Discussion and Comments Understanding the Microbiome in Women's Health

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Suggested Clinical Practice

- Be educated about and have index of suspicion for gluten sensitivity disorders
- Be alert for extra-intestinal manifestations of celiac and non-celiac sensitivity

Suggested Clinical Practice

Dietary Fiber

Abundance

Variety

Suggested Clinical Practice

Fermented Foods

- Variety
- Small amounts adequate
- Live cultures
- Weight management, insulin sensitivity, anxiety

Suggested Clinical Practice

Prebiotic Supplements

- Consider for immune, metabolic disorders, weight management, anxiety/stress
- START WITH LOW DOSE and increase gradually
- Theoretical concerns of decreasing diversity – context of dietary counseling re fiber
- Play with genome sequencing of your MB

Suggested Clinical Practice

- Use probiotics where there is abundant evidence on benefits
  - Utilize guidelines to select probiotic strains for specific indications
- View inflammatory disorders as signs of gut dysbiosis, consider prebiotics, probiotics, fermented foods, dietary fiber
  - Anxiety, depression, Obesity, diabetes

Suggested Clinical Practice

- Carefully consider evidence and clinical indications for each antibiotic prescription
  - Decrease presumptive Rx of UTI
  - Avoid unnecessary use of abx for URI

    Consider learning about the evidence-based use of herbal medicine for URI management
- Give probiotics with antibiotics to:
  - Decrease risk AAD and *C. difficile*
  - Decrease inflammation, heal gut mucosa

Suggested Clinical Practice

- Narrowest spectrum and shortest duration
- Avoid Rx of Asymptomatic BV in Pregnancy
- Use clinical triggers to minimize duration of exposure to IAP
  - Exposure > 24hr linked w atopic disease
- Investigate risk scoring strategies for antibiotic prophylaxis at Cesarean, MROP

Suggested Clinical Practice

- Decrease GBS Colonization
  - Support preg MB and immune function
    - Fermented foods, fiber
  - Consider probiotic in early 3rd trimester
    - Esp if high risk for GBS
    - *L. rhamnosus* GR-1 and *L. reuteri* RC-14
- Develop decision aids for IAP
- Use probiotics to treat/augment treatment for Bacterial Vaginosis

ESTROGEN METABOLISM

L rhamnosus GR-1 and L reuteri RC-14 – not vaginal

- Anti-inflammatory effects in IBD patients (Lorea Baroja)
- Improves diarrhea in persons with HIV/AIDS (Anukam 2008)
- Decreases mercury and __ uptake in pregnancy

Prevention/treatment of mastitis

- Prevention: Probiotic 30 weeks GA until birth
  - Mastitis in first 3 months postpartum decreased:
    - 25% probiotic, 47% placebo P=0.001
  - Infections less severe w probiotic
    - lower colony counts and pain scores
    - *L salivarius* PS2, available commercially

- Treatment:
  - Cure higher in probiotic than antibiotic group
    - by colony counts ($p<0.01$)
    - By pain symptoms
  - Recurrence rate higher in abx group ($p< 0.001$)
  - *L fermentum* CECT5716 or *L salivaris* CECT5713

Fernández et al (2016). Clinical infect dis, 62(5), 568-573; Arroyo et al(2010). Clin infect ds, 50(12), 1551-1558.

Vaginal chlorhexidine during labor for GBS prevention

- Four studies, 1125 infants, term and preterm
- No difference in early-onset GBS disease
- May be a reduction in neonatal colonization with GBS
- Low quality evidence
- Wipes out normal flora

Ohlsson, Shah & Stade 2014 Cochrane Review

PROBIOTICS IN PREGNANCY REVIEW OF EVIDENCE

Maternal Outcomes

- Gestational Diabetes
- Preeclampsia
- Reduced risk mastitis
- Reduced postpartum central adiposity

Outcomes in the offspring

- Reduced risk of eczema
- Restoration of MB in Cesarean-born infants

Probiotics in pregnancy and maternal outcomes: a systematic review

- Six RCT's, one prospective cohort study
- Significant reductions in:
  - Maternal fasting glucose
  - Incidence of GDM
  - Incidence of preeclampsia
    - Severe preeclampsia OR 0.61, 95% CI 0.43-0.89
  - Levels of C-reactive protein
  - Central adiposity at six months postaprtum (OR 0.30)

Lindsay KL, Walsh CA,Brennan L and FM McAuliffe 2013; VanderVusse L et al 2014

GDM and probiotics:

Decreased GDM incidence three-fold (Luoto)

- 13% w probiotic 36% with no intervention p=0.003
- Also reduced fetal macrosomia
- *L rhamnosus GG* and *B lactis* Bb12
- Single products available, Nestle just filed for a patent for this combo

- In women with GDM:
  - Improved FPG, serum insulin, insulin sensitivity in women with GDM, all statistically significant (Karamali; Dolatkhan)
  - Six weeks of L acidophylus, L casei, B Bifidum vs placebo
  - Modulate inflammatory markers in GDM (VSL3)
  - Decrease wt gain and FBG

Karamali et al (2016). *Diabetes & metabolism*, 42(4), 234-241. Jafarnejad et al(2016). *Jo Nutri Metabolism,* 2016, 5190846-5190846; Luoto et al (2010). British Jo Nutrition, 103(12), 1792-1799; Dolatkhah et al (2015). Jo Health, Pop Nutr, 33, 25-25

Probiotics: Reduced postpartum central adiposity and blood glucose

- Dietary counseling plus probiotic or placebo, first trimester
  - Central adiposity: risk lower at 6 mo postpartum
    - OR 0.03; 95% CI 0.11-0.85
  - Glucose regulation better during pregnancy and until 12 months postpartum
    - P=0.013
  - L *rhamnosus GG* ATCC53103 and *B lactis*

Ilmonen et al(2011). Clinical nutri, 30(2), 156-164;
Laitinen e al (2009). British Jo Nutr, 101(11), 1679-1687.

Suggested Clinical Practice

- Consider use of prebiotics, fermented foods, dietary fiber and probiotics as a supportive measure in prevention and treatment of diabetes

Eczema risk in offspring

- Prenatal probiotic use decreased incidence eczema
- World Allergy Association: approved for prevention of eczema if there is a family history of eczema
- Less evidence for asthma, food allergy, allergic rhinitis
- Effective species:
  - L rhamnosus GG 53103
  - Bifidobacteria lactis Bb-12

West, Jenmalm et al 2016; Kuitunen et al 2009, Pelucchi et al 2012,, Panduru et al 2015; Kalliomäki et al (2003) The Lancet, 361(9372), 1869-1871

Suggested Clinical Practice

- Consider prenatal use of probiotics for decreased risk of eczema in the offspring, in women with a family history of allergic disease