, or preeclampsia. HDP is associated with maternal and infant morbidities including preterm birth, low birth weight, and death. Carotenoids and tocopherols are essential nutrients that play an important role in fetal growth and development as well as regulation of inflammation during pregnancy, suggesting that these nutrients could protect infants from the morbidities associated with HDP. Nutrition in hypertensive women is vital to control blood pressure and prevent development of further pregnancy complications. Adequate carotenoid and tocopherol nutritional status is associated with a decreased risk for poor infant health outcomes, but little is known about the relationship between these essential nutrients and maternal hypertensive status. We hypothesize that the median maternal plasma concentrations of carotenoids and tocopherols will be lower in women with HDP compared to normotensive women. Maternal plasma samples were collected from mothers at time of delivery analyzed using HPLC for lutein + zeaxanthin, b-cryptoxanthin, lycopene (trans-, cis-, and total),  $\alpha$ -carotene, b-carotene (trans-, cis-, and total), vitamin A (retinol), and vitamin E ( $\alpha$ -tocopherol,  $\gamma$ -tocopherol, and  $\delta$ -tocopherol). The American College of Cardiology and American Heart Association's guidelines were used to classify women into chronic hypertension, gestational hypertension, or normotensive groups. A Kruskal-Wallis test was performed to compare median Vitamin A and carotenoid concentrations between normotensive mothers and mothers with chronic or gestational hypertension. A p-value  $<0.05$  was considered statistically significant. In this cohort of 218 pregnant women, 12.4% had chronic hypertension and 26.1% had gestational hypertension. Median maternal serum levels of b-cryptoxanthin ( $p=0.01$ ), cis-lycopene ( $p=0.1$ ), total lycopene ( $p=0.03$ ),  $\alpha$ -carotene ( $p<0.01$ ), trans-b-carotene ( $p=0.01$ ), cis-b-carotene ( $p=0.02$ ), and total b-carotene ( $p=0.03$ ) differed significantly between normotensive, chronic hypertension, and gestational hypertension groups, with normotensive mothers having higher median carotenoid plasma concentrations than hypertensive mothers. There were no significant associations shown between hypertensive status and maternal plasma concentrations of lutein + zeaxanthin, trans-lycopene, retinol,  $\alpha$ -tocopherol,  $\gamma$ -tocopherol, or  $\delta$ -tocopherol. This preliminary study demonstrates that mothers with chronic or gestational hypertension have lower plasma concentrations of carotenoids, which could potentially contribute to infant morbidities such as preterm birth. More research is needed to evaluate how dietary interventions during pregnancy may prevent the morbidities associated with HDP and improve infant health.