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CONGENITAL INFECTIONS

CONGENITAL INFECTIONS OVERVIEW

- ◉ Rubella
- ◉ CMV
- ◉ Parvovirus
- ◉ Toxoplasmosis

CONGENITAL INFECTIONS OVERVIEW

- ◉ Epidemiology and pathophysiology
- ◉ Manifestations of congenital infection
- ◉ Diagnosis of congenital infection
- ◉ Prevention and treatment

RUBELLA EPIDEMIOLOGY

- ◉ RNA virus
- ◉ Only a single serotype
- ◉ Occurs primarily in children and adolescents

RUBELLA EPIDEMIOLOGY

- ◉ With licensure of an effective vaccine in 1969, the frequency of infection has declined by 99 %
- ◉ Accordingly, congenital infection is extremely rare

RUBELLA PATHOPHYSIOLOGY

- ◉ Transmission is by respiratory droplets
- ◉ Respiratory tract --> cervical lymph nodes --> hematogenous dissemination
- ◉ Incubation period is 2 to 3 weeks

RUBELLA
CLINICAL MANIFESTATIONS

- Malaise
- Headache
- Myalgias and arthralgias

RUBELLA
CLINICAL MANIFESTATIONS

- Post-auricular adenopathy
- Conjunctivitis
- NON-PRURITIC, ERYTHEMATOUS, MACULOPAPULAR RASH

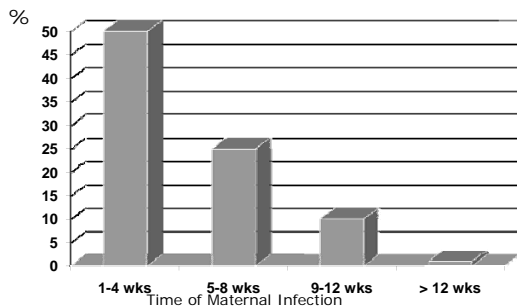
RUBELLA
CLINICAL MANIFESTATIONS



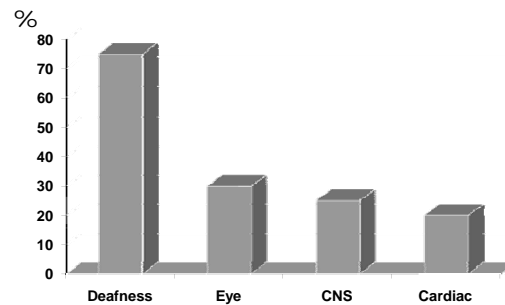
RUBELLA
CLINICAL MANIFESTATIONS



RISK OF CONGENITAL RUBELLA



MANIFESTATIONS OF CONGENITAL RUBELLA



CONSEQUENCES OF CONGENITAL RUBELLA

- ◎ Only 25 % attend mainstream schools
- ◎ Estimated lifetime cost of caring for an affected child - \$300,000

OBSTETRIC MANAGEMENT OF CONGENITAL RUBELLA

- ◎ Diagnosis is by ultrasound
- ◎ Management options
 - Pregnancy termination
 - Expectant management

PREVENTION OF CONGENITAL RUBELLA



- ◎ Vaccination
- ◎ Avoidance of exposure if susceptible

CMV EPIDEMIOLOGY

- ◎ DNA virus
- ◎ Humans are only host
- ◎ May remain latent in host cells

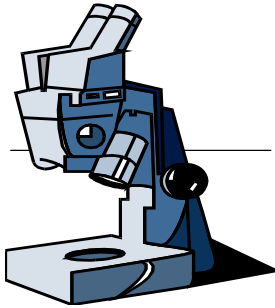
CMV EPIDEMIOLOGY

- ◎ Horizontal transmission
- ◎ Vertical transmission
 - In utero
 - During delivery
 - Breast feeding

CMV CLINICAL MANIFESTATIONS

- ◎ Malaise
- ◎ Fever
- ◎ Lymphadenopathy
- ◎ Hepatosplenomegaly

CMV DIAGNOSIS



- ◉ Cytology
- ◉ Serology
- ◉ Culture
- ◉ PCR

CONGENITAL CMV DETERMINANTS OF FETAL RISK

- ◉ Primary vs recurrent maternal infection
- ◉ Trimester of exposure

CONGENITAL CMV DETERMINANTS OF FETAL RISK

- ◉ THE GREATEST RISK IS ASSOCIATED WITH PRIMARY MATERNAL INFECTION IN THE FIRST HALF OF PREGNANCY

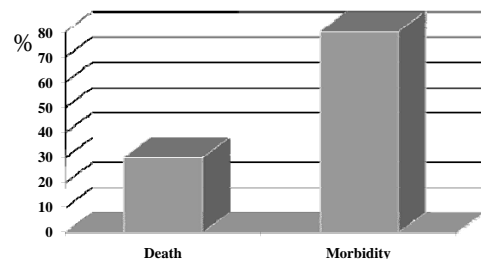
CONGENITAL CMV DETERMINANTS OF FETAL RISK

- ◉ Recurrent maternal infection poses much less risk to fetus
- ◉ Infection acquired during delivery or via breast feeding poses negligible risk

RISK OF CONGENITAL CMV WITH PRIMARY MATERNAL INFECTION

- ◉ 1 to 4 % of pregnant women seroconvert→
- ◉ 40 - 50 % of fetuses are infected→
- ◉ 5 - 15 % of these fetuses will be symptomatic at birth

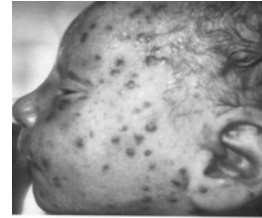
OUTCOME OF PRIMARY CMV INFECTION



MANIFESTATIONS OF SEVERE CONGENITAL CMV INFECTION

- ⊙ Hepatosplenomegaly
- ⊙ Intracranial calcifications
- ⊙ Jaundice
- ⊙ Growth restriction
- ⊙ Chorioretinitis
- ⊙ Hearing loss

SEVERE CONGENITAL CMV INFECTION



SEVERE CONGENITAL CMV INFECTION



RISK OF CONGENITAL CMV WITH RECURRENT MATERNAL INFECTION

- ⊙ Only 5 - 10 % of infants become infected
- ⊙ None are symptomatic at birth
- ⊙ Late sequelae include hearing and visual defects and developmental delays

DIAGNOSIS OF CONGENITAL CMV INFECTION

- ⊙ Amniocentesis - viral culture and PCR
- ⊙ Ultrasound

ULTRASOUND DIAGNOSIS OF CMV INFECTION



ULTRASOUND DIAGNOSIS OF
CMV INFECTION



PREVENTION OF CONGENITAL CMV
INFECTION

- ⊙ Vaccine is not available
- ⊙ Anti-viral drugs do not prevent fetal injury
- ⊙ Anti-CMV antibody may be effective
- ⊙ Key to prevention is “universal precautions”

PARVOVIRUS
EPIDEMIOLOGY

- ⊙ DNA virus
- ⊙ Only a single serotype exists
- ⊙ Humans are only known host

PARVOVIRUS
EPIDEMIOLOGY

- ⊙ Transmission is by respiratory droplets and by blood
- ⊙ Incubation period is 4 to 20 days

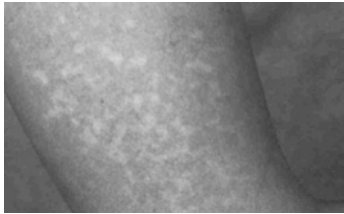
PARVOVIRUS
CLINICAL MANIFESTATIONS

- ⊙ Erythema infectiosum (fifth disease)
- ⊙ Transient aplastic crisis

PARVOVIRUS
ERYTHEMA INFECTIONIOSUM



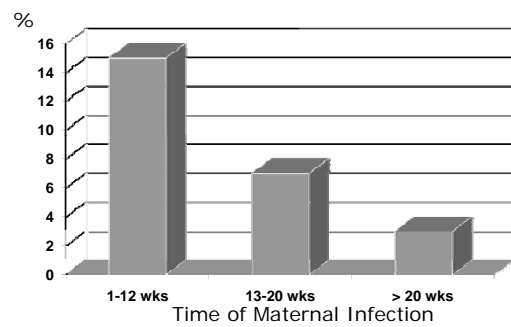
PARVOVIRUS ERYTHEMA INFECTIONOSUM



CONGENITAL PARVOVIRUS PATHOPHYSIOLOGY

- ⊙ Virus crosses the placenta and destroys red cell precursors
- ⊙ Fetal anemia --> high output congestive heart failure --> hydrops fetalis
- ⊙ Virus also directly injures myocardial cells

RISK OF CONGENITAL PARVOVIRUS INFECTION



DIAGNOSIS OF CONGENITAL PARVOVIRUS INFECTION



- ⊙ Ultrasound
 - Identification of hydrops
 - MCA doppler velocimetry

TREATMENT OF CONGENITAL PARVOVIRUS INFECTION



- ⊙ Intrauterine transfusion

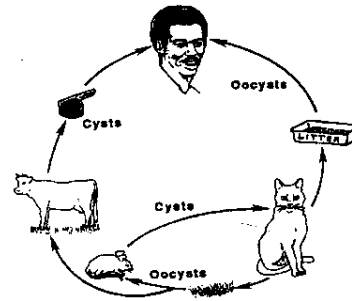
CONGENITAL PARVOVIRUS PROGNOSIS

- ⊙ If infant survives the hydropic state, the long-term prognosis is usually favorable

TOXOPLASMOSIS EPIDEMIOLOGY

- *Toxoplasma gondii* is a protozoan
- Organism exists in three forms
 - Trophozoite
 - Cyst
 - Oocyst

TOXOPLASMOSIS EPIDEMIOLOGY



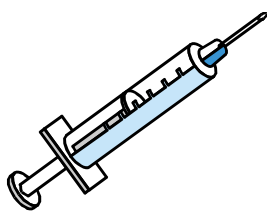
TOXOPLASMOSIS CLINICAL MANIFESTATIONS

- Most infections are asymptomatic
- When symptoms are present, they mimic mononucleosis

TOXOPLASMOSIS CLINICAL MANIFESTATIONS

- Toxoplasmosis may cause devastating infection in the immunocompromised host
 - Chorioretinitis
 - CNS infection → brain abscess

TOXOPLASMOSIS DIAGNOSIS



- Histology
- Serology

CONGENITAL TOXOPLASMOSIS

- The key danger is primary toxoplasmosis infection
- Greatest risk to the fetus results from maternal infection in first half of pregnancy
- Approximately 40 % of fetuses will be infected when primary maternal infection develops at < 20 weeks gestation

MANIFESTATIONS OF CONGENITAL TOXOPLASMOSIS

- Hepatosplenomegaly
- Chorioretinitis
- CNS injury
- Seizures
- Mental retardation

DIAGNOSIS OF CONGENITAL TOXOPLASMOSIS

- Amniocentesis - PCR

- Ultrasound

TREATMENT OF CONGENITAL TOXOPLASMOSIS

- Treatment of mother while fetus is still in utero
- Early treatment of the infant

PREVENTION OF CONGENITAL TOXOPLASMOSIS



- Use precautions when handling cat litter box

- Do not eat inadequately cooked meat

CONGENITAL INFECTIONS CONCLUSIONS

- **Congenital rubella** – key is prevention by universal vaccination

- **Congenital CMV** – key is prevention of exposure in pregnancy

CONGENITAL INFECTIONS CONCLUSIONS

- **Congenital parvovirus** – avoidance of exposure is difficult, but intrauterine transfusion is life-saving

CONGENITAL INFECTIONS

CONCLUSIONS

- ◎ **Congenital toxoplasmosis** –
key is avoidance of exposure
during pregnancy