

Congenital Infection



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Rout of Transmission



Transmission	Types
Intra-uterine	Trans-placental
	Ascending infection
Intra-partum	Contact with infected material during delivery, secretion , blood faces
Post-partum	Breast feeding
	Blood transfusion
	Nosocomial

Important Information for any congenital infection



- Background and prevalence
- Incidence of infection in pregnancy
- Risk of mother to child transmission
- Timing of mother to child transmission
- Risk factors for maternal and perinatal infections
- Consequences of both congenital/perinatal infection short and long term

Terminology



1. Congenital
2. Perinatal
3. Neonatal
- What is TORCH
 1. **T**oxoplasmosis,
 2. **O**ther (syphilis ,parvovirus &VZV),
 3. **R**ubella,
 4. **C**MV,
 5. **H**erpes(Hepatitis &HIV),

Risk and features of congenital infection

- Risk of congenital infection:

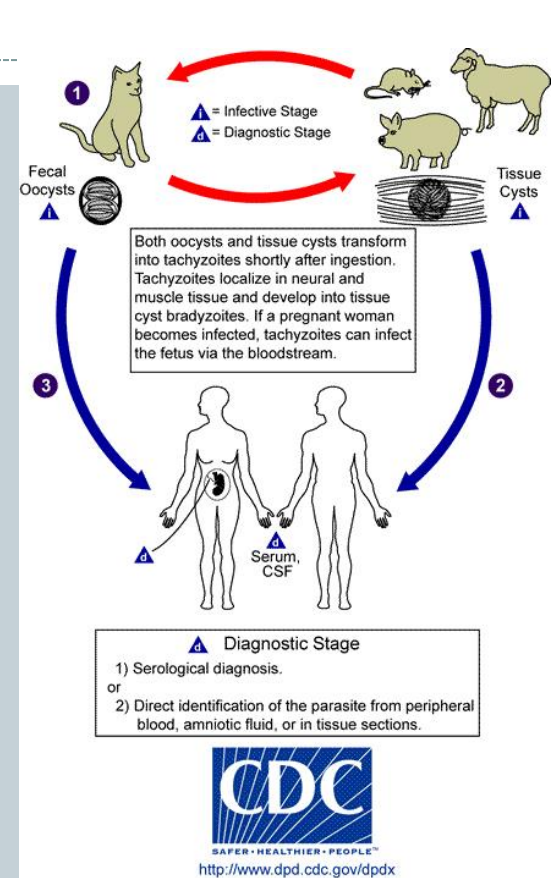
1. Organism (Teratogenicity)
2. Type of maternal infection (Primary, recurrent)
3. Time during pregnancy (1st, 2nd, 3rd Trimester)

- features of congenital infection :

1. Intrauterine growth retardation (IUGR)
2. Fever
3. Skin rash, jaundice
4. Micro-cephaly
5. Hepatosplenomegaly (HSM)
6. Generalized lymphadenopathy
7. Thrombocytopenia
8. IgM, Persistent IgG

Toxoplasmosis

- *Toxoplasma gondii*
- Definitive host is the domestic cat
- Contact with oocysts in feces



- Ingestion of cysts (meats, garden products)
- Can be transmitted from the mother to the baby

Epidemiology

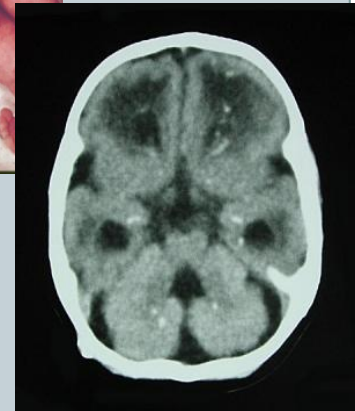
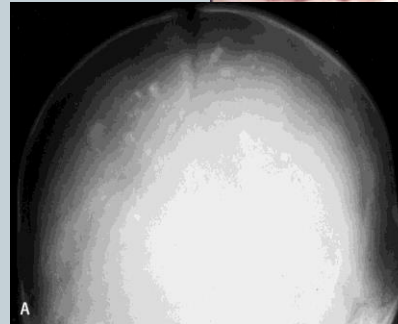


- European countries (ie France, Greece)
- Usually asymptomatic
- Primary maternal infection in pregnancy
- Infection (**Transmission**) **rate** higher with infection in 3rd trimester
- **Fetal death** higher with infection in 1st trimester

Clinical presentation



- Mostly asymptomatic
- Classic triad of symptoms:
 1. *Chorioretinitis*
 2. *Hydrocephalus*
 3. *Intracranial calcifications*



- Other symptoms include fever, rash, HSM, microcephaly, seizures, jaundice, thrombocytopenia, lymphadenopathy

Diagnosis , treatment and prevention

- Diagnosis

1. Maternal serology
IgM/IgA Acute , IgG
(Avidity)
2. Fetal ultrasound/ tissue
culture and PCR.
3. Newborn
 1. Serology
 2. Culture
 3. PCR

- Treatment

1. Spiramycin
2. Pyrimethamine and
sulfadiazine

- Prevention

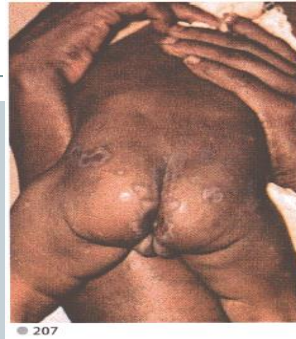
1. Avoid exposure to
contaminated food or
water and undercooked
meat
2. Hand washing

Syphilis



- Treponema pallidum (spirochete)
- Transmitted via sexual contact
- Mother with **primary** or **secondary** syphilis
- Typically occurs during **second half** of pregnancy

Clinical features



- Intrauterine death in 25%
- 3 major classifications

Congenital Syphilis



Frontal bossing, Short maxilla, High palatal arch, Saddle nose, Perioral fissures



Diagnosis and Treatment

Diagnosis

1. **RPR/VDRL:** non-treponemal test
2. **MHA-TP/FTA-ABS:** specific treponemal test
3. Confirmed if *T. pallidum* identified in skin lesions, placenta, umbilical cord, or at autopsy

Treatment

Penicillin G

Prevention

- RPR/VDRL screen in ALL pregnant women early in pregnancy and at time of birth

Parvovirus P 19



- Parvovirus P 19
- Causative agent of Fifth disease (erythema infectiosum)
- Spread by the respiratory route, blood and transplacental

Epidemiology

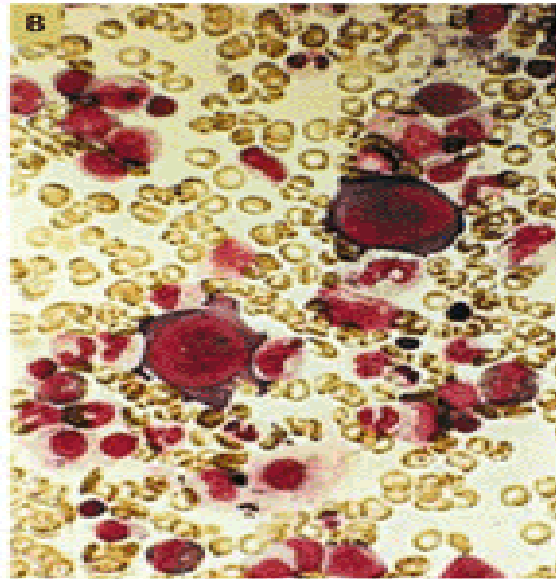


- Most of the population is eventually infected.
- Half of women of childbearing age are susceptible to infection.
- Risk of **fetal death highest** when infection occurs during the second trimester of pregnancy (1st 20 wks of pregnancy (12%).
- Minimal risk to the fetus if infection occurred during the third trimesters of pregnancy.

Clinical Faecture



- Known to cause fetal loss through hydrops fetalis; severe anaemia, congestive heart failure, generalized oedema and fetal death
- No evidence of teratogenecity



Diagnosis, and Treatment



- **Diagnosis**

- ultrasound
- Serology IgM, persistent IgG
- PCR

- **Treatment**

- intrauterine transfusions and administration of digoxin to the fetus.

Neonatal Varicella



- 90% of pregnant women already immune
- Primary infection during pregnancy carries a greater risk of severe disease

Clinical Features



- First 20 weeks of Pregnancy
- Up to 3% chance of transmission to the fetus, recognised congenital varicella syndrome; Scarring of skin, Hypoplasia of limbs, CNS and eye defects



Diagnosis



Test		Pregnant mother and Fetus	Neonate
Direct form the vesicles	Culture	+	+
	DFA	+	+
	PCR	+ Fetal blood and amniotic fluid	+
Serology	IgM	+	+
	Rising IgG	+	
US and MRI		+	

Treatment and Prevention



- *Acyclovir* at first signs of varicella pneumonia
- Pre-exposure; live-attenuated vaccines before or after pregnancy but not during pregnancy.
- **Postexposure** Zoster immunoglobulin to susceptible pregnant women and infants whose mothers develop varicella during the last **5 days** of pregnancy or the first **2 days** after delivery and premature baby <28 wks of gestation

rubella



- R=rubella
- RNA enveloped virus, member of the togaviridae family
- Spread by respiratory droplets and transplacentally

Epidemiology

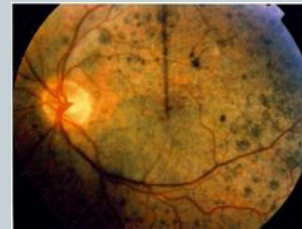


- Vaccine-preventable disease
- No longer considered endemic.
- Mild, self-limiting illness
- Infection earlier in pregnancy has a higher probability of affected infant (first 12 wks 70% and 13-16 wks 20% and rare >16 wks of pregnancy)

Clinical Features



- Sensorineural hearing loss (most common)
- Cataracts, glaucoma
- “Salt and Pepper” retinopathy
- Cardiac malformations
- Neurologic (less common)
- Others to include growth retardation, bone disease, HSM, thrombocytopenia, “*blueberry muffin*” lesions



Diagnosis



- Maternal IgG is useless!
- Viral isolation virus from nasal secretions, throat, blood, urine, CSF.
- Serologic testing. IgM = recent postnatal or congenital infection.
- Rising monthly IgG titers suggest congenital infection.

Treatment Prevention



- Supportive care only with parent education
- Prevention by immunization
- Maternal screening
- Vaccinate if not immune (avoid pregnancy for three months)

cytomegalovirus

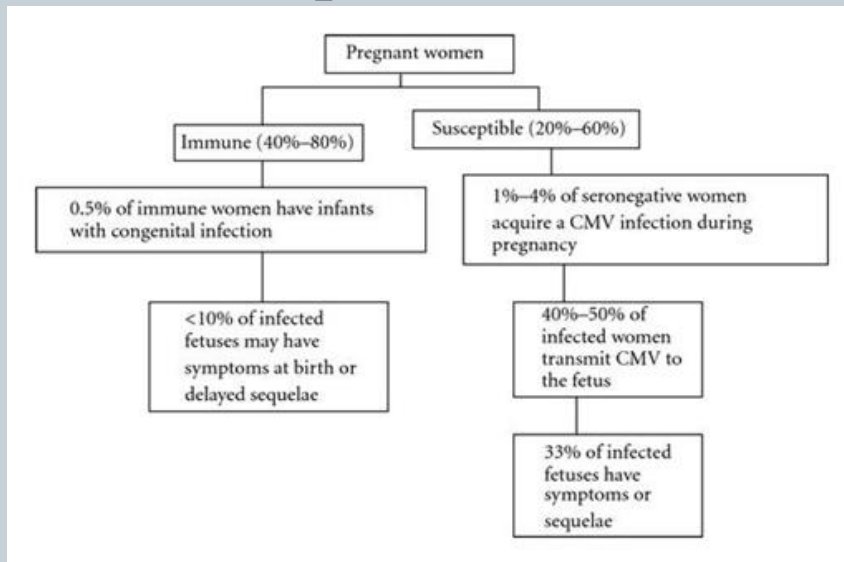


- C=cytomegalovirus
- Most common congenital viral infection~40,000 infants per year.
- Mild, self limiting illness

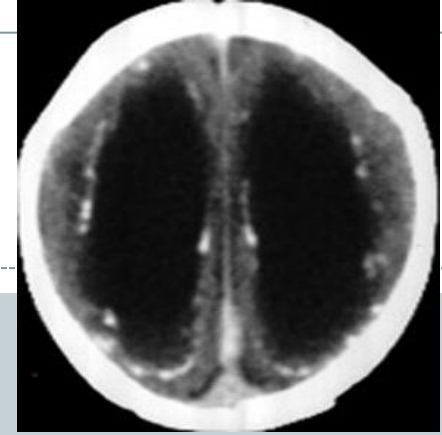
Epidemiology



- Transmission can occur with primary infection or reactivation of virus but 40% risk of transmission in **primary** infection
- Increased risk of **transmission later** in pregnancy but more severe sequelae associated with **earlier acquisition**



Clinical presentation



- 90% are asymptomatic at birth
- Up to 15% develop symptoms later
- Microcephaly, periventricular calcifications, neurological deficits, HSM, petechiae, jaundice, chorioretinitis
- >80% develop long term complications: Hearing loss, vision impairment, developmental delay



Diagnosis



- Maternal IgG shows only past infection
- **Viral isolation from urine or saliva in 1st 3 weeks of life**
- Viral load and DNA copies can be assessed by PCR
- Detection of Cytomegalic Inclusion bodies in affected tissue
- Serologies not helpful given high antibody in population

Treatment Prevention



- Ganciclovir x6wks in symptomatic infants

herpes simplex



- H=herpes simplex (HSV)
- HSV1 or HSV2

Epidemiology



- Primarily transmitted through infected maternal genital tract
- Primary infection with greater transmission risk than reactivation
- Rationale for C-section delivery prior to membrane rupture

Clinical presentation



- Most are asymptomatic at birth
- 3 patterns of equal frequency with symptoms between birth and 4wks: Skin, eyes, mouth , CNS disease, Disseminated disease (present earliest)
- Initial manifestations very nonspecific with skin lesions NOT necessarily present



Diagnosis and treatment

Diagnosis

- Culture of maternal lesions if present at delivery
- Cultures in infant
- CSF PCR
- Serologies is useless

Treatment

- High dose of acyclovir