Transplacental infections

classification	Timing of event	mechanism
Congenital: Mostly viral [TORCH] • Toxoplasmosis • Other [syphlis - parvo - VZV] • Rubella • CMV • Herpes [Hepatitis - HIV] **Common findings:** majority asymptomatic • Intrauterine growth retardation(IUGR) • Hepatosplenomegaly(HSM) • Thrombocytopenia • Microcephaly Preventative and therapeutic measures possible for some agents	In utero	Trans placental Risk of IUI & fetal damage: • Type of organism (teratogenic) • Type of maternal inf.(1^{o},Recurrent) • Time of inf .(1^{st},2^{nd} or 3^{rd}) 1^{o} Maternal infection in the first half of pregnancy poses the greatest risk to the fetus
Perinatal	During labor	Exposure to genital secretions and blood
Neonatal Serelogical DX: • IgM antibody [absence of fetal IgM at birth does not exclude inf] • Persistence of specific IgG antibody >12 ms of age	After birth	Direct contact breast feeding or nosocomial exposure

Tocoplasma Gondii [congenital obligate intracellular parasite]	
Forms	• Oocyst: shed in cat feces • Tachyzoite: rapidly deviding acute stage • Bradyzoite: slowly deviding chronic phase If a person is Bradyzoite and there is a decrease in immunity they will go into the tachyzoite phase
Transmission	• Ingestion of Oocyst: from contaminated fingers / soil / water • ingestion of cyst : from undercooked meat • blood transfusion or organ transplant

Infection info	• most are due to 1ry maternal infection
	• Rarely from reactivation of latent inf
	• Most (70-90%) are asymptomatic at birth but are still at high risk of developing abnormalities:
	  ○ Classic triad : Chorioretinitis / neurologic [hydrocephalus - intracranial calcification]
	  ○ Other signs: rash, HSM, jaundice, LAP, microcephaly, seizures, thrombocytopenia.
	  ○ Abortion & IVD

Dx	• Pregnant mother: serology - IgM - IgG - IgG avidity - IgG seroconversion
	• Infant:
	  ○ Prenatal: PCR - Culture - serial U.S
	  ○ Postnatal:
	  ▪ serology [IgG - IgM / ↑ IgG or persistently +ve >12 ms]
	  ▪ PCR
	  ▪ Culture
	  ▪ Evalution of infant (ex, neuroimaging)

Tx & prevention	• Spiramycin. pyrimethamine& sulfadiazine • avoid cat feces - wash hands / fruits / surfaces raw meat - cook all meats well

Parvovirus B19 [congenital - Parvoviridae / non enveloped - icosahadral - ssDNA Virus]	
Epidemiology	• Worldwide distribution • Humans are known hosts • Transmission [Respiratory route - Transplacental route - Blood transfusion]

Clinical	• Acquired: immunocompetent - immunocompromised --> Erythema infectiosum
	• Congenital : Risk of congenital infection is greatest when inf occur in 1st 20 wks
	  ○ Inf in the 1st trimester --> IUD (Intrauterine death)
	  ○ Inf in the 2nd trimester --> HF (Hydrops fetalis)
	  ○ Inf in the 3rd trimester --> Lowest risk
	
	Cause fetal loss through hydrops fetalis,severe anaemia,CHF, generalized oedema and fetal death

Dx	• Pregnant mother: Specific IgM - IgG seroconversion • Prenatal : Not grow in cell culture - PCR - U.S (hydrops)
Tx	• Intrauterine transfusion
prevention	• Hygiene practice - No vaccine (TRIAL)

Varicella zoster virus / VZV [congenital - Herpesviridae/ enveloped - icosahadral - dsDNA Virus]	
Transmission	• Respiratory & Transplacental

Clinical	• Acquired:
	  ○ Varicella / Chickenpox: 1° illness - Generalized vesicular rash
	  ○ Zoster / Shingles: Recurrent form - Localized Vesicular Rash
	• Congenital :
	  ○ VZV infection in Pregnancy:
	  ▪ Primary infection carries a greater risk of severe disease in particular pneumonia and its rare
	  ○ Intrauterine infections
	  ▪ congenital varicella syndrome: 1st 20 ws of preg / CVS ~2% / skin scarring / limbs hypoplasia / CNS & eye defects
	  ▪ Neonatal varicella: <5 d of delivery --> severe / >5 d before delivery --> mild

Dx	• Pregnant mother:
	  ○ Direct sample:
	  ▪ Vesicular fluid for virus isolation
	  ▪ Cells scraping from the base of vesicles --> IF test (Ag)
	  ▪ DNA-VZV by PCR
	  ○ Serology : IgM AB
	• Infant:
	  ○ Prenatal:
	  ▪ VZV DNA in Fetal Bl or AF or placenta villi
	  ▪ VZV IgM in Fetal Bl.
	  ▪ U.S
	  ○ Postnatal:
	  ▪ VZV IgM
	  ▪ virus isolation
	  ▪ VZV DNA in VF or CSF (CNS INF)

Tx	• Acyclovir

Prevention	• Post exposure: VZIG
	  ○ susceptible pregnant women have been exposed to VZV.
	  ○ infants whose mothers develop V < 5 days of delivery or the first 2 days after delivery.
	• Pre exposure: live attenuated vaccine

Rubella virus [congenital - Togaviridae / enveloped - icosahadral - ssRNA Virus]	
Transmission	• Respiratory & Transplacental
Pathogenesis	• infection of nasopharynx and lungs of the mother --> goes to Lymph nodes& reticuloendothelial system --> blood --> if she is pregnant --> penetration of placenta --> infect fetus • Classic triad / CRS : ○ Cataracts - deafness - Cardiac problems (PDA)- Neural defects - growth retardation - bone disease - HSM - ↓ PLT [Blueberry muffin lesion]
Clinical	• Acquired: Maculopapular rash (German measles) • Congenital : [Normal --> Congenital Rubella Syndrom --> IntraUterine Death] Risk of acquiring congenital rubella infection varies and depends on gestational age of the fetus at the time of maternal infection. first 12 w --> 70% risk
Dx	• Pregnant mother: serology [Rubella specific IgM - IgG seroconversion] • Infant: ○ Cell culture & RT-PCR ▪ (aminiotic fluid & chorionic villi)fetus ▪ (nasal secretion , throat, urine &blood) newborn ○ Serological diagnosis ▪ Rubella specific IgM ▪ Persistance & rising titres of anti-rubella ▪ IgG in the infants serum beyond 9-12 ms of age
Prevention	• Routine antenatal screening: ○ Rubella specific IgG ○ Non-immune women --> vaccination (avoid pregnancy for 3 months). • vaccination : ○ before or after pregnancy but not during pregnancy.

CMV [congenital - Herpesviridae / enveloped - icosahadral - dsDNA Virus]	
Transmission	• Horizontal : ○ Children -> saliva ○ later in life --> sexual - Blood - organ transplant • Vertical : ○ 1ry --> 40% ○ recurrent --> 1% * latent form --> reactivation --> recurrent inf * Transplacental - during birth [infected canal] - breast milk * mostly asymptomatic  Blueberry muffin
Cytomegalic inclusion disease	• CNS abnormalities [microcephaly, periventricular calcification] • Eye - chorioretinitis * Ear - sensorineural deafness • Liver – HSM and jaundice. *Lung - pneumonitis • Heart - myocarditis *Thrombocytopenic purpura
Dx	• Pregnant mother: serology [CMV IgM - CMV IgG - IgG Avidity] • Infant: ○ Prenatal : PCR - Culture - CMV IgM - U.S ○ Post natal: by *isolating CMV or detection of its genome* in first 3 wks of life ▪ Body fluid : urine, saliva, blood By [Standard tube culture method - Shell vial assay- PCR] ▪ Histology: inclusion bodies [owl's eyes] ▪ serology: CMV IgM
Tx & prevention	• Symptomatic infant --> Ganciclovir * asymptomatic --> not recommended • Education [Hygine - hand washing] - Vaccine [not available / trial]

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