Impact of WIC and SNAP Enrollment on Gestational Choline

Methodology

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Background

- The gestational environment and compromise of maternal wellbeing can impact fetal development
- Therapeutic intervention during gestation has not yet been optimized as a risk reduction practice.
- Choline is a micronutrient naturally found in a variety of foods and may be synthesized and stored by the human liver.
- Choline is actively transported across the placenta through maternal serum and utilized in critical periods of fetal neurodevelopment.
- Recommended Adequate Intake (AI) for pregnancy and breastfeeding is 550 mg/day, respectively
  - Corresponds with maternal serum levels ≥ 7.5 μM
- It is estimated less than 10% of pregnant individuals achieve daily AI of choline.
- Choline is generally not adequately supplemented by current prenatal vitamin formulations.
- Vegan and Vegetarian individuals may be at increased risk for inadequate intake.
- Individuals experiencing food insecurity may also be at increased risk.
- Recent data suggest utilization of Special Supplementation Nutrition Program for Women, Infants, and Children (WIC) may correlate with suboptimal micronutrient intake, including that of choline.
- Further research on WIC and/or Supplemental Nutrition Assistance Program (SNAP) utilization and choline intake during pregnancy and lactation is warranted.

Objectives

- Describe the relationship between maternal choline levels measured during gestation with WIC and/or SNAP status during the same time period.
- Determine whether WIC and/or SNAP status can help identify additional nutritional needs during gestational and lactation periods.
- Advocate for nutritional support based upon needs identified (i.e., specific supplementation access or expansion of existing nutritional supplementation programs).

Choline may alter the activation of α7-nicotinic cholinergic receptor (CHRNA7 gene), which promotes maturation of excitatory and inhibitory neurocircuits – can be impaired/incomplete in schizophrenia. CHRNA7 gene has also been associated with other psychiatric diagnoses including ASD and ADHD.

Study Design

- Retrospective Cohort Study
- Data groups will include:
  - WIC, SNAP, WIC + SNAP, non-utilization

Participants

- Pregnant individuals were identified through Denver Health prenatal clinic.
- Pregnancies confirmed by ultrasound prior to 16 wks gestation.

Exclusion Criteria

- Fetal anomaly, severe intrauterine growth restriction, corticosteroid use.

Choline Levels

- Measured via maternal blood sample obtained at 16 weeks gestation.
- Adequate or below adequate choline intake is correlated with maternal serum levels of < 7.5 μM and ≥7.5 μM, respectively.

WIC and/or SNAP status during pregnancy

- Identified via retrospective chart review

Statistical Analyses

- Adequacy in maternal serum choline levels will be determined in all data groups: WIC, SNAP, WIC-SNAP, or non-utilization.
- Existing differences in groups will be determined through Fischer Exact Test, or t-test.

Selected References