Stimulants and hallucinogens in Pregnancy

M.Shiehmorteza

Clinical Pharmacist


Cocaine
Nicotine
STIMULANTS
Amphetamine

Stimulants

Stimulants are drugs that

- stimulate the brain and the central nervous system
- increase the state of mental alertness
- decrease appetite

A) Amphetamines
B) Cocaine
C) Nicotine

Effects of Stimulants

- Wakefulness
- Alertness
- Increased energy
- Restlessness
- Euphoria
- Confusion
- Reduced appetite, increased talkativeness
- Increased breathing and heart rate
- Elevated blood pressure

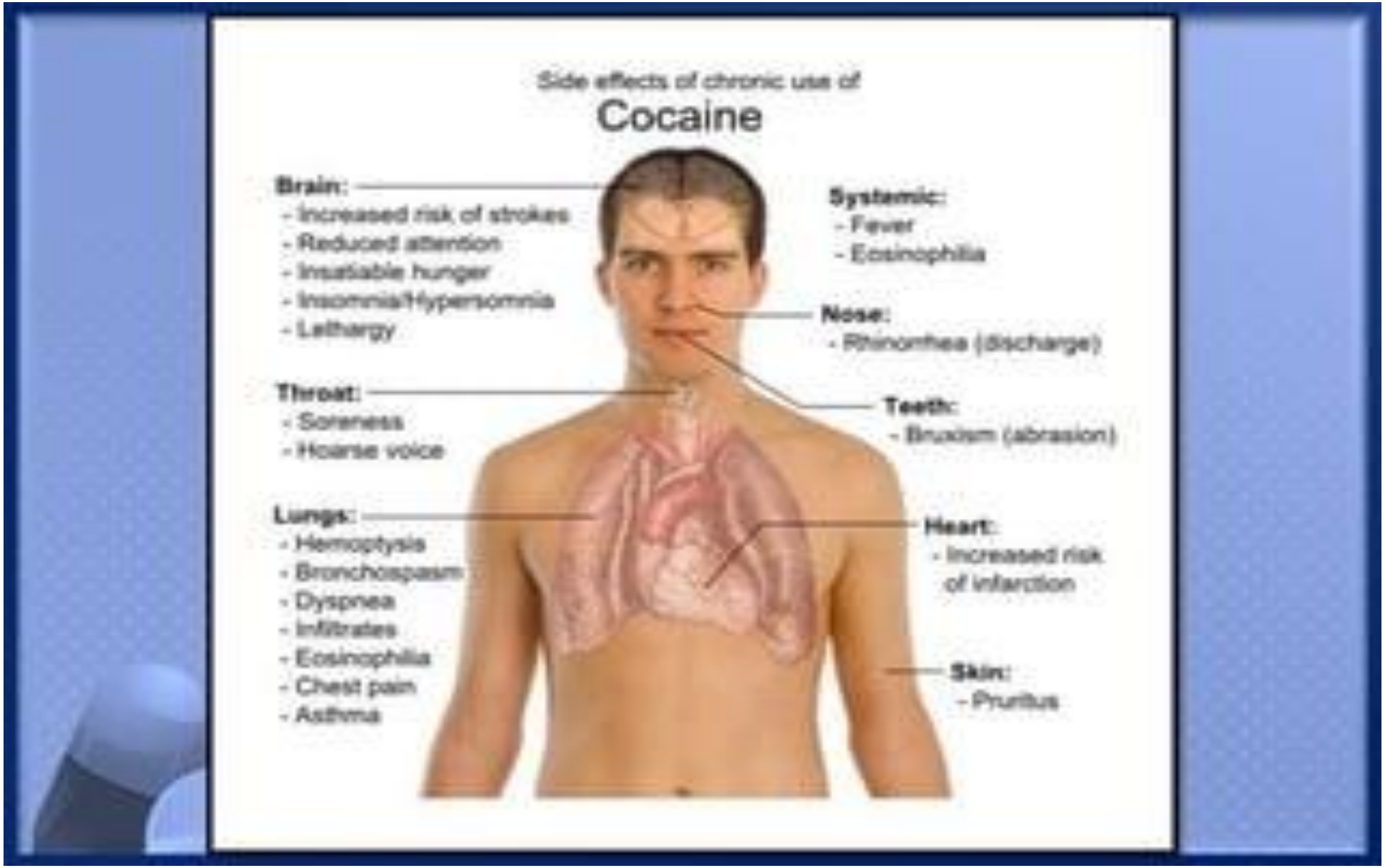
Cocaine

(*Erythroxylon coca* , local anesthetic & CNS stimulant)

Street name : Crack, Snow , Star dust, Charlie, Nose candy .

Sign & symptoms of cocaine abuse :

- Increase agitation .
- Disinhibition
- Change in concentration & focus .
- Common cold like symptoms .
- Increase movement .


Side effects of chronic use of
Cocaine
Brain:
- Increased risk of strokes
- Reduced attention
- Insatiable hunger
- Insomnia/Hypersomnia
- Lethargy
Throat:
- Soreness
- Hoarse voice
Lungs:
- Hemoptysis
- Bronchospasm
- Dyspnea
- Infiltrates
- Eosinophilia
- Chest pain
- Asthma
Systemic:
- Fever
- Eosinophilia
Nose:
- Rhinorrhea (discharge)
Teeth:
- Bruxism (abrasion)
Heart:
- Increased risk of infarction
Skin:
- Pruritus

Adverse Health Effects of Nicotine

- Nicotine exposure during adolescence can result in addiction.
- Nicotine can harm the developing adolescent brain.
- Nicotine delivered by e-cigarettes during pregnancy can result in multiple adverse consequences, including sudden infant death syndrome, and could result in altered corpus callosum, deficits in auditory processing, and obesity.
- Ingestion of e-cigarette liquids containing nicotine can cause acute toxicity and possibly death if the contents of refill cartridges or bottles containing nicotine are consumed.

Source: U.S. Department of Health and Human Services. E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.

E-cigarette Adverse Health Effects

- E-cigarettes expose users to several chemicals, in addition to nicotine: heavy metals (chromium, lead, manganese, nickel and zinc), arsenic, volatile organic compounds (propylene glycol or glycerol), all known to have adverse health effects.
- The health effects and potentially harmful effects of doses of heated and aerosolized constituents of e-cigarette liquids, including solvents, flavorants, and toxicants, are not completely understood.
- E-cigarettes can also be used to deliver other drugs, including marijuana. In 2016, one-third of U.S. middle and high school students who ever used e-cigarettes had used marijuana in e-cigarettes.

Sources (Bullets 1-2): U.S. Department of Health and Human Services. E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
Bullet 3: Trivers KF, Phillips E, Gentzke AS, Tynan MA, Neff LJ. Prevalence of Cannabis Use in Electronic Cigarettes Among US Youth. JAMA pediatrics. 2018;172(11):1097-1099.

Cocaine

- Maternal cocaine abuse has been associated with a number of adverse pregnancy outcomes, including preterm birth, premature rupture of membranes, and a number of other placenta-associated syndromes (e.g., placental abruption, placental infarction, and preeclampsia).
- It has also been associated with intrauterine growth restriction leading to low birth weight and small for gestational age infants.
- An increased risk of miscarriage has been noted but this association remains controversial.
- In a meta-analysis by Motherisk, polysubstance abusers who were also abusing cocaine had an increased risk of miscarriage compared with the reference group of drug-free mothers. However, when this analysis was completed with comparison of mothers who were abusing only cocaine with the drug-free control group, the effect was no longer observed.

- Early reports by Bingol and colleagues suggested that cocaine may act as a teratogen.
- However, this study was limited in its assessment of confounding factors and had some methodological limitations.
- The contribution of other sociodemographic and environmental risk factors to the observed association was suggested as early as in 1987 amid growing fears of a potential epidemic of harm due to in utero cocaine exposure.
- In subsequent and more methodologically sound studies, no specific pattern of gross congenital anomalies or syndromes has been identified.
- Therefore, it is thought that cocaine does not act independently as a gross structural teratogen.
-

IN UTERO COCAINE EXPOSURE: GROWTH, COGNITIVE, AND NEURODEVELOPMENTAL OUTCOMES

- Whether there is an effect of in utero cocaine exposure on long-term child growth remains uncertain. Studies have reported evidence of slower growth rates among prenatally exposed children up to the age of 10 years after other factors associated with child growth have been controlled for Some studies have reported that children exposed to cocaine prenatally had adverse neurodevelopmental outcomes.
- Reported outcomes include, but are not limited to,
- poorer adolescent functioning.
- poorer perceptual reasoning,
- impairment in procedural learning.
- internalizing, externalizing, and total behaviour problems.
- more symptoms of oppositional defiant disorder and attention deficit hyperactivity disorder,.
- impairment of executive function.
- adverse effects on short-term memory, and poorer language development.

Cocaine Abuse During Pregnancy Alex M. Cressman, MSc DOI:https://doi.org/10.1016/S1701-2163(15)30543-0

- However, recent systematic reviews and meta-analyses suggest that sociodemographic, environmental, and other factors such as those listed in the Table may make a contribution to these adverse neurodevelopmental outcomes that is equal to or even greater than cocaine.
- Further, a recent study showed that environmental “protective factors,” such as resilience, caretaker involvement, higher family socioeconomic status, and family support and resources reduce the trajectory of behavioural problems from in utero cocaine exposure.

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MATERNAL EFFECTS OF AMPHETAMINES IN PREGNANCY

- Little documentation exists regarding the effects of amphetamines in pregnant women, because attention for the most part has focused on their effects in the fetus.
- In a study of 53 amphetamine-addicted women who used the drug throughout pregnancy, maternal hypertension, tachycardia, proteinuria, prematurity, premature labor, and placental hemorrhage were the most common maternal complications.
- Because both amphetamines and cocaine increase systemic norepinephrine levels, the effects of maternal hypertension and maternal tachycardia are not surprising. However, one of the frequently reported toxic effects of amphetamine use is conspicuously absent from any descriptions of maternal effects of amphetamine use during pregnancy.
- In the nonpregnant state (and in men), common sequelae of amphetamine abuse are cerebrovascular accidents, cerebral hemorrhages, and strokes.
- In the literature describing the use of amphetamines during pregnancy, there are no case studies of cerebrovascular accidents occurring in pregnant women.

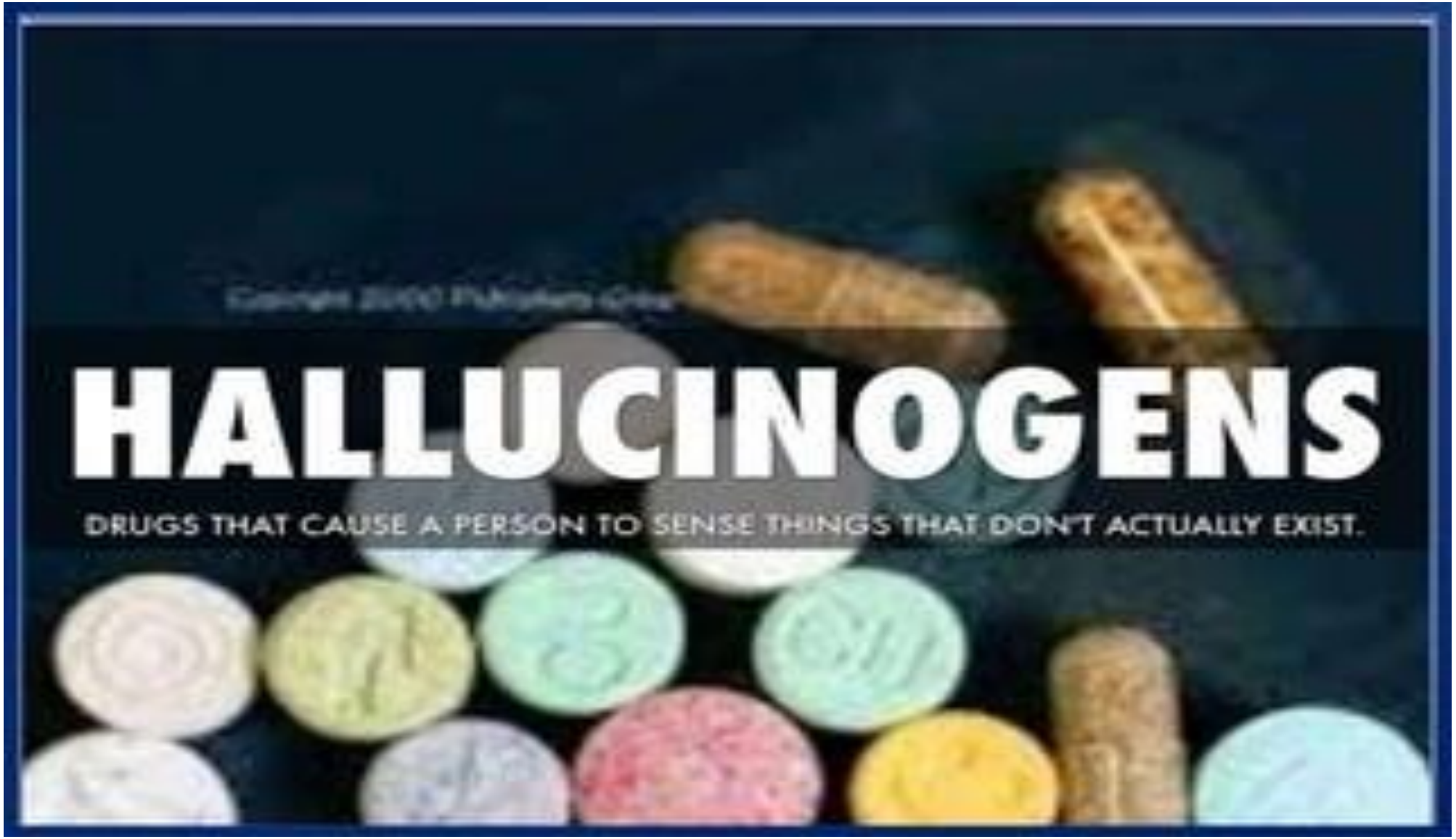
FETAL EFFECTS OF AMPHETAMINES IN PREGNANCY—HUMAN DATA

- Malformations and adverse outcomes reported with the use of amphetamine or methamphetamine during pregnancy include cleft lip, cardiac defects, low birth weight, growth reduction, reduced head circumference, prematurity, stillbirth, hyperbilirubinemia requiring exchange transfusion, cerebral hemorrhage, low body fat, mongolian spots,35 systolic murmur, and undescended testes.
- The reported malformations are those associated with amphetamine use during pregnancy. Whether these defects are related to the effects of amphetamine or are caused by the environment of the drug user or by other extraneous factors remains to be defined. The association becomes better defined by the number of reports demonstrating similar findings in different populations.

- Amphetamines Abuse During Pregnancy Alex M. Cressman, MSc DOI:https://doi.org/10.1016/S1701-2163(15)30543-0

- Moreover, in one report, three infants with oral clefts were known to be exposed to amphetamines on days , of gestation, which is within the crucial period of oral facial development.
- Clefting was associated with amphetamine use during pregnancy in 3 of 11 cases reported in polydrug-exposed infants in Australia. The author observed that the presence of these defects was associated with exposure to amphetamine before 7 weeks' gestation.
- Cardiac defects have been reported with cocaine exposure; however, there seems to be a greater incidence of cardiac anomalies with amphetamine exposure.
- Nora and co-workers were among the first to report the fetal cardiac malformations with prenatal amphetamine exposure.
- These investigators demonstrated an increased rate of transposition of the great vessels in humans and subsequently studied the cardiac and other effects of prenatal amphetamine exposure in greater detail in murine models. Other investigators have cited major cardiac anomalies, including double aortic arch,18 atrial-septal defect, and atrioventricular canal defect.

- Amphetamine-related consequences, including fetal growth restriction, reduced head circumference, low birth weight, and cerebral hemorrhages, have also been reported with prenatal cocaine exposure and are most likely related to the ability of amphetamine (and cocaine) to produce vasoconstriction via increasing circulating levels of norepinephrine and other vasoactive amines (serotonin and dopamine). These vasoconstrictive effects restrict nutrient delivery to the developing fetus and could also be related to, or enhanced by, the anorectic effect of amphetamine as an appetite suppressant.
- Systemic effects seen in the newborn with amphetamine or methamphetamine use during pregnancy include bradycardia and tachycardia.
- Most of these cardiovascular effects resolve, presumably after the drug has been eliminated, or when alterations in norepinephrine metabolism have recovered.
- However, visual cognitive effects and changes in behavior seem to be permanent.


HALLUCINOGENS
DRUGS THAT CAUSE A PERSON TO SENSE THINGS THAT DON'T ACTUALLY EXIST.

Hallucinogen

Hallucinogens are substances that

- alter sensory processing in the brain,
- causing perceptual disturbances,
- changes in thought processing, and depersonalization.

Types of hallucinogen

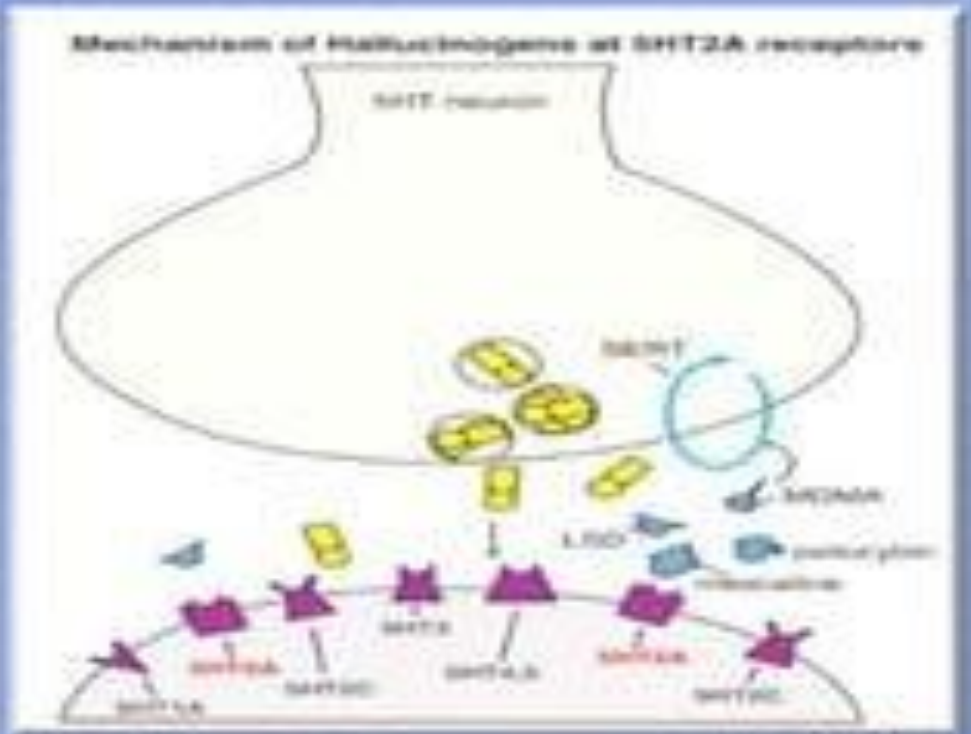
1. Psychedelics (Ex: LSD, Peyote, mescaline)
2. Dissociative (Ex: Magic mashroom, ketamin,pcp)
3. Deliriants (Ex: Datura /Jimson Weed)

Mechanism of action: LSD

Agonism and/or antagonism at 5-HT receptors subtypes

Lysergic Acid Diethylamide (LSD)

- 5-HT agonist at pre-synaptic receptors in CNS
- Activation of Sympathetic NS
- Hallucination with Brilliant Colors
- Mood alteration
- Tolerance & Physical dependence occurs
- No True dependence
- S/E ... Hyper reflexia.
- Nausea, Muscle weakness, Psychotic changes



What is LSD?

- Lysergic acid diethylamide, commonly known as LSD, is a very potent hallucinogenic drug. Although many people associate LSD use with the psychedelic ’60s, this drug is still commonly used today. According to recent results from the National Survey on Drug Use and Health, nearly 1 in 10 individuals aged 12 or older reported using LSD during their lifetime

- In addition to an altered state of mind that is characterized by hallucinations and delusions, some other common effects associated with LSD include increased blood pressure, rapid heart rate, dilated pupils, sleeplessness, and loss of appetite.
- Some of these side effects can be especially dangerous to a pregnant woman and may pose even greater risks to a developing baby.

LSD Affect Pregnant Women

- There are some findings that show the use of LSD during pregnancy can cause birth defects, although the majority of these studies were carried out a long time ago.
- These include documented cases of babies born with eye abnormalities, such as cataracts and retinal dysplasia, following maternal use of LSD during pregnancy.
- There are also several case reports of mothers who were administered LSD for medical reasons and subsequently gave birth to babies without any birth defects.

- LSD accumulates in the placenta during pregnancy, and findings from studies with rodents have shown that the drug can significantly compromise fetal blood flow.
- In another study, LSD produced changes in isolated rat uterine smooth muscle that are similar to the effects of agents used to hasten childbirth.
- These results suggest that the use of LSD might increase the chance to have a miscarriage.
- The use of LSD during pregnancy can also be related to pregnancy complications in less direct ways. Pregnant women who use LSD may have unhealthy and risky lifestyles that can pose a threat to the well-being of both the mother and her unborn child.
- For example, many people who use LSD may also use other drugs, such as alcohol or marijuana. There is substantial evidence that suggests prenatal exposure to marijuana increases the risk for preterm delivery and low birthweight, while alcohol consumption during pregnancy places the baby at risk for fetal alcohol syndrome, miscarriage, and stillbirth

- **Thanks about your attention**