

## ROLE OF CAROTENOID AND RETINOL INTAKE AND PLASMA LEVELS IN PERINATAL DEPRESSION OF NICU MOTHERS

Kara Bown<sup>1</sup>, Madison Han<sup>1</sup>, Rose McCoy<sup>1</sup>, Braden Fink<sup>1</sup>, Denise Torres<sup>1</sup>, Theresa Trautman<sup>1</sup>, Annie Nguyen<sup>1</sup>, Danielle Schutz<sup>1</sup>, Matthew VanOrmer<sup>1</sup>, Rebecca Slotkowski<sup>1</sup>, **Anum Akbar**<sup>1</sup>, Taija Hahka<sup>1</sup>, Melissa Thoene<sup>1</sup>, Corrine Hanson<sup>2</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

Carotenoids are fat-soluble nutrients found primarily in fruits and vegetables and act as potent antioxidants. Studies have shown that the antioxidant properties of carotenoids may have protective effect on neural tissue and on depressive symptoms in adults. However, little is known about the impact of carotenoid status on depressive symptoms in pregnant women. The purpose of this study was to evaluate the relationship between maternal dietary carotenoid intake and plasma levels with Edinburgh Postnatal Depression Scale scores. An IRB-approved study enrolled 83 women presenting for delivery at a Midwestern academic medical center whose infants were admitted to the NICU. Maternal plasma was collected at time of delivery and high-performance liquid chromatography was used to quantify carotenoid concentrations. Dietary intake was quantified via the Harvard Food Frequency Questionnaire. Edinburgh Postnatal Depression Scale (EPDS) scores conducted nearest to delivery were collected from the medical record. Spearman correlations were used to assess the relationship between carotenoid plasma levels and dietary intake with EPDS score. Mann-Whitney U tests were used to compare maternal carotenoid intake and plasma levels between EPDS groups (<10 vs ≥10). A p-value <0.05 was considered statistically significant. There was a statistically significant positive correlation between plasma retinol levels and Edinburgh Postnatal Depression Screen scores (R=0.370, p=0.02) - no other carotenoid exhibited this correlation. Maternal plasma retinol was significantly higher in mothers at risk of depression based on EPDS score than non-depressed mothers (318.7 ug/L vs 247.3 ug/L, p = 0.02). No significant differences were observed between EPDS groups for any other carotenoid. Dietary intake of β-carotene was elevated in the at-risk group vs the non-depressed group, but this difference only approached significance (8176 mg/d vs 5760 mg/d, p = 0.06). No differences were observed between dietary intake of α-carotene, lycopene, lutein and zeaxanthin, β-cryptoxanthin, or retinol activity equivalents between EPDS groups. In contrast to our initial hypothesis; a positive correlation was observed between maternal retinol levels and post-partum depression. This may be attributed to increased accumulation of retinol during the third trimester of pregnancy, impairing the function of Retinol Binding Protein that transports Vitamin A to other tissues. Coincidentally, circulating levels of retinoic acids and retinyl esters increase and are mediated in areas of brain also implicated in the pathophysiology of depression. Further investigation with a larger sample size is warranted to confirm these relationships.