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# What Can Our Pregnant Patients Do to Prevent Mental Illness in Their Children?

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**TCPR: Expectant mothers often want to come off psychiatric medications. From their perspective, mental illness takes place in the brain and won't affect the fetus, while psychiatric medications are quite dangerous. What can we tell them?**

**Dr. Freedman:** There are risks with psychiatric medications, but the only one that is contraindicated in pregnancy is valproate (Depakote), which has been linked to neural tube deficits and lower IQ. On the other hand, untreated mental illness also affects the developing baby, and this risk isn't limited to postpartum disorders. During pregnancy, untreated depression significantly increases the risk that the infant will fail to develop adequate levels of cerebral inhibition. That's a measure of the infant's ability to filter out irrelevant stimuli, and it's the first sign that development is not on an optimal track (Hunter SK et al, *Schizophr Bull* 2011;37(6):1200–1208).

**TCPR: How do we know that problem is caused by prenatal depression, rather than depressive symptoms that continue after childbirth?**

**Dr. Freedman:** The reason we study cerebral inhibition is that it can be measured very early—1 month after birth—and that helps separate out the effects of depression during pregnancy from the psychosocial consequences of living with a depressed mother. When depression is treated during pregnancy, even with antidepressants, we don't see this problem in development. So as best we can tell, it's depression during pregnancy that's causing it.

**TCPR: What else can expectant mothers do to prevent psychiatric problems in the developing baby?**

**Dr. Freedman:** Avoid drugs, including nicotine and marijuana. Good nutrition. Also flu shots, be-

cause infections are one of the leading risk factors for schizophrenia (Brown AS et al, *Am J Psychiatry* 2010;167(3):261–280). The shot comes as an inactivated virus formulated for pregnancy. And, of course, prenatal vitamins. Most of these have folate and vitamins A and D, which are critical to brain development and help prevent schizophrenia, but one nutrient they often miss is choline. In 2017, the American Medical Association (AMA) recommended adding choline.

**TCPR: How did the AMA come to that decision?**

**Dr. Freedman:** Choline has been studied in pregnancy for over a decade. It improves the infant’s cognitive ability and has no side effects at the doses studied. Choline is an agonist at the alpha-7 nicotinic receptors, which are implicated in the development of schizophrenia. Our group has found that choline supplementation during pregnancy prevents early signs of future schizophrenia and other disorders, such as social isolation and attention problems, at 3.5 years of age. Another group has now found that choline supplements prevent early cognitive deficits in children of mothers who drink alcohol in pregnancy.

**TCPR: Tell us more about what you found.**

**Dr. Freedman:** With the FDA’s approval, we conducted a randomized clinical trial of choline supplementation in 100 pregnant women. So far we’ve followed the children up to age 4, and the choline group has less social isolation and better attention. Those two areas tend to be abnormal in people at that age who later develop schizophrenia, but we don’t know what will happen in 20 years (Ross RG et al, *Am J Psychiatry* 2013;170(3):290–298).

**TCPR: Are the data good enough to start using choline clinically?**

**Dr. Freedman:** I can’t say. On the one hand, a fetus has only one chance at brain development, and deficits occurring in fetal life are not reversed after birth. For example, folic acid before birth prevents spina bifida. After birth, folic acid will not close the spine that failed to close during fetal development. So it’s very important for people to be aware of choline. On the other hand, the evidence is still coming in. Other groups have found similar results, with improvements in cognition and behavior at ages 1 to 4 years.

**TCPR: Are prenatal vitamins starting to add choline?**

**Dr. Freedman:** Most popular brands, like One-A-Day Prenatal, do not. A few vitamin brands have it, but in very small doses like 10–50 mg. The FDA’s recommendation for dietary choline is 550 mg daily, but the average Western diet only yields about 300 mg of choline. So most women—about two-thirds—are choline-deficient. (Editor’s note: Dr. Freedman has no financial or other interest in choline products.)

**TCPR: How would you supplement choline in pregnancy?**

**Dr. Freedman:** We actually use a precursor, phosphatidylcholine (PIP), and the dose we use in pregnancy is 6,300 mg daily. That converts to 900 mg of choline. PIP is the main dietary source of choline, and there are no known risks with PIP (eg, Country Life Phosphatidylcholine, 600 mg capsules, dose = 10 capsules/day, \$375/pregnancy). The pure form, choline bitartrate, is cheaper, but it

can sometimes form a bolus in the large intestine, where bacteria metabolize it into a foul-smelling and sometimes toxic product (eg, Nature's Way Choline Bitartrate, 500 mg capsules = 204 mg choline, dose = 5 capsules/day, \$98/pregnancy).

**TCPR: When is the optimal time to supplement?**

**Dr. Freedman:** Earlier is better. A woman could start while trying to become pregnant. If she does start early, she should understand that spontaneous abortions are common and not something that's caused by supplementation.

**TCPR: Can a woman get choline from diet alone?**

**Dr. Freedman:** Yes, but it's not easy. It would take a serving of calf's liver every day, or 6 hard-boiled eggs a day, or 1–2 servings of steak a day.

**TCPR: Thank you for your time, Dr. Freedman.**

*Editor's note: Dr. Freedman maintains an educational site for patients at [www.prenataldoctoradvice.com](http://www.prenataldoctoradvice.com) (<http://www.prenataldoctoradvice.com>).*

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