Peripartum Psychiatry

Supporting Family Mental Health During a Critical Time of Development

Peripartum Psychiatry

All the Usual Things of Psychiatry Only Now You have the Complexity of the Peripartum Period
Introductions

Mary C. Kimmel, MD
Assistant Professor, UNC Department of Psychiatry
Director, Perinatal Psychiatry Program
Medical Director, NC MATTERS

Karen N. Burns, MSW, LSCWA
Research Instructor, UNC Department of Psychiatry
Program Manager, NC MATTERS
Program Coordinator, Attachment Network of North Carolina

Disclosures

PI of independent investigator research study of brexanolone and postpartum psychosis funded by Sage Therapeutics
Spouse has stock with Abbvie Labs as part of his retirement portfolio
Objectives

• Participants will be able to formulate the “risk”/“risk” analysis discussion with patients about any medications their patients may take during pregnancy and with lactation.

• Participants will be able to increase knowledge of what is known (and not known) of some newer and older medications in pregnancy (e.g., LAI, Lithium).

• Participants will increase knowledge base about the use of brexanolone and supplements (e.g., probiotics).

EH is a 38-year-old who is 2-months postpartum with her first baby. At her well child visit, she complains of pain and latch issues in breastfeeding, and is also found to have an Edinburgh score of 18. The pediatrician referred the patient to a lactation consultant, encouraged sleep hygiene/self-care strategies, and encouraged EH to follow up with her existing therapist. In addition, her Ob/Gyn started her on an SSRI antidepressant.

At 6-months postpartum, EH tells the pediatrician that she was discharged from OB care and now sees her PCP. She does not feel that her PCP is effective in addressing her postpartum mood symptoms. She says she is having upsetting images of a scissors in her son’s head. EH is reluctant to say she now feels more irritable, “out of control,” and “explosive;” and as this has worsened she has started increasing her alcohol intake to get to sleep.

Her additional concerns include: financial strain, marriage strain, strain with her mother who has bipolar disorder, hair loss, and low sex drive. She has tried to reconnect with her therapist, but has not been successful in getting an appointment. EH is motivated to build a care team, but does not know where to go for support.
Women’s Reproductive Lifecycle
"Normal" Psychological Changes in Peripartum

- First Trimester: Mild anxiety (ambivalence, worry), changes in energy, appetite, libido
- Third Trimester: increased anxiety about labor and delivery, impending role change
- Pregnancy and Postpartum:
  - Mild forgetfulness, confusion, distractibility
  - Worry: health of baby, responsibilities, finances etc.
  - Heightened awareness of prior relationships, losses, esp. family of origin
Hormonal Changes in Peripartum

Internal environment

- **Hormonal fluctuations**
  - Estrogen + Progesterone - rise dramatically in 3rd trimester, fall even more dramatically at parturition
  - Oxytocin – rises during labor - role in attachment, lactation
  - Hyperactive HPA Axis with high plasma cortisol

- **Brain Circuitry Changes**
  - Increased neuronal activity - increased vigilance and protectivity
  - More sensitive reward and motivation circuitry - increased sensitivity to infant cues

External environment

- Body
- Mind
- Relationships
- Work
- Sleep

Part 1: "Risk/Risk" Discussions
The Perinatal Depression “Treatment Cascade”

50-70% of cases go undetected

85% of cases go without treatment

91-93% of cases are not adequately treated

95-97% of cases are without remission of symptoms

Perinatal/Postpartum Anxiety is the most common PMAD and often goes undiagnosed.

Symptoms to look for include:

- Excessive worrying
- Racing thoughts
- Feelings of dread
- Feeling overwhelmed
- Obsessive thoughts
- Rapid heartbeat

Symptoms that often are mistaken as normal during pregnancy and postpartum:

- Difficulty concentrating
- Trouble sleeping
- Changes in eating/sleeping patterns
- Sense of memory loss
- Nausea, dizziness, hot flashes
- Irritability
- Persistent fatigue

1 Misri, S., Abizadeh, J., Sanders, S., & Swift, E. 2015
Intrusive Thoughts

What would happen if I left the baby in the bathtub and walked away?

I keep imagining dropping the baby while I walk down the stairs.

I keep imagining myself on a respiratory.

I keep imagining scissors sticking out of my son’s head.

How do you feel when patients share this with you?

(Some of the) Spectrum of Disorders in the Peripartum Period

Depression
Anxiety
Panic Disorder
Obsessive Compulsive Disorder
Post Traumatic Stress Disorder
Bipolar Disorder or Primary Psychotic Disorder
Postpartum Psychosis
## Consequences of Not Treating During Pregnancy

**Pregnancy is not protective!**

<table>
<thead>
<tr>
<th>Increased impulsivity, substance abuse, poor nutrition and self-care</th>
<th>Increased risk for preeclampsia, pre-term births, low birth weight, IUGR</th>
<th>Congenital defects/ malformations; toxic stress of the newborn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disability depression or anxiety</td>
<td>Suicidality, self-injury</td>
<td>Psychotic symptoms, poor judgment, delusional beliefs</td>
</tr>
<tr>
<td>Infanticide</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Consequences of Not Treating Postpartum

<table>
<thead>
<tr>
<th>Toxic stress of the newborn</th>
<th>Lactation failure</th>
<th>Insecure attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor bonding</td>
<td>Lower cognitive scores in the child</td>
<td>Affect dysregulation in the child</td>
</tr>
<tr>
<td>Increase rates later in life of suicidality</td>
<td>Higher rates of ADHD and conduct disorder in the child</td>
<td>Impacts on Family Dynamics, higher rates of divorce and other discord</td>
</tr>
</tbody>
</table>
PMADs and Families

• Partners are affected by postpartum depression by supporting and coping with their partner’s symptoms:
  • Confusion
  • Anger
  • Fear
  • Feeling overwhelmed

• May also experience depression:
  • 1 in 10 fathers experience depression in the first year

What's to be done?

• Screening by providers who know how to treat or where to make appropriate referrals
• Initiate or optimize treatment for identified patients
• Treatment to remission
### Integrated Physical and Mental Prenatal Care

<table>
<thead>
<tr>
<th>Physical Health Screening/Tests Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Prenatal Labs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mental Health Screening Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review mental health history; Make a mental wellness plan</td>
</tr>
</tbody>
</table>

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### Psychotropic Medications

- **Goal** – minimization of risk
- Risk of untreated maternal illness on the mother and the fetus vs. Risk of medications in pregnancy
- **No decision is risk-free**
- Use **lowest effective dose** but goal is symptom remission
- Remember that may need higher doses as pregnancy progresses due to increased plasma volume and rate of clearance → BUT THIS IN PART DEPENDS ON RELATED HEPATIC CYP
Risk of Medication Exposure in Pregnancy

- All medications transmit to the placenta in varying amounts; no psychotropic is FDA approved for use in pregnancy
- Though FDA currently changing from “Categories” (i.e. C, X) to defining risks/benefits of medications
- Concerns of patients include:
  - Risk of malformations (beyond 2-4% risk in general population off medication)
  - Risk of toxicity and/or withdrawal
  - Risk of long-term developmental outcomes
- Mothertobaby.org

Risk of Medication Exposure in Breastmilk

- Exposure in breastmilk less than through placenta
- If starting new medication postpartum, most antidepressants/antianxiety medications (SSRIs are first-line) are compatible with breastfeeding and felt to be safe
  - Sertraline (Zoloft) is likely negligible into milk at doses of 100 mg and less
- LACTMED database from NIH
You may have heard that “Preferred medications during the perinatal period include sertraline and citalopram. Breastfeeding is encouraged with sertraline as preferred medication.”

However, if woman is stable on another AD, switching is not recommended.

Could lead to relapse (don’t know if new AD will work) and exposure to more meds.
## Treatment Algorithm Perinatal Depression

### Pharmacologic Treatment of Perinatal Depression

**SSRIs**

<table>
<thead>
<tr>
<th>Generic Names</th>
<th>Trade Name</th>
<th>Dosage Range</th>
<th>Unique Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sertraline</td>
<td>Zoloft</td>
<td>50-200 mg, increase by 25 mg or 50 mg for very anxious patients 12.5 mg</td>
<td>Due to half-life, small, even negligible amounts transmitted into breast milk</td>
</tr>
<tr>
<td>Fluoxetine</td>
<td>Prozac</td>
<td>20-80 mg, increase by 10 mg or 20 mg</td>
<td>Longer half-life — withdrawal less likely if doses are missed, but also longer to get out of the system if there are adverse effects, likely greater amount in breast milk, thought to be more activating</td>
</tr>
<tr>
<td>Citalopram</td>
<td>Celexa</td>
<td>20-40 mg, increase by 10 mg or 20 mg</td>
<td>FDA Drug Safety Communication that &gt; 40 mg could result in life-threatening heart arrhythmia.</td>
</tr>
<tr>
<td>Escitalopram</td>
<td>Lexapro</td>
<td>10-20 mg, increase by 5 mg or 10 mg</td>
<td></td>
</tr>
<tr>
<td>Paroxetine</td>
<td>Paxil</td>
<td>10-60 mg, increase by 10 mg or 20 mg, CR in 12.5 mg doses</td>
<td>Older data demonstrated potential for a 1.5 to 2.0 fold increase risk in cardiovascular malformations, leading to a 2005 warning. Recent data show no consistent information to support teratogenic risks</td>
</tr>
<tr>
<td>Fluvoxamine</td>
<td>Luvox</td>
<td>25-150 mg, increase by 25 mg</td>
<td>More often used for treatment of obsessive compulsive disorder</td>
</tr>
</tbody>
</table>
### SNRIs

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Dosage</th>
<th>Unique Considerations/Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venlafaxine</td>
<td>Effexor, Effexor XR</td>
<td>37.5-375mg, increase by 37.5mg</td>
<td>Older and most data available</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>Cymbalta</td>
<td>20-120mg, increase by 20mg-30mg</td>
<td></td>
</tr>
</tbody>
</table>

### Other Antidepressants

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Dosage</th>
<th>Unique Considerations/Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bupropion</td>
<td>Wellbutrin SR, Wellbutrin XL, Zyban, Aplenzin, Forfivo XL</td>
<td>150-450 mg, increase by 150 mg, SR BID dosing</td>
<td>Not to exceed 450 mg due to increased risk of seizure. Helpful in smoking cessation and even evidence for lowering prematurity risk for smokers. May help ADHD and other addictive disorders, such as overeating.</td>
</tr>
<tr>
<td>Mirtazapine</td>
<td>Remeron</td>
<td>15-45 mg, increase by 7.5 mg, 15 mg</td>
<td>Antiemetic effects in addition to antidepressant and anxiolytic effects, and helps with sleep and decreased appetite</td>
</tr>
<tr>
<td>Trazodone</td>
<td>Oleptro, Desyrel, Serzone</td>
<td>50-400 mg, ½ tablet (25 mg)-100 mg for sleep</td>
<td>Sleep aid at lower dosages, higher dosages more antidepressant affects. No differences in the rate of major malformations</td>
</tr>
</tbody>
</table>
**Mood Stabilizers**

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Dosage</th>
<th>Unique Considerations/Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamotrigine</td>
<td>Lamictal</td>
<td>&gt;50mg, start at 25mg daily and increase by 25mg every 2 weeks (decrease risk of Stevens-Johnson syndrome)</td>
<td>Augmentation in TRD, OCD, possible OCD, mood dysregulation, aggression in BPD (often comorbid with MDD)</td>
</tr>
<tr>
<td>Atypical antipsychotics (aripiprazole, quetiapine, olanzapine...)</td>
<td>Abilify, Seroquel, Zyprexa...</td>
<td>Increase by 150mg or 300mg, therapeutic blood level 0.4-0.8 (depression) and 0.8-1.2 (mood stabilization)</td>
<td>Inc. likelihood of remission when used for augmentation; when controlling for other factors exposure does not associate with increased risk OB complications except GDM</td>
</tr>
<tr>
<td>Lithium</td>
<td></td>
<td>Increase by 150mg or 300mg, therapeutic blood level 0.4-0.8 (depression) and 0.8-1.2 (mood stabilization)</td>
<td>Monotherapy and augmentation MDD&lt; also bipolar disorder and PPP</td>
</tr>
</tbody>
</table>

**Antipsychotics**

Brand, Haverman, de Beer, de Boer, Dazzan, Sommer. Psychol Med. 2021 Nov 12:1-15
## Antipsychotics

### Table 1. Summary of drug-specific pharmacokinetic properties, side-effects and contraindications in women

| Drug            | Mechanism | CYP activity in humans compared to males | 
|-----------------|-----------|-----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                 |           |                                         |          | \( \text{P-gp binding} ^{55} \) | \( \text{QSAR prediction} \) | \( \text{Prolactin elevation} \) | \( \text{EPS and akathisia} ^{56} \) | \( \text{Weight gain} ^{57} \) | \( \text{Hypothalamic abnormalities} ^{58} \) | \( \text{Risk of neurodevelopmental deficits} \) |
| Antipsychotics  |           |                                         |          | \( \text{\% normal secretion} \) | \( \text{\% normal absorption} \) | \( \text{\% normal distribution} \) | \( \text{\% normal metabolism} \) | \( \text{\% normal excretion} \) | \( \text{\% normal elimination} \) | \( \text{\% normal elimination} \) | \( \text{\% normal elimination} \) |
| Aripiprazole    | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Chlorpromazine  | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Clozapine       | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Haloperidol     | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Lorazepam       | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Olanzapine      | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Paliperidone    | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Quetiapine      | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |
| Ziprasidone     | CYP2D6,  | \( 0, \times 4 \)                      | \( 0.05 \) | \( 1.1 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) | \( 0.05 \) |


Brand, Haverman, de Beer, de Boer, Dazzan, Sommer. Psychol Med. 2021 Nov 12:1-15
• 1st drug FDA approved specifically for Postpartum Depression
  • Inpatient admission required
• Consider for...
  • Moderate to severe PPD
  • Symptom onset during the 3rd trimester or within 6 months postpartum
  • May have co-morbidities such as anxiety, OCD, PTSD
  • Symptom onset during the 3rd trimester or within 6 months postpartum

Brexanolone (Zulresso)

• UNC Perinatal Psychiatry Program offers Zulresso (Brexanolone)
• 60-hour infusion on medical unit
• Only available through a restricted program called Zulresso REMS (Risk Evaluation and Mitigation Strategy), due to risk of excessive sedation or sudden loss of consciousness during administration
• Costly; requires insurance approval, Medicaid does cover in NC
Exclusion criteria:
- Bipolar disorders, psychotic disorders, current substance abuse disorders
- Active SI with plan or intent
- Pregnant
- Renal impairment (eGFR < 15 mL/min/1.73 m²)

### Brexanolone (Zulresso)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Statistic N = 16</th>
<th>HAM-D score baseLine (SD)</th>
<th>HAM-D score postInfusion (SD)</th>
<th>Statistic N = 13</th>
<th>HAM-D score at follow-up (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of psychiatric comorbidity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>8.5 (8)</td>
<td>8 (8)</td>
<td>3</td>
<td>10 (7)</td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
<td>8.4 (8)</td>
<td>8 (8)</td>
<td>9</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Psychiatric history (diagnoses not exclusive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous major depressive disorder</td>
<td>8</td>
<td>9 (8)</td>
<td>7 (9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous prepartum depression</td>
<td>8</td>
<td>6 (8)</td>
<td>4 (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>5</td>
<td>10 (5)</td>
<td>5 (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posttraumatic stress disorder</td>
<td>2</td>
<td>12 (4)</td>
<td>1 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borderline personality disorder</td>
<td>1</td>
<td>10 (8)</td>
<td>0 (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current psychiatric treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>3</td>
<td>10 (9)</td>
<td>1 (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single SSRI or SNRI</td>
<td>7</td>
<td>10 (3)</td>
<td>5 (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRI/SNRI and 1 additional standing psychotropes</td>
<td>3</td>
<td>7 (3)</td>
<td>2 (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRI/SNRI and 2 or more additional standing psychotropes</td>
<td>5</td>
<td>6 (8)</td>
<td>3 (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzodiazepine Use</td>
<td>4</td>
<td>7 (5)</td>
<td>2 (6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HAM-D Score Range**

- **Pre-Infusion**
  - HAM-D Score: 25
- **Post-Infusion**
  - HAM-D Score: 10
- **Follow-Up**
  - HAM-D Score: 3
Effect of Lactobacillus rhamnosus GG in Pregnancy on Postpartum Symptoms of Depression and Anxiety: A Randomised Double-Blind Placebo-Controlled Trial

K.F. Stenges*, J. Dood* & K. Wickersham, M.D.

Abstract

Background: Prevalence rates of perinatal depression and anxiety are high, with many women experiencing symptoms in the postpartum period. Despite this, studies examining the effects of probiotics on perinatal depression and anxiety are sparse. The aim of this study was to evaluate the efficacy of Lactobacillus rhamnosus (LGG) given in pregnancy and prevention of postpartum symptoms of depression and anxiety in the postpartum period. This was a randomised, double-blind, placebo-controlled trial.

Methods: All women who were pregnant and enrolled in the LactoPrevent Study (NTR2787) were eligible to participate in this study. Women were randomised to receive either LGG (N=127) or a matched placebo (N=128) in the second trimester of pregnancy. Participants were followed up at both 1 and 3 months postpartum.

Results: A total of 238 women (LGG: n=127, Placebo: n=111) were included in the analysis. Women who received LGG had significantly lower levels of anxiety (P=0.015) and depression (P=0.007) compared to the placebo group at 1 month postpartum. The effect of LGG on anxiety was sustained at 3 months postpartum (P=0.021).

Conclusion: Lactobacillus rhamnosus (LGG) given in pregnancy may be a beneficial intervention for the prevention of postpartum symptoms of depression and anxiety.

*Equal contribution

Keywords: Lactobacillus rhamnosus, postpartum depression, anxiety, prevention

Funding: This study was funded by the European Foundation for Nutrigenomics and Nutrigenetics (EFN"

Research paper: "Probiotics"
Probiotics

Efficacy of Direct or Indirect Use of Probiotics for the Improvement of Maternal Depression During Pregnancy and in the Postnatal Period: A Systematic Review and Meta-Analysis

Klavdia Čuček-Teškovec 1, Dalanka Miletic-Turk 1, Sergej Krivec 1, Maja Straus 2, Hannah G. Dahlen 3, Juan P. Aznave 4,5,6,7,8 and Sahila Rijan 1,4,5

Abstract: The mother and infant form a unique bond, with maternal mental health affecting the interactions with the infant and infant behaviors impacting maternal mental health. One of the possible mechanisms influencing maternal mental health is the manipulation of the gut brain axis by consuming probiotic supplements. Probiotics can also have an indirect influence on maternal mental health via the modulation of the infant microbiome and consequently improving the infant’s health and thus indirectly leading to an improvement in maternal mood. This systematic review evaluated the efficacy of probiotics on maternal mental health by searching for randomized controlled trials via international databases: Cochrane Library, PubMed, Scopus, ScienceDirect, and Web of Science until January 2022. A meta-analysis was performed using the Cochrane Collaboration methodology where possible. We found seven clinical trials that included the most probiotics and addressed maternal depression and/or anxiety. Of these, five trials investigated the influence of maternal probiotic supplementation on the gut-brain axis. Two trials investigated the indirect influence of probiotics on maternal depression via supplementation of probiotics by infants and subsequent influence on the crying of colicky infants. Meta-analysis of two studies of pregnant and postnatal women and two studies of infants consuming probiotics on the outcome of the Edinburgh Postnatal Depression Scale for mothers showed no statistical differences. The findings indicate that maternal depression is very complex and is influenced by various bidirectional factors. One of the factors that can improve maternal mental health is probiotics, however, careful consideration must be given to correct trials selection in strata-specific effectiveness was observed. Further well-designed, robust clinical studies are warranted.

Keywords: probiotics, pregnancy, postpartum, depression, prevention, psychobiotics

Infant Stress Reactivity and Select Maternal Microbes

Abiotrophia adiaeansens as a key member of the human gut microbiota in the production of GABA

GABA is shown to be an important neurotransmitter in the brain, and the balance between excitatory and inhibitory neurotransmitters is crucial for proper brain development. This study investigates the role of Abiotrophia adiaeansens in the production of GABA and its potential neurological benefits.

*Correspondence: sahila.rijan@mdpi.com

8/11/2022
**Part 4: Additional Help**

### NC MATTERS: What are our goals?

<table>
<thead>
<tr>
<th>Patients</th>
<th>Providers</th>
<th>Health Care Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Receive screening during and after pregnancy  &lt;br&gt; • Have timely access to mental health services  &lt;br&gt; • Continue care in their medical homes</td>
<td>• Increase confidence addressing perinatal mental health and substance use  &lt;br&gt; • Provide satisfactory interprofessional collaboration model</td>
<td>• Reduce unnecessary referrals &amp; missed appointments  &lt;br&gt; • Integrate care with other health conditions and SDoHs  &lt;br&gt; • Reduce immediate need for a higher level of care</td>
</tr>
</tbody>
</table>
NC MATTERS: What do we do?

- **Education**
  - Training for providers and staff
  - Screening and treatment algorithms

- **Consultation**
  - Real-time psychiatric consultation for health care professionals

- **Telepsychiatry**
  - One-time psychiatric assessments for perinatal patients at no cost

- **Resource & Referral**
  - Linkages with community-based mental health resources

Consultation Requests by Psychiatry Providers are Increasing

- **Year 1**
  - Psychiatry Providers: 4%
  - Other Callers: 96%

- **Year 2**
  - Psychiatry Providers: 12%
  - Other Callers: 88%
Mary can you adjust the key to better explain the provider vs. non-ob? The two bar graphs may be confusing

Katrina Velasquez, 2022-05-24T17:46:15.371
NC Maternal Mental Health MATTERS

We help health care providers support the behavioral health needs of their pregnant and postpartum patients.
Have a question? Call our consult line!

(919) 681-2909
ext 2

Please have on hand:
• Patient Name
• Patient DOB
• Patient Zip Code
• Patient Insurance

ncmatters.org

Thank you!

Mary_Kimmel@med.unc.edu
Karen_Burns@med.unc.edu

NCMATTERS.org
919-681-2909 x 2
Healthy Mom is Critical to Healthy Baby (and also because she deserves to be Healthy too)