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Review Article

EMERGING PERSPECTIVES OF RISK AND MEDICATION IN PREGNANCY

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ABSTRACT

Pregnancy is an exciting time in a woman's life. Changes in your body may be matched by changes in your emotions. During pregnancy, some medications are safe and some are not. Some require a higher than usual dose, and some doses change with the advancing pregnancy. Physicians responsible for providing care to pregnant women are aware of these different medications and their restrictions. A mother taking illegal drugs during pregnancy increases her risk for anaemia, blood and heart infections, skin infections, hepatitis, and other infectious diseases. A woman's drug use can affect both her foetus and her newborn. Most drugs cross the placenta--the organ that provides nourishment to the foetus. Some can cause direct toxic (poisonous) effects and drug dependency in the foetus. After birth, some drugs can be passed to the baby through breast-feeding. More than 90% of pregnant women take prescription or nonprescription (over-the-counter) drugs or use social drugs (such as tobacco and alcohol) or illicit drugs at some time during pregnancy. Cocaine use can lead to premature delivery of the foetus, premature detachment of the placenta, high blood pressure, and stillbirth. The critical period of embryonic development, when the major organ systems develop, starts at about 17 days post-conception and is complete by 60 to 70 days**.** In general, drugs, unless absolutely necessary,

should not be used during pregnancy because many can harm the fetus. About 2 to 3% of all birth defects result from the use of drugs other than alcohol.

Keywords: Pregnancy, drugs, risk, migraine

INTRODUCTION

Drugs can cause problems throughout your pregnancy. For example, the early part of pregnancy is the most critical for the health of a foetus. This is when the main body systems are forming. Using drugs during this time can cause severe damage. Drugs can have harmful effects on the foetus at any time during the pregnancy, their nature depending on the timing of exposure. During the first two weeks of development, the embryo is thought to be resistant to any teratogenic effects of drugs. While some medications are considered safe to take during pregnancy, the effects of other medications on your unborn baby are unknown. Therefore, it is very important to pay special attention to medications you take while you are pregnant, especially during the first trimester, a crucial time of development for your baby. If you were taking prescription medications before you became pregnant, please ask your health care provider about the safety of continuing these medications as soon as you find out that you are pregnant. Your health care provider will weigh the benefit to you and the risk to your baby when making his or her recommendation about a particular medication. With some medications, the risk of *not* taking them may be more serious than the potential risk associated with taking them. Heroin, cocaine, and other addictive drugs are not necessarily deforming substances, but use can cause withdrawal in the newborn as well as growth retardation in the unborn baby. Alcohol abuse can cause what's called Fetal-Alcohol Syndrome, associated with deformed teeth and facial features and mental retardation. Marijuana, like cigarettes, has many chemicals in it besides THC. If you get stoned, your baby gets stoned--all at a time when neural cells are busy developing so that they can handle all of the neurotransmitters used in proper central nervous system functioning. A laboratory test, called a

chromatography, performed on a woman's urine can detect many illegal drugs, including marijuana and cocaine. Marijuana and cocaine, as well as other illegal drugs, can cross the placenta. Marijuana use during pregnancy may be linked to behavioural problems in the baby. Exposure to certain drugs during this period (17 to 70 days) can cause major birth defects. However, some drugs can interfere with functional development of organ systems and the central nervous system in the second and third trimesters and produce serious consequences. During the last 12 weeks of pregnancy, drug use poses the greatest risk for stunting fetal growth and causing pre-term birth. Maternal drug use during pregnancy may pose a teratogenic risk for the embryo. However, the recommendation to avoid all drugs during early pregnancy is unrealistic and may be dangerous. About 8% of pregnant women need permanent drug treatment due to their chronic diseases such as epilepsy, diabetes mellitus, bronchial asthma, hypertension, thyroid disorders, migraine, and severe depression. More pregnant women require transient drug treatment because of influenza, acute infectious diseases of respiratory system and urogenital organs, the latter mainly due to sexually transmitted infections. In addition, headache, nervousness, constipation and other common complaints may also need drug treatments. Finally there are many pregnancy complications such as nausea and vomiting, threatened abortion, preterm delivery, toxemia and anemia which may also require drug treatments.

DRUG RISK CLASSIFICATION IN PREGNANCY

The FDA has a categorization of drug risk to the fetus that runs from "Category A" (safest) to "X" (known danger--don't use!): Controlled studies in women fail to demonstrate a risk to the fetus in the first trimester (and there is no evidence of a risk in later trimesters), and the possibility of fetal harm appears remote.

Category B

Either animal-reproduction studies have not demonstrated a fetal risk but there are no controlled studies in pregnant women, or animal-reproduction studies have shown an adverse effect (other than a decrease in fertility) that was not confirmed in controlled studies in women in the first trimester (and there is no evidence of a risk in later trimesters).

Category C

Either studies in animals have revealed adverse effects on the fetus (teratogenic or embryocidal or other) and there are no controlled studies in women, or studies in women and animals are not available. Drugs should be given only if the potential benefit justifies the potential risk to the fetus.

Category D

There is positive evidence of human fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk (e.g., if the drug is needed in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective).

Category X

Studies in animals or human beings have demonstrated fetal abnormalities, or there is evidence of fetal risk based on human experience or both, and the risk of the use of the drug in pregnant women clearly outweighs any possible benefit. The drug is contraindicated in women who are or may become pregnant.

Prescription Medicines

The FDA chooses a medicine's letter category based on what is known about the medicine when used in pregnant women and animals.

Table-1

Definition of Medicine Catogories		
Pregnancy Category	**Definition**	**Examples of Drugs**
A	In human studies, pregnant women used the medicine and their babies did not have any problems related to using the medicine.	• Folic acid • Levothyroxine (thyroid hormone medicine)
B	In humans, there are no good studies. But in animal studies, pregnant animals received the medicine, and the babies did not show any problems related to the medicine. ***Or*** In animal studies, pregnant animals received the medicine, and some babies had problems. But in human studies, pregnant women used the medicine and their babies did not have any problems related to using the medicine.	• Some antibiotics like amoxicillin. • Zofran (ondansetron) for nausea • Glucophage (metformin) for diabetes • Some insulins used to treat diabetes such as regular and NPH insulin.
C	In humans, there are no good studies. In animals, pregnant animals treated with the medicine had some babies with problems. However, sometimes the medicine may still help the human mothers and babies more than it might harm. ***Or*** No animal studies have been done, and there are no good studies in pregnant women.	• Diflucan (fluconazole) for yeast infections • Ventolin (albuterol) for asthma • Zoloft (sertraline) and Prozac (fluoxetine) for depression

Definition of Medicine Catogories		
Pregnancy Category	**Definition**	**Examples of Drugs**
D	Studies in humans and other reports show that when pregnant women use the medicine, some babies are born with problems related to the medicine. However, in some serious situations, the medicine may still help the mother and the baby more than it might harm.	• Paxil (paroxetine) for depression • Lithium for bipolar disorder • Dilantin (phenytoin) for epileptic seizures • Some cancer chemotherapy
X	Studies or reports in humans or animals show that mothers using the medicine during pregnancy may have babies with problems related to the medicine. There are no situations where the medicine can help the mother or baby enough to make the risk of problems worth it. These medicines should never be used by pregnant women.	• Accutane (isotretinoin) for cystic acne • Thalomid (thalidomide) for a type of skin disease

MANAGING ALLERGIES DURING PREGNANCY

Rhinitis during pregnancy can be due to allergic rhinitis, sinusitis, or non-allergic rhinitis. If the woman has had allergic rhinitis prior to pregnancy, this could worsen, stay the same, or even improve. This change in symptoms may be dependent upon many factors, including the presence of seasonal allergens and increase in pregnancy hormones. Non-allergic rhinitis in pregnancy may also be due to an increase in pregnancy hormones, leading to nasal congestion, runny nose and post nasal drip. This is called “rhinitis of pregnancy”. The symptoms may mimic allergies, but since they are non-allergic in nature, do not respond to anti-histamines. The pregnant woman with rhinitis may be concerned about the safety of medications during pregnancy, and therefore avoid taking medications. If avoidance of allergic triggers is not possible or successful, medications may be needed to control symptoms.

Diagnosis of Allergic Rhinitis During Pregnancy

Allergy testing includes skin testing or blood tests, called a Rast. In general, allergy skin testing is not done during pregnancy, given the small chance of anaphylaxis which may occur. Anaphylaxis during pregnancy, if severe, could result in a decrease in blood and oxygen to the uterus, possibly harming the fetus. Therefore, allergy testing is usually deferred during pregnancy, although a RAST would be a safe alternative if the results are needed during pregnancy.

Safety of Allergy Medications During Pregnancy

According to the Food and Drug Administration (FDA), no drugs are considered completely safe in pregnancy. This is because no pregnant woman would want to sign up for a medication safety study while she is pregnant. Therefore, the FDA has assigned risk categories to medications based on use in pregnancy. Pregnancy category "A" medications are medications in which there are good studies in pregnant women showing the safety of the medication to the baby in the first trimester. There are very few medications in this category, and no asthma medications. Category "B"medications show good safety studies in pregnant animals but there are no human studies available. Pregnancy category "C" medications may result in adverse effects on the fetus when studied in pregnant animals, but the benefits of these drugs may out weight the potential risks in humans. Category "D" medications show clear risk to the fetus, but there may be instances in which the benefits outweigh the risks in humans. And finally, category "X" medications show clear evidence of birth defects in animals and/or human studies and should not be used in pregnancy. Before any medication is taken during pregnancy, the doctor and patient must have a risk/benefit discussion. This means that the benefits of the medication should be weighed against the risks – and the medication should only be taken if the benefits outweigh the risks.

Treatment of Rhinitis during Pregnancy

Nasal saline

Rhinitis of pregnancy tends not to respond to anti-histamines or nasal sprays. This condition seems to respond temporarily to nasal saline (salt water), which is safe to use during pregnancy (it is not actually a drug). Nasal saline is available over the counter, is inexpensive, and can be used as often as needed. Generally 3 to 6 sprays are placed in each nostril, leaving the saline in the nose for up to 30 seconds, and then blowing the nose.

Anti-histamines

Older anti-histamines, such as chlorpheniramine and tripelennamine, are the preferred agents to treat allergic rhinitis during pregnancy, and are both category B medications. Newer anti-histamines such as over-the-counter loratadine (Claritin®/Alavert® and generic forms) and prescription cetirizine (Zyrtec®) are also pregnancy category B medications.

Decongestants

Pseudoephedrine (Sudafed®, many generic forms) is the preferred oral decongestant to treat allergic and non-allergic rhinitis during pregnancy, although should be avoided during the entire first trimester, as it has been associated with infantgastroschisis. This medication is pregnancy category C.

Medicated nasal sprays

Cromolyn nasal spray (NasalCrom®, generics) is helpful in treating allergic rhinitis if it is used before exposure to an allergen and prior to the onset of symptoms. This medication is pregnancy category B and is available over the counter. If this medication is not helpful, one nasal steroid, budesonide (Rhinocort Aqua®), recently received a pregnancy category B rating (all others are category C), and therefore would be the nasal steroid of choice during pregnancy.

Immunotherapy

Allergy shots can be continued during pregnancy, but it is not recommended to start this treatment while pregnant. Typically the dose of the allergy shots is not increased, and many allergists will cut the dose of the allergy shot by 50 percent during pregnancy. Some allergists feel that allergy shots should be stopped during pregnancy, given the risk of anaphylaxis and possible danger to the fetus as a result. Other than anaphylaxis, there is no data showing that the allergy shots themselves are actually harmful to the fetus.

Over-the-Counter Medications During Pregnancy

Pregnancy can be wrought with physical discomforts, ranging from nausea to heartburn to swollen ankles and more. Add everyday nuisances, such as headaches or cold and allergy symptoms, and pregnant women can feel they're serving a 9-month sentence with no chance of relief. However, a variety of over-the-counter (OTC) medications have been deemed safe during pregnancy, offering potential respite from at least some bothersome symptoms. Pregnant women have taken notice. According to the American Academy of Family Physicians (AAFP), more than 92% of women indicated in one study that they self-treat with OTC drugs while pregnant.

Although these drugs are readily available without a prescription, pregnant women should always check with their doctor before taking any medication, whether OTC or prescription. Complete information on the safe use of medications during pregnancy is necessarily narrowed by the ethical considerations of testing on pregnant women. (Some drugs are tested on pregnant animals instead.)Which OTC medications are considered safe? Which should be avoided? Much depends on the type of drug and for what it's being used, and also which stage of pregnancy a woman is in. Of the four main types of OTC drugs -- pain relievers, decongestants, antihistamines and cough medicines -- each includes ingredients that are either harmless to a developing baby or could possibly result in birth defects or complications during labor and delivery. Therefore, typically the active ingredients of a

drug are provided on the label -- indicating how it is to be used, who should use it, how much should be taken and how often -- to be read, which is paramount to safety.

PAIN RELIEVERS DURING PREGNANCY

Acetaminophen, the active ingredient in Tylenol, is widely considered safe during pregnancy. Used primarily for headaches, fever reduction, sore throat, and aches and pains, it can be used during all three trimesters.

Aspirin, whose active ingredient is salicylic acid, should not be taken by pregnant women unless otherwise recommended by a doctor (low doses are sometimes prescribed for some pregnant women with special medical conditions). Its blood-thinning properties (the reason many patients with heart disease take it) can cause problems in the fetus, and if it is taken in the day or so before delivery, aspirin can lead to heavy bleeding by both mother and baby.Nonsteroidal anti-inflammatory drugs, better known as NSAIDs, comprise aspirin as well as Advil or Motrin (ibuprofen) and Aleve (naproxen). Ibuprofen and naproxen should be used with caution during pregnancy. They are believed to be safe in the first two trimesters, but pregnant women are ill-advised to use these medications in the third trimester because they can increase bleeding during childbirth as well as cause changes in the fetal circulation.

Decongestants

Used to ease symptoms of colds or allergies, decongestants such as Sudafed and AllerMed contain pseudoephedrine and are deemed safe during pregnancy, although some studies suggest an increased risk of a certain type of hernia occurring in babies when this is used during the first trimester.

Antihistamines

Two active ingredients comprise most OTC antihistamines, including Chlor-Trimeton or Aller-Chlor (chlorpheniramine) and Benadryl or Diphenhist (diphenhydramine). Chlorpheramine and

diphenhydramine are both routinely used by pregnant women; the AAFP prefers chlorpheramine, as there is a risk that diphenhydramine can cause uterine contractions if taken in high doses. Antihistamines work against a variety of allergy and cold symptoms, including itching, sneezing and mucus production.

Cough Medicines

OTC cough remedies, such as Robitussin or Drixoral, typically contain either dextromethorphan, which is more effective for dry coughs, or guaifenesin, which works on moist, productive coughs.Although both active ingredients are classified as safe during pregnancy, the AAFP states that guaifenesin is linked to the development of neural tube defects in the fetus, such asspina bifida. The AAFP advises pregnant women to use the alternative, dextromethorphan, in moderation if at all, because its effectiveness is uncertain.

RISKS OF DRUG USE DURING PREGNANCY

The specific risks of drug use depend on a number of factors including the type of drug used, at what point during pregnancy the drug was used, and the frequency of drug use.

In general, drugs cause miscarriage, stillbirth, small size, low birth weight,premature birth, birth defects, sudden infant death syndrome (SIDS), and drug-dependency in the infant. Some of the specific risks of drug use during pregnancy are:

- Low birth weight places babies at increased risk for illness, disability, and death. Low birth weight infants are at risk for mental retardation, learning disability, and long-term consequences.
- Premature birth increases the risk of lung, eye, and learning problems in the infant. In addition, preterm babies are at increased risk for infection and death.

- Drug use increases the risk of medical problems and birth defects, including stroke, seizure, mental retardation, and learning disabilities.
- Fetuses can become dependent on the drug(s) the pregnant mother is using and may experience withdrawal symptoms after delivery.

Drug use early during pregnancy can affect the developing organs and limbs of the fetus. Even one episode of drug use during this period can affect the development of your child. Often the result is a birth defect or miscarriage. Drug use later in pregnancy can affect development of your baby's central nervous system. After pregnancy, many drugs can pass through breast milk and can harm the baby.

Marijuana

Some studies have reported that marijuana can increase the chances that your baby will have a bowel movement while inside the womb (this can cause early onset of labor and fetal distress). Other studies have noted poor growth of babies, risk for childhood leukemia, and neurobehavioral problems such as tremor, irritability, and a shrill, high-pitched cry.Three to 16% of women reportedly use marijuana during pregnancy.The main psychoactive ingredient of marijuana, THC, is excreted in breast milk. The of Pediatrics recommends that marijuana not be used during the time a woman is breast-feeding.

Alcohol

Alcohol is one of the most dangerous drugs for pregnant women, especially in the early weeks. In the mother’s body, alcohol breaks down chemically to a cell-damaging compound that is readily absorbed by the fetus. Heavy drinking during early pregnancy greatly increases the risk of a cluster of birth defects known as fetal alcohol syndrome. This cluster includes a small skull (microcephaly), abnormal facial features, and heart defects, often accompanied by impeded growth and mental retardation. Heavy drinking in later pregnancy may also impede growth.It is not known whether light to moderate drinking can produce these effects. However, even if the risk is low, the stakes are very high. Medical

experts agree that a woman should avoid alcohol entirely when she decides to become pregnant, or at least when the first signs of pregnancy appear. Even such mild beverages as beer and wine coolers should be off limits.

Tobacco

Smoking during pregnancy appears to raise the risk of miscarriage or premature labor. But the primary danger is hindered fetal growth. Nicotine depresses the appetite at a time when a woman should be gaining weight, and smoking reduces the ability of the lungs to absorb oxygen. The fetus, deprived of sufficient nourishment and oxygen, may not grow as fast or as much as it should.

Cocaine & Methamphetamine

Cocaine (including crack) and methamphetamine (speed, or ice) are powerful stimulants of the central nervous system. They suppress the mother's appetite and exert other drastic forces on her body, causing the blood vessels to constrict, the heart to beat faster, and the blood pressure to soar. The growth of the fetus may be hindered, and there are higher risks of miscarriage, premature labor, and a condition called abruptio placentae (the partial separation of the placenta from the uterus wall, causing bleeding).If these drugs are taken late in pregnancy, the baby may be born drug dependent and suffer withdrawal symptoms, such as tremors, sleeplessness, muscle spasms, and sucking difficulties. Some experts believe learning difficulties may later develop.

Heroin & Other Narcotics

Heavy narcotics use increases the danger of premature birth with such accompanying problems for the infant as low birthweight, breathing difficulties, low blood sugar (hypoglycemia), and bleeding within the head (intracranial hemorrhage).The babies of narcotics-dependent mothers are often born dependent themselves and suffer withdrawal symptoms, such as irritability, vomiting and diarrhea, and joint stiffness.Women who inject narcotics may become infected with the HIV virus from dirty

needles and may subsequently develop AIDS. HIV-infected women obviously run a high risk of passing the virus on to their babies.

Inhalants

At least one inhaled substance has been clearly connected with birth defects. The organic solvent toluene, widely used in paints and glues, appears to cause malformations like those produced by alcohol (which is itself an organic solvent). It is possible that all organic solvents may cause birth defects.

PCP

PCP (phencyclidine, or angel dust) taken late in pregnancy can cause newborns to have withdrawal symptoms, such as lethargy alternating with tremors.

Table-2 Avoided Or Used With Caution In Pregnancy

First trimester	
Drug	**Comment and advice**
Acetazolamide	Avoid
Albendazole	Avoid in nematode infection
Alcohol	Regular daily drinking is teratogenic and may cause growth retardation; occasional single drinks are probably safe
Amitriptyline	Avoid unless essential
Artemether	Avoid
Artesunate	Avoid
Benznidazole	Avoid
Carbamazepine	Risk of teratogenesis including increased risk of neural tube defects; risk of teratogenicity greater if more than one antiepileptic used.
Chloroquine	Benefit of prdphylaxis and treatment in malaria out weighs risk

Ciprofloxacin	Avoid arthropathy in animal studies; safer alternative available
Clomipramine	Manufacturer advises avoid unless essential
Didanosine	Avoid if possible
Diloxanide	Defer treatment until first trimester
Doxycycline	Effect on skeletal development in animal studies
Efavirenz	Avoid
Eflornithine	Avoid
Enalapril	Avoid; may adversely affect fetal and neonatal blood pressure control and renal function; also possible skull defects and oligohydramnios; toxicity in animal studies
Ergotamine	Oxytocic effect on the pregnant uterus
Ethosuximide	May possible be teratogenic; risk of teratogenicity greater if more than one antiepileptic used
Heparin	Osteoporosis has been reported after prolonged use; multidose vials may contain benzyl alcohol avoid
Hydralazine	Avoid
Indinavir	Avoid if possible
Insulin	Insulin requirement should be assessed frequently by an experienced diabetic clinic
Lithium	Avoid if possible
Lopinavir + ritonavir	Avoid
Mebendazole	Avoid in nematode infection
Malarsoprol	Avoid
Metformin	Avoid; insulin is normally substituted in all diabetics
Nalidixic acid	Avoid arthropathy in animal studies; safer alternatives available
Nelfinavir	Avoid
Nevirapine	Avoid

Nifurtimox	Avoid
Ofloxacin	Avoid arthropathy; safer alternatives available
Penicillamine	Fetal abnormalities reported rarely; avoid if possible
Phenobarbital	Congenital malformations; risk of teratogenicity greater if more than one antiepileptic used. May possibly cause vitamin A deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding
Phenytoin	Congenital malformations; adequate folate supplements should be given to mother; risk of teratogenicity greater if more than one antiepileptic used. May possibly cause vitamin A deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding. Caution in interpreting plasma concentrations bound may be reduced but free unchanged
Podophyllum resin	Avoid neonatal death and teratogenis have been reported
Pyrimethamine	Theoretical teratogenic risk; adequate fetal supplements should be given to the mother.
Quinin	High dose are teratogenic; but in malaria benefit of treatment out weighs risk
Retinal	Excessive dose may be teratogenic
Rifampicin	Very high doses teratogenic in animal studies
Stavudine	Avoid
Streptokinase	Possibility of premature separation of placenta in first 18 weeks; theoretical possibility of fetal hemorrhage throughout pregnancy; risk of maternal hemorrhage on postpartum use
Sulfadiazine	Avoid
Sulfamethoxazole + trimethoprim	Teratogenic risk
Testosterone	Masculinization of female fetus; avoid
Tetracycline	Effect on skeletal development in animal studies
Trimethoprim	Teratogenic risk
Vaccine, BCG	Theoretical risk of congenital malformations, but need for vaccination may outweigh possible risk to fetus

	may out weigh possible risk to fetus
Vaccine, Measles	Theoretical risk of congenital malformations, but need for vaccination may out weigh possible risk to fetus-avoid MMR
Vaccine, poliomyelitis, live	Theoretical risk of congenital malformations, but need for vaccination may out weigh possible risk to fetus
Vaccine, yellow fever	Theoretical risk of congenital malformations, but need for vaccination may out weigh possible risk to fetus
Valproic acid	Increased risk of neural tube defects; risk of teratogenicity greater if more than one antiepileptic used; neonatal bleeding and neonatal hepatotoxicity also reported
Warfarin	Congenital malformations; fetal and neonatal hemorrhage
Zidovudine	Avoid
Lamivudine	Avoid if possible
Second trimester	
Alcohol	Regular daily drinking is teratogenic and may cause growth retardation; occasional single drinks are probably safe
Ciprofloxacin	Avoid arthropathy in animal studies; safer alternative available
Doxycycline	Dental discoloration; maternal hepatootxicity with large doses
Efavirenz	Avoid
Enalapril	Avoid; may adversely affect fetal and neonatal blood pressure control and renal function; also possible skull defects and oligohydramnios; toxicity in animal studies
Ergotamine	Oxytocic effect on the pregnant uterus
Gentamicin	Auditory or vestibular nerve damage; risk probably very small with gentamicin, but avoid unless essential
Heparin	Osteoporosis has been reported after prolonged use; multidose vials may contain benzyl alcohol avoid
Hydralazine	Avoid
Insulin	Insulin requirement should be assessed frequently by an experienced diabetic clinic

Iodine	Neonatal goiter and hypothyroidism
Eflornithine	Avoid
Lithium	Dose requirements increased; close monitoring of serum-lithium concentration advised
Malarsoprol	Avoid
Metformin	Avoid; insulin is normally substituted in all diabetics
Nalidixic acid	Avoid arthropathy in animal studies; safer alternatives available
Ofloxacin	Avoid arthropathy; safer alternatives available
Penicillamine	Fetal abnormalities reported rarely; avoid if possible
Podophyllum resin	Avoid neonatal death and teratogenis have been reported
Polyvidoneiodine	Sufficient iodine may be absorbed to affect the fetal thyroid
Potassium iodide	Neonatal goiter and hypothyroidism- Avoid
Propylthiouracil	Neonatal goiter and hypothyroidism- Avoid
Streptokinase	Possibility of premature separation of placenta in first 18 weeks; theoretical possibility of fetal hemorrhage throughout pregnancy; risk of maternal hemorrhage on postpartum use
Streptomycin	Auditory or vestibular damage; avoid unless essential
Testosterone	Masculinization of female fetus; avoid
Tetracycline	Dental discoloration; maternal hepatotoxicity with large doses
Warfarin	Congenital malformations; fetal and neonatal hemorrhage
Lamivudine	Benefit of treatment considered to outweighs risk
Third trimester	
Alcohol	Withdrawal may occur in babies of alcoholic mother
Aminophylline	Neonatal irritability and apnoea have been reported
Amitriptyline	Avoid unless essential
Bupivacaine	With large doses; neonatal respiratory depression, hypotonia, and bradycardia after paracervical or epidural block

	bradicardia after paracevical or epidural block
Chloramethine	Neonatal 'gray' syndrome
Carbamazepine	May possibly cause vitamin K deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding
Chloroquine	Important
Chlorpromazine	Extrapyramidal effects in neonatal occasionally reported
Ciprofloxacin	Avoid arthropathy in animal studies; safer alternative available
Clomipramine	Manufacturer advises avoid unless essential
Codeine	Depresses neonatal respiration; withdrawal effects in neonates of dependent mothers; gastric stasis and risk of inhalation pneumonia in mother during labour
Dapsone	Neonatal haemolysis and methaemoglobinaemia; folic acid 5mg daily should be given to mother
Doxycycline	Dental discoloration; maternal hepatootxicity with large doses
Efavirenz	Avoid
Eflornithine	Avoid
Enalapril	Avoid; may adversely affect fetal and neonatal blood pressure control and renal function; also possible skull defects and oligohydramnios; toxicity in animal studies
Ergotamine	Oxytocic effect on the pregnant uterus
Ether, anaesthetic	Depression neonatal respiration
Fluphenazine	Extrapyramidal effects in neonatal occasionally reported
Gentamicin	Auditory or vestibular nerve damage; risk probably very small with gentamicin, but avoid unless essential
Glibenclamide	Neonatal hypoglycaemia; insulin is normally substituted in all diabetics; if oral drugs are used therapy should be stopped at least 2days before delivery
Haloperidol	Extrapyramidal effects in neonate occasionally reported

Halothane	Depresses neonatal respiration
Heparin	Osteoporosis has been reported after prolonged use; multidose vials may contain benzyl alcohol avoid
Hydralazine	No reports of serious harm
Hydrochlorothiazine	May cause neonatal thrombocytopenia
Ibuprofen	With regular use closure of fetal ductus arteriosus in utero and possibly persistent pulmonary hypertension of the newborn. Delayed onset and increased duration of labour
Insulin	Insulin requirement should be assessed frequently by an experienced diabetic clinic
Iodine	Neonatal goiter and hypothyroidism
Ketamine	Depresses neonatal respiration
Levamisole	Avoid
Lamivudine	Benefit of treatment considered to outweighs risk
Lidocaine	With large doses, neonatal respiratory depression, hypotonia, and bradicardia after paracervical or epidural block
Lithium	Dose requirements increased; close monitoring of serum-lithium concentration advised
Magnesium sulfate	Not known to be harmful but observe caution for short-term intravenous administration in eclampsia but excessive doses may cause neonatal respiratory depression
Malarsoprol	Avoid
Metformin	Avoid; insulin is normally substituted in all diabetics
Morphine	Depresses neonatal respiration; withdrawal effects in neonates of dependent mothers; gastric stasis and risk of inhalation pneumonia in mother during labour
Nalidixic acid	Avoid arthropathy in animal studies; safer alternatives available
Neostigmine	Neonatal myasthenia with large doses
Nitrofurantoin	May produce neonatal haemolysis if used at term

Nitrous oxide	Depresses neonatal respiration
Ofloxacin	Avoid arthropathy; safer alternatives available
Penicillamine	Fetal abnormalities reported rarely; avoid if possible
Phenytoin	Congenital malformations; adequate folate supplements should be given to mother; risk of teratogenicity greater if more than one antiepileptic used. May possibly cause vitamin A deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding. Caution in interpreting plasma concentrations bound may be reduced but free unchanged
Phenobarbital	Congenital malformations; risk of teratogenicity greater if more than one antiepileptic used. May possibly cause vitamin A deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding
Podophyllum resin	Avoid neonatal death and teratogenis have been reported
Polyvidoneiodine	Sufficient iodine may be absorbed to affect the fetal thyroid
Potassium iodide	Neonatal goiter and hypothyroidism- Avoid
Primaquine	Neonatal haemolysis and methaemoglobinaemia. Delay treatment until after delivery
Propylthiouracil	Neonatal goiter and hypothyroidism- Avoid
Pyridostigmine	Neonatal myasthenia with large doses
Salbutamol	For use in premature labour
Rifampicin	Risk of neonatal bleeding may be increased
Silver sulfadiazine	Neonatal haemolysis and methaemoglobinaemia; fear of increased risk of kernicterus in neonates appears to be unfounded
Streptokinase	Possibility of premature separation of placenta in first 18 weeks; theoretical possibility of fetal hemorrhage throughout pregnancy; risk of maternal hemorrhage on postpartum use
Streptomycin	Auditory or vestibular damage; avoid unless essential
Sulfadiazine	Neonatal haemolysis and methaemoglobinaemia; fear of increased risk of kernicterus in neonates appears to be unfounded in toxoplasmosis
Sulfasalazine	Theoretical risk of haemolysasis; adequate fotal supplements should be given to mother

	given to mother
Sulfadoxine + Pyrimethamine	Neonatal haemolysis and methaemoglobinaemia; fear of increased risk of kernicterus in neonates appears to be unfounded
Sulfamethoxazole + Trimethoprim	Neonatal haemolysis and methaemoglobinaemia; fear of increased risk of kernicterus in neonates appears to be unfounded
Testosterone	Masculinization of female fetus; avoid
Tetracycline	Dental discoloration; maternal hepatotoxicity with large doses
Theophylline	Neonatal irritability and apnoea have been reported
Thiopental	Depresses neonatal respiration
Valproic acid	Increased risk of neural tube defects; risk of teratogenicity greater if more than one antiepileptic used; neonatal bleeding and neonatal hepatotoxicity also reported
Warfarin	Congenital malformations; fetal and neonatal hemorrhage
Miscellaneous	
Abacavir	Toxicity in animal studies
Acetylsalicylic acid	Impaired platelet function and risk of hemorrhage; delayed onset and increased duration of labour with increased blood loss; avoid analgesic drugs if possible in last few weeks; with high doses, closure of fetal ductus arteriosus in utero and possibly persistent pulmonary hypertension of newborn; kernicterus in jaundiced neonate
Aciclovir	Not known to be harmful but observe caution; limited absorption from topical preparation
Albendazole	Contraindicated in cestode infections
Alcuronium	Does not cross placenta in significant amounts; use only if potential benefit out weighs risk
Allopurinol	Toxicity not reported; use only if no safer alternatives and diseases carried risk for mother or child
Amiloride	Nit used to treat hypertension in pregnancy
Amodiaquine	Use only if no safer alternative
Amoxicillin	Not known to be harmful but observe caution

Amoxicillin + Clavulanic acid	Not known to be harmful but observe caution
Amphotericin B	Not known to be harmful but observe caution but use only if potential benefit out weighs risk
Artemather + Lumefantrin	Avoid. Toxicity in animal studies with artemether
Asparaginase	Avoid
Atenolol	May cause intrauterine growth restriction, neonatal hypoglycaemia, and bradycardia; risk greater in sever hypertension
Atropine	Not known to be harmful but observe caution
Azathioprine	Transplant patient should be discontinue azathioprine on becoming pregnant; use in pregnancy should be supervised in specialist units; there is no evidence that azathioprine is teratogenic
Azithromycin	Use only if potential benefit out weighs risk
Beclometasone	Benefit of treatment, for example in asthma, out weighs risk
Benzathine benzylpenicillin	Not known to be harmful but observe caution
Benzylpenicillin	Not known to be harmful but observe caution
Betamethasone	Benefit of treatment, for example in asthma, out weighs risk
Bleomycin	Avoid
Calcium folinate	Use only if potential benefit out weighs risk
Ceftazidime	Not known to be harmful but observe caution
Chlirmethine	Avoid
Ceftriaxone	Not known to be harmful but observe caution
Chlorambucil	Avoid; use effective contraception during administration to men or women
Chlorphenamine	No evidence of teratogenicity
Ciclosporin	There is less experience of ciclosporin in pregnancy but it does not appear to be any more harmful than azathioprine; use in pregnancy should be supervised in specialist units

Cisplatin	Avoid
Clindamycin	Not known to be harmful but observe caution
Clomifene	Possible effects on fetal development
Clonazepam	Avoid regular use; use only if clear indication such as seizure control
Cloxacillin	Not known to be harmful but observe caution
Contraceptives, oral	Epidemiological evidence suggests no harmful effects on fetus
Cytarabin	Avoid
Cyclophosphamide	Avoid
Dacarbazin	Avoid; ensure effective contraception during and for at least 3 months after administration to men or women
Dactinomycin	Avoid
Daunorubicin	Avoid
Deferoxamine	Teratogenic in animal studies; manufacturer advises use only if potential benefit outweighs risk
Dexamethasone	Benefit of treatment, for example in asthma, out weighs risk; risk of intrauterine growth retardation or prolonged or repeated systemic treatment; corticosteroid cover required by mother during labour; monitor closely if fluid retention
Diazepam	Avoid regular use; use only if clear indication such as seizure control
Diethylcarbamazine	Avoid; delay treatment until after delivery
Digoxin	May need dosage adjustment
Doxorubicin	Avoid; with liposomal product use effective contraception during and for at least 6 months after administration to men or women
Ephedrine	Increased fetal heart rate reported with parenteral ephedrine
Ergocalciferol	High doses teratogenic in animals but therapeutic doses unlikely to be harmful
Erythromycin	Not known to be harmful but observe caution
Ethambutol	Not known to be harmful but observe caution

Ethinylestradiol	Epidemiological evidence suggests to harmful effects on fetus
Etoposide	Avoid
Fluconazole	Avoid
Flucytosine	Teratogenic in animal studies; use only if potential benefit outweighs risk
Fluorouracil	Avoid
Furosemide	Not used to treat hypertension in pregnancy
Griseofulvin	Avoid; effective contraception required during and for at least 1 month after administration; also men should avoid fathering child during and for at least 6 months after administration
Hydrocortisone	Benefit of treatment, for example in asthma, out weighs risk; risk of intrauterine growth retardation or prolonged or repeated systemic treatment; corticosteroid cover required by mother during labour; monitor closely if fluid retention
Ibuprofen	Avoid unless potential benefit outweighs risk
Idoxuridine	Teratogenic in animal studies
Imipenem + cilastatin	Use only if potential benefit out weighs risk
Isoniazid	Not known to be harmful but observe caution
Ivermectin	Delay treatment until after delivery
Levodopa + carbidopa	Toxicity in animal studies
Levonogestrel	In oral contraceptives, epidemiological evidence suggest no harmful effect on fetus
Levothyroxine	Monitor maternal serum-thyrotrophin concentration dosage adjustment may be necessary
Medroxyprogesterone	Avoid; inadvertent use of depot medroxyprogesterone acetate contraceptive injection in pregnancy unlikely to harm fetus
Mefloquine	Use only if other antimalarials inappropriate
Mercaptopurine	Avoid
Methotrexate	Avoid; use effective contraception during and for at least 6 months after administration to men or women

	administration to men or women
Methyldopa metoclopramide	Not known to be harmful but observe caution
Metronidazole	Avoid high-dose regimens
Naloxone	Use only if potential benefit out weighs risk
Niclosamide	T. solium infections in pregnancy should be treated immediately
Nifedipine	May inhibit labour; some dihydropyridines are teratogenic in animals; but risk to fetus should be balanced against risk of uncontrolled maternal hypertension
Norethisterone	In oral contraceptives, epidemiological evidence suggests to harmful effects on fetus in higher dosage mascilinization of female fetuses and other defects are reported
Nystatin	No information available; but absorption from gastrointestinal tract negligible
Oxaminiquine	If immediate treatment not required schistosomiasis treatment should be delayed until after delivery
Paracetamol	Not known to be harmful but observe caution
Pentamidine isetionate	Potentially fetal visceral leishmaniasis must be treated without delay. Should not be withheld in trypanosomiasis even if evidence of meningoencephalitic involvement potentially fetal P. carinii pneumonia must be treated without delay
Pentavalent antimony compounds	Potentially fetal visceral leishmaniasis must be treated without delay
Phenoxymethyl penicillin	Not known to be harmful but observe caution
Phytomenadione	Use only if potential benefit out weighs risk
Praziquantel	T. solium infections in pregnancy should be treated immediately; benefit of treatment in schistosomiasis outweighs risk if immediately treatment not considered essential for fluke infections, treatment should be delayed until after delivery
Prednisolone	Benefit of treatment, for example in asthma, out weighs risk; risk of intrauterine growth retardation or prolonged or repeated systemic treatment; corticosteroid cover required by mother during labour; monitor closely if fluid retention

Procarbazine	Avoid
Proguanil	Benefit of prophylaxis and of treatment outweighs risk. Adequate fetal supplements should be given to mother
Promethazine	No evidence of teratogenicity
Propranolol	May cause intrauterine growth retardation, neonatal hypoglycaemia, and bradycardia; risk greater in sever hypertension
Pyrazinamide	Use only if potential benefit out weighs risk
Ranitidine	Not known to be harmful but observe caution
Sodium cromoglicate	Not known to be harmful but observe caution
Spironolactone	Toxicity in animal studies
Suramin sodium	In onchocerciasis, delay treatment until after delivery. In T.b rhodesiense treatment should be given even of meningoencephalopatic involvement
Suxamethonium	Mildly prolonged maternal paralysis may occur
Tamoxifen	Avoid possible effects on fetal development; effective contraception must be used during treatment and for 2 months after stopping
Vaccine, measles	Avoid; pregnancy should be avoided for 1 month after immunization
Vaccine, rubella	Avoid; pregnancy should be avoided for 1 month after immunization
Vancomycin	Use only if potential benefit out weighs risk. Plasma-vancomycin concentrating monitoring essential to reduce risk of fetal toxicity
Vecuronium	Use only if potential benefit out weighs risk
Vinblastine	Avoid
Vincristine	Avoid
Verapamil	Animal studies have not shown teratogenic effect; possibility that verapamil can relax uterine muscles should be considered at term; risk to fetus should be balanced against risk of uncontrolled maternal hypertension

MIGRAINE HEADACHES DURING PREGNANCY

The drug of choice for migraine headaches during pregnancy is acetaminophen. There appears to be no effect on the fetus as well as minimal effects on platelet function. It can be given in doses up to 1000 mg per dose. Other typical medications used in migraine treatment are not recommended during pregnancy which include the selective serotonin agonists (e.g., sumatriptan, naratriptan, zolmitriptan, and rizatriptan). Although they have not been proven to be harmful to humans, there have been no well-controlled studies to validate their use. Nonsteroidal anti-inflammatory drugs (NSAIDs) should also be avoided in pregnancy because of their ability to prolong pregnancy and labour. Ergotamine and dihydroergotamine are contraindicated in pregnancy because of their uterotonic effects.

Table 3: Drugs Used in the Treatment of Migraines during Pregnancy

Drug	Pregnancy Risk Category
Acetominophen (Tylenol®)	B
Ibuprofen (Motrin®)	B
Ergotamine tartrate (Ergotrate®)	D
Dihydroergotamine (Migranal®)	X
Prochlorperazine (Compazine®)	C
Sumatriptan (Imitrex®)	C
Naratriptan (Amerge®)	C
Zolmitriptan (Zomig®)	C

HYPERTENSION DURING PREGNANCY

Chronic hypertension in pregnancy is defined as high blood pressure that is present before pregnancy or diagnosed before the 20th week of gestation. Antihypertensive agents are used in women with a diastolic pressure of 100 mm Hg or higher (lower if end organ damage or renal disease is present) and in women with acute hypertension when pressures are greater than 105 mm Hg. According to the JNC

VI guidelines, pregnant women can be continued on most antihypertensive medications with the exception of angiotensin converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (Category X). ACE inhibitors are associated with chronic abnormalities (e.g., renal insufficiency requiring dialysis, growth retardation, and cranial malformations) and even death of the fetus. The drug of choice for high blood pressure diagnosed during pregnancy is methyldopa. Methyldopa has been studied extensively and is well tolerated in this population. When parenteral therapy is required, hydralazine is an effective alternative.

Table 4: Drugs Used for the Management of Hypertension During Pregnancy

Drug Class	Example	Pregnancy Risk Category	Comment
Central ŭ-agonist	(Aldomet®)	C	Drug of choice by the NHBPEP* Working Group
α-Blockers	Atenolol (Tenormin®)	C	
	Metoprolol (Lopressor®)	C	
	Labetolol(ŭ)®)	C	
Calcium antagonists	Diltiazem (Cardizem® CD, Dilacor®XR, Trizac®	C	Potential synergism with magnesium sulfate may lead to precipitous hypotension
	Verapamil (Calan®, Covera-HS®, Verelan®)	C	
ACE inhibitors	Captopril (Capoten®)	D	Fetal abnormalities including death, can be caused, and should not be used

			in pregnancy
Angiotensin IIReceptor blockers	Enalapril (Vasotec®) Lisinopril (Prinivil, Zestril®) Losarten (Cozaar®) Valsarten (Diovan®)	D D D D	
Diuretics	Bumetanide (Bumex®) Frosemide (Lasix®) Hydrochlorothiazide (HydroDIURIL®) Indapamide (Lozol®) Spironolactone (Aldactone®) Triamterine (Dyrenium®)	DCCBBDB	Recommended for chronic hypertension if prescribed before gestation or if patients are salt-sensitive. Not recommended in preclampsia
Directvasodilators	Hydralazine (Apresoline®) Minoxidil (Loniten®)	C C	Hydralazine is parenteral drug of choice vased on its long history of safety and efficacy

TOBACCO USE DURING PREGNANCY

A woman who smokes takes in poisons such as nicotine and carbon monoxide (the same gas that comes out of a car's exhaust pipe). These poisons get into the placenta, which is the tissue that connects the mother and the baby before it is born. These poisons keep a fetus from getting the food and oxygen it needs to grow. Smoking is associated with pregnancy complications, early menopause,

and reduced fertility. Women who smoke during pregnancy increase the risk of miscarriage, stillbirth, premature delivery, low birth weight babies, ectopic pregnancies (implanting of the embryo outside of the uterus), and infant death. Tobacco use during pregnancy slows the growth of a fetus, especially in women who smoke more than 1 pack per day. Infants are also more likely to die from Sudden Infant Death Syndrome (crib-death) if their mothers smoke. Second-hand smoke from other people also affects a pregnant woman and her fetus. For more information on smoking,

MEDICATIONS DURING PREGNANCY

There are some medications that we know cause harm when used in pregnancy and should be avoided. Some examples of these medications are:

Aspirin

Aspirin is a Category C drug. Studies of aspirin during pregnancy have been difficult to perform because many patients fail to report taking aspirin during their pregnancy because they forgot they had used it and it is a commonly used medication. Nevertheless, there have been many associated side effects to mothers and babies while taking full-dose aspirin during pregnancy. This is not the same as taking a baby aspirin, which is recommended for some women who are at high risk of developing pregnancy-associated complications. It is especially important to avoid aspirin during the last 3 months of pregnancy, because it can cause problems in the fetus or complications during delivery. Tylenol taken in moderation can be used as a substitute.

Accutane

Accutane, or isotretinoin, is a powerful prescription drug that can clear severe acne. If taken during pregnancy, it can cause birth defects (such as heart defects, small jaw, cleft palate, and skull and facial disfigurements) in about 1 of every 4 fetuses. It can also cause miscarriages. Currently, doctors will not prescribe Accutane to pregnant women, women who are trying to become pregnant, or women

who are not taking effective contraception and are at risk of pregnancy. Before being permitted to take Accutane, a woman of child-bearing age must sign a consent form stating that she has been fully informed of the drug's side effects.

Tegison

Tegison, or Etretinate, is a prescription drug to treat psoriasis. Pregnant women are forbidden to use this drug. Since it is not known how long pregnancy should be avoided after treatment stops, a woman must plan on never having children if she is treated with Tegison. Women of childbearing age must have a pregnancy test within 2 weeks before beginning treatment to make sure they are not pregnant. Contraception must be continued during treatment and for as long as you are able to become pregnant after treatment is stopped. Be sure to discuss this information with your doctor.

Thalidomide

Thalidomide is a sedative drug that was introduced in 1958 and widely used to treat the morning sickness of pregnancy. It was later found to cause miscarriage and severe birth defects, such as stunted, shortened limbs and other deformities of the arms and legs, cleft palate, deafness, and blindness. While it is not approved for general sale in the United States anymore, the FDA still allows Thalidomide to be used in certain studies for the treatment of other diseases and conditions, such as skin sores caused by lupus and leprosy. Thalidomide is also used to treat problems that are caused by other diseases, such as severe mouth ulcers and graft-versus-host disease (a kind of transplant rejection). Women of childbearing age should not participate in studies involving Thalidomide unless they are currently practicing abstinence (not having sexual intercourse) or a highly reliable form of birth control.

Psychiatric Disorders in Pregnancy

20% of women suffer from some type of psychiatric disorder during their pregnancy. From depression and anxiety to bipolar disorder and schizophrenia, pregnant women can suffer from

the same illness as women who are not pregnant. Doctors used to be very hesitant to prescribe psychiatric medications to pregnant women. In fact, most pregnant women were discouraged from taking any type of medication for fear drugs and pregnancy would not mix well. Today, more information is available on the effects that various psychiatric medications have on a fetus and, as a result, more pregnant women are able to keep up with treatments for their illnesses.If you are currently taking a psychiatric medication and are pregnant, or thinking about becoming pregnant, speak with your health care provider. Some prescription medications have few or no side effects during pregnancy and are safe to take. Others however, are associated with increased pregnancy risks including congenital birth defects, behavioral disorders, and perinatal syndromes, and are medications to avoid during pregnancy. All psychiatric medications cross the placenta during pregnancy, though in small amounts.

Measuring the Risk of Psychiatric Medicines During Pregnancy

All medicines are at some point tested for use during pregnancy. There is less data available about the effect of newer "atypical" psychiatric medicines on pregnancy because there has not been sufficient time to perform large enough trials. However, there are ample amounts of information on older, "typical" psychiatric medications for doctors to assess their effects during pregnancy.

When testing a psychiatric medication's effects on pregnancy, doctor's look for three things: the occurrence of birth defects (structural teratogenesis), the occurrence of behavioral problems (behavioral teratogenesis), and the occurrence of unusual symptoms directly after birth(perinatal syndromes). The rates of these three things are then compared to those rates found in pregnancies without psychiatric medication.

The following is a list of the major psychiatric medications used to treat depression, anxiety disorders, bipolar disorder, and schizophrenia, and the known effects of these drugs on pregnancy. Do not take any psychiatric medications during pregnancy without first consulting your health care provider.

Antidepressant Medications

Selective Serotonin Reuptake Inhibitors (SSRIs):

SSRIs are relatively new depression medications. Among others, they include Prozac, Celexa, Zoloft, and Paxil. Of the SSRIs, only Prozac has been widely tested in pregnant women. Prozac does not appear to increase the risk of any birth complications in baby. The other SSRIs also show no increased risks of major fetal malformations after preliminary studies and are assumed safe medications for pregnancy. There are some suggestions that SSRIs taken around the time of delivery may increase the possibility of prenatal syndromes including tremor, restlessness, and increased crying.

Tricyclics:

Tricyclic anti-depressant medications, like Tofranil and Pamelor, have been widely tested in pregnant women. They are among the safest to use during pregnancy, with no adverse effects on baby.

Monoamine Oxidase Inhibitors:

MAOIs, like Parnate and Nardil, are commonly prescribed for depression and anxiety disorders. They should not be used during pregnancy as they commonly react with other medications. Some research suggests that MAOIs may increase the risk of fetal malformation in the first trimester.

Anti-Anxiety Medications

Benzodiazepines:

Benzodiazepines are commonly prescribed to people suffering from anxiety disorders. Older studies suggest that benzodiazepines may increase the risk of cleft lip and palate in babies by 0.78%. However,

this information is highly debated. Benzodiazepines are also associated with prenatal syndrome, including feeding problems, hypothermia, and deficiency in baby's muscle tone.

Mood Stabilizers

Lithium:

Lithium is a known tetragen (tetragens interfere with the development of a baby's major organs, which occurs during the first trimester). Taken in the first trimester, Lithium increases the risk for Ebstein's Anomaly, a defect in the heart, by 10 times. It is also associated with perinatal syndrome when taken around the time of birth, including a bluish discoloration of the skin and decreased muscle tone.

Valproic Acid:

Valproic Acid is a known tetragen. Taken during the first trimester, it can increase the risk of fetal malformation by up to 4%.

Antipsychotic Medications

High-Potency Antipsychotics:

High-potency antipsychotics, like Haldol, are effective schizophrenia and bipolar medications. They are associated with no increased risk to fetus or baby, and are recommended for use during pregnancy in high-risk patients.

Low-Potency Anti-Psychotics:

Low-potency antipsychotics, such as Thorazine, are also used in the treatment of schizophrenia. They are not recommended for use during pregnancy, as they may increase the risk of fetal malformation.

Atypical Antipsychotics:

Atypical antipsychotics have recently been introduced to the market and include risperidone, olanzapine, ziprasidone, and quetiapine. There is not enough data to accurately identify the effects that

these medications may have on baby. A switch to a high-potency antipsychotic like Haldol is usually recommended.

Medications

Medicine for preeclampsia and high blood pressure during pregnancy may be used to:

Control high blood pressure

Lowering high blood pressure does not prevent preeclampsia from getting worse, because high blood pressure is only a symptom of the condition, not a cause. High blood pressure medicine is usually not used unless a pregnant woman's diastolic blood pressure (the second number) reaches levels of about 105 mm Hg (millimeters of mercury) and above.Expectant management is the preferred treatment for mild high blood pressure during pregnancy.

Prevent seizures

Magnesium sulfate is usually started before delivery and continued for 24 hours after delivery for women with pregnancy-related seizures (eclampsia) and those with moderate to severe preeclampsia.

Speed up fetal lung development

When possible, a corticosteroid (betamethasone or dexamethasone) is given to the mother prior to a premature birth (up to 34 weeks of gestation). This medicine matures the fetus's lungs over a 24-hour period, which lowers the risk of breathing problems after birth.

After childbirth: Taking high blood pressure medicine while breast-feeding

There are several commonly used high blood pressure medicines that have no reported effects on the breast-feeding baby. These medicines include labetalol and propranolol, which are most commonly recommended, as well as hydralazine and methyldopa. Nadolol, metoprolol, and nifedipine are detectable in mothers' milk, but they have no known effects on the breast-feeding baby.

CONCLUSION

Drug use during pregnancy should be completely under the control of a physician.Are three types of effects to the fetus during pregnancy. Either directly lethal drugs taken, as toxic effects or abnormal development of organs. Or the fetal-maternal placenta affect the exchange of oxygen between the blood and infects. By making some discomfort in the mother or indirectly affect the baby. No matter which way the seriousness and the size and the drug is in pregnancy, which determines the amount.During pregnancy, knowingly or unknowingly, some of the drugs used on babies with known adverse effects, 90-95 of every 100 pregnant women throughout pregnancy, drug use, even if a box. Especially during the first trimester of pregnancy are more lasting and severe harm of drugs and this month is sometimes unaware of the pregnancy, the situation is more alarming interests.Fetal damage, some medications are: cancer treatment drugs, hormones, steroids, diabetes, use of the pill, sedative drugs, including Aspirin, some painkillers, some antibiotics such, heart medications, etc.and alcohol.Levels of alcohol can be harmful is not well determined in detail about the damage evidence was obtained. Primarily to lower weighted birth, small head, mental retardation, cardiovascular abnormalities, such as joint disorders may improve matters. Alcohol use is more prevalent in mothers of infant mortality.

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