

ADHD in Pregnancy & Postpartum

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General Disclosures

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Speaker Disclosures

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Learning Objectives

1. Name some risks of untreated ADHD during pregnancy
2. Recognize risks and benefits of pharmacologic options for ADHD in pregnancy
3. Describe non-pharmacologic strategies for ADHD
4. Apply a basic algorithm for how to approach ADHD in pregnancy to a case

Epidemiology

- ~3.2% prevalence of ADHD in adult women
- Use of ADHD meds in pregnancy has increased from 0.2% in 1997 to 1.3% in 2013
- Among women prescribed ADHD meds in pregnancy:
 - Amphetamine-dextroamphetamine (Adderall) = 57.5%
 - Methylphenidate (Ritalin, Concerta) = 29.9%
 - Lisdexamphetamine (Vyvanse) = 5.7%
 - Atomoxetine (Strattera) = 3.4%

Louik et al 2015

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Case

Sarah is a 28 year old woman with ADHD, depression, and anxiety who would like to get pregnant in the next year.

- Current meds: methylphenidate 30mg ER
- ADHD symptoms are well-controlled
- Depression and anxiety are in remission

What are the risks of stopping meds?

- Functional impairment
 - Poor work performance, loss of employment
 - Decreased ability to care for older children
- Comorbidities
 - Increased anxiety or depression
 - Increased risk of substance use disorders & tobacco dependence
- Safety
 - Impulsivity
 - Driving risk, accidents
- Possible pregnancy outcomes associated with untreated ADHD
 - Miscarriage, preterm birth, NICU admissions

What are non-medication options?

- Psychoeducation
- CBT for ADHD
- Coaching
- ADHD support groups
- Reduce workload if possible
- Use public transport instead of driving

What are the medication options?

- Has she had a trial period off of medication in the past? What happened?
 - If not, conduct a trial and track symptoms
- Has she failed other medications in the past?
- Is there time to trial a safer medication for pregnancy?
 - Meds can be started/stopped quickly with fast effects
- Options
 - Stimulants – increase synaptic dopamine
 - Methylphenidate (Ritalin, Metadate, Concerta), dexamethylphenidate (Focalin)
 - Amphetamine-dextroamphetamine (Adderall), dextroamphetamine (Dexedrine), lisdexamphetamine (Vyvanse)
 - Bupropion (Wellbutrin) – norepinephrine-dopamine reuptake inhibitor
 - Atomoxetine (Strattera) – norepinephrine reuptake inhibitor
 - Guanfacine, clonidine – alpha 2 adrenergic agonists

ADHD Medications in Pregnancy

	Early Pregnancy	Late pregnancy	Breastfeeding?
Methylphenidate	No consistent association with malformations (~5000 exposures); possible increased risk of spontaneous abortions	Small increased risk of preterm birth. Possible increased risk of preeclampsia, SGA, placental abruption, low Apgar score, NICU admission, CNS disorders, induced terminations	Low levels in breastmilk, undetectable in infant serum. Limited data without adverse effects
Prescribed amphetamines	No consistent association with malformations (~5500 exposures).	Small increased risk of preterm birth and preeclampsia. Possible increased risk of SGA, placental abruption, NICU admission, CNS disorders.	Infant dose up to 15% maternal dose. Very limited data without adverse effects.
Bupropion	No consistent association with malformations (~2300)	No adverse effects (small studies)	Nursing infant exposed to 2% maternal dose; 2 case reports of seizures at 6 months
Atomoxetine	No consistent association with malformations (~450 exposures)	Mixed evidence (~700 exposures)	Unknown
Guanfacine	Too few exposures to say (~30)	Low birth weight (very small studies)	Unknown
Clonidine	No based on data from women with HTN	Reduced fetal growth	Excreted in breast milk. Adverse events reported (hypotonia, drowsiness, apnea, seizure)

What are the risks of stimulants in pregnancy?

- 2005 Expert Panel of the Center for the Evaluation of Risks to Human Reproduction concluded insufficient information to comment
- More studies since 2005
 - ~9000 exposures to prescribed amphetamines
 - ~7000 exposures to prescribed methylphenidate
- Issues with these studies
 - Treatment groups have psychiatric comorbidities, take more medical and psychotropic medications, and use alcohol, tobacco, and other substances.
 - Women with more severe ADHD are more likely to remain on stimulants during pregnancy

Methylphenidate in Pregnancy

- Malformations
 - No consistent association
 - Cardiac defects? One large study* (~2000 moms) found an OR of 1.28 that was not statistically significant. If true it would increase the rate of cardiac malformations from 10 per 1000 births to 13 per 1000 births.
- Some studies show increased risk of miscarriage
- Small increased risk of preterm birth
- Mixed evidence regarding increased risk of other pregnancy outcomes (preeclampsia, NICU admissions, SGA, placental abruption, CNS-related disorders, low Apgar score, and induced terminations)
- Breastfeeding: Low levels in breastmilk, undetectable in infant serum. No adverse effects in infants but limited data. High doses may interfere with milk supply.

*Huybrechts 2017

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Prescribed Amphetamines in Pregnancy

- No consistent association with malformations
- Small increased risk of preterm birth and preeclampsia (OR ~1.3)
- Mixed evidence regarding other possible perinatal outcomes (gestational hypertension, SGA, placental abruption, NICU admissions, and CNS-related disorders)
- Breastfeeding: Infant levels as high as 15% of maternal levels. Very small number of infants without adverse effects. High doses may interfere with milk supply.

Amphetamine Abuse in Pregnancy

- No consistent association with malformations
- Increased risk of miscarriage, gestational hypertension, preeclampsia, placental abruption, preterm birth, IUGR, lower Apgar scores, fetal/neonatal/infant death
 - Proposed mechanism of action: Vasoconstriction --> Decreased uteroplacental perfusion
- Withdrawal symptoms at birth (poor feeding, sleeping disruption, abnormal muscle tone, jitteriness, breathing difficulties)
- Children have increased risk of learning difficulties, behavioral problems, externalizing disorders, anxiety, depression, structural brain changes on MRI

Tips for Prescribing Stimulants in Pregnancy

- Use the lowest dose possible
- Skip days if possible (e.g. weekends)
- Augment with non-pharmacologic strategies (CBT for ADHD, coaching)
- Monitor BP, maternal weight gain, and fetal growth

Other ADHD Meds in Pregnancy

- Bupropion
 - No consistent association with malformations (~2300 exposures)
 - Possible increased risk of miscarriage
 - Breastfeeding: low levels in breastmilk, small studies without adverse effects, but 2 case reports of 6-month old infants with seizures
- Atomoxetine
 - No consistent association with malformations (~200 exposures)
 - Mixed pregnancy outcomes
 - No data on breastfeeding
- Guanfacine
 - Very little known (~30 exposures), possible association with low birth weight
- Clonidine
 - No malformations per data from women with HTN
 - Association with reduced fetal growth
 - Excreted in breastmilk with adverse effects reported

Treatment algorithm

Mild ADHD without comorbidities	<ul style="list-style-type: none">• Discontinue medication• Optimize non-pharm strategies
Moderate ADHD with functional impairment +/- associated comorbidities	<ul style="list-style-type: none">• Assess for comorbidities• Optimize non-pharm strategies• Consider bupropion vs. prn stimulant
Severe ADHD with functional impairment + comorbidities	<ul style="list-style-type: none">• Continue stimulant at lowest effect dose (consider weekend drug holidays)• Monitor maternal BP & weight gain, monitor fetal growth• Optimize non-pharm augmentation strategies

Case Update

- 28 year old woman with ADHD, anxiety, depression on methylphenidate 30mg ER
 - Sarah's ADHD is moderate-severe. When her ADHD was previously untreated, her boss noticed decreased work performance, her depression and anxiety were much worse, and she smoked cigarettes.
 - She has previously failed a trial of bupropion
 - She is the sole breadwinner in her family.
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- Alternatively, what if Sarah's ADHD had been moderate, she was a non-smoker, she had never tried any other medications, and she worked part-time with a supportive partner and parent to help with childcare?

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Contact

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