

Lutein Concentrations in Preterm Human Milk and Retinopathy of Prematurity: a Prospective Observational Study

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BACKGROUND

- Retinopathy of prematurity (ROP), a major cause of visual impairment and blindness, is a retinal neovascular disorder affecting preterm infants (PTI). Oxidative stress has been implicated in the pathogenesis of ROP. Lutein, the major carotenoid found in the human eye, is thought to have a protective role against oxidative and light damage.
- Lutein is supplied to PTI by human milk (HM).

AIMS

- We conducted a prospective study to investigate the correlation between levels of lutein in HM and the occurrence and severity of ROP in PTI. We performed a longitudinal analysis of carotenoids: Lutein, Zeaxanthin, Beta-Carotene and Lycopene, in preterm HM.

METHODS

- This prospective study was approved by our local Institutional Review Board, and a written informed consent was obtained from all participants. Healthy exclusively lactating mothers of PTI born at gestational age 24+2 weeks to 29+6 weeks or with birth-weight under 1500 grams were recruited. Participant provided up to 7 HM samples (2-10ml) at day 0-3 (Colostrum), and once a week until 6 weeks. A plasma sample was prepared from 1 ml blood collected from the infant at week 6, during NICU routine blood test when available.
- Samples were analyzed by modified HPLC methodologies.

RESULTS

- Included were 39 mother-infant-dyads, enrolled between 2018 and 2020, who generated 184 HM samples and 22 plasma samples. Seven infants developed ROP. Lutein, zeaxanthin, beta-carotene and lycopene concentrations decreased as lactation progressed. There were no correlation between lutein levels in HM samples and ROP (e.g. at week 2, $p=.757$ and at week 4, $p=.276$). Plasma beta-carotene and lycopene levels correlated with those seen in HM samples at week 6 ($p<.001$ and $p=.006$, respectively).

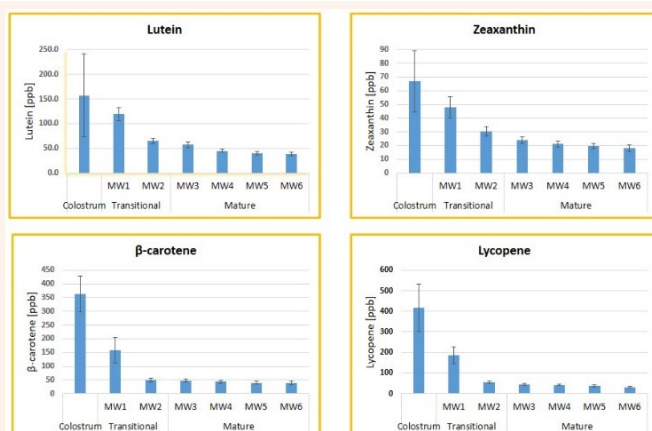


Figure 1: Levels of carotenoids in preterm human milk samples per lactation stage in ppb (ng/ml)

CONCLUSION

- No correlation was found between lutein content in preterm HM during the first 6 weeks of lactation and the occurrence of ROP.