

## Perinatal Infections

### Routine Screening : Issues and Management

Reproductive Medicine and Urology Block – 2004  
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## Perinatal Infections Routine Screening

- Routine screening for all pregnant women at the first prenatal visit
- Infections currently screened for at this time include: syphilis, Hepatitis B, HIV (require verbal consent for this), rubella, cervical cultures for Chlamydia and gonococcus, and urine culture for bacteruria, including group B strep.

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## Perinatal Infections Non-Routine Testing

- Women with a previous history of preterm delivery (<36 weeks) should also be screened for bacterial vaginosis.
- Women with symmetrical IUGR should be screened for TORCH infections
- Other infections with perinatal implications include Parvovirus, Varicella, and HSV 2 ( Herpes Simplex).
- REFER THESE PATIENTS WITH HISTORY OF THESE CONCERNS OR EXPOSURE TO A TERTIARY PERINATAL CENTER

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## Non-routine Testing

- TORCH INFECTIONS
  - Toxoplasmosis
  - Rubella
  - Cytomegalovirus
  - Herpes/Hepatitis

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## Perinatal Infections Routine Screening

- Syphilis
  - Due to the process of a spirochete Treponema Pallidum
  - 4 stages to the disease in the adult which include: Primary, Secondary, Early Latent, Late latent

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## Routine Screening Syphilis

- Primary
  - Chancre appears after an incubation period of 10 to 90 days.
  - Without treatment, this will usually resolve in 2 to 6 weeks.
  - Probability for fetal infection at this stage is 50%

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## Routine Screening Syphilis

- Secondary
  - Maculopapular rash involving palms and soles
  - Clears spontaneously in 2 to 6 weeks
  - Risk of fetal infection during this stage is 50%

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## Routine Screening Syphilis

- Early Latent
  - < 4 years
  - May be associated with reactivation of secondary symptoms
  - Risk of infection to the fetus is 40%

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## Routine Screening Syphilis

- Late Latent
  - > 4 years
  - Not infective sexually, but risk of fetal infection is still 10%
  - If no treated in first 3 stages, 1/3 of patients will go onto tertiary syphilis involving the CNS and CV systems

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## Routine Screening Syphilis

- Congenital Infection:
  - Can infect the fetus as early as 6 weeks
  - Clinical manifestations not seen until fetal immunocompetence develops around 16 weeks
  - The clinical spectrum of fetal infection includes stillbirth and neonatal death

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## Routine Screening Syphilis

- Congenital Infection
  - After birth, there can be early and late congenital syphilis
  - Early develops 10 to 14 days after birth and includes a rash, hepatosplenomegaly, and jaundice
  - Late develops if not treated during early neonatal phase

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## Routine Screening Syphilis

- Manifestations of Late Congenital Syphilis
  - Hutchinson's Teeth
  - Mulberry Molars
  - Interstitial keratitis
  - Eighth nerve deafness
  - Saddle nose
  - Saber shins
  - Rhagades
  - CV stigmata

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## Routine Screening Syphilis

- Non-specific tests: VDRL and RPR
- Treponema Specific Tests: FTA-ABS and MHA- TP
- All pregnant women should be treated with Penicillin as recommended by the Center for Disease Control
- Pen allergic patients should be desensitized, as this is the best therapy

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## Routine Screening Syphilis

- Congenital syphilis is unusual if the mother has been properly treated during pregnancy
- Congenital syphilis should be confirmed by CSF in the neonate and treatment according to the CDC recommendations.

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## Routine Screening Hepatitis B

- Maternal chronic carriers with HbeAg and HbsAG have a 90% risk of transmitting infection to the newborn and having them become chronic carriers.
- Risks for being a chronic carrier are 50% chance of dying of cirrhosis and hepatoma in males and 15% in females

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## Routine Screening Hepatitis B

- Modes of fetal infection include transplacental and during vaginal labor
- C-section does not necessarily prevent neonatal infection
- Breast-feeding is not contraindicated in the immunized infant

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## Routine Screening Hepatitis B

- All pregnant women are screened to target neonatal immunoprophylaxis
- All pregnant women who present in labor should be treated as + Hep B status until proven otherwise, and therefore the neonates treated accordingly

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## Routine Screening Hepatitis B

- Immunoprophylaxis:
  - HBIG for passive protection within 36 hours after birth
  - Hep B vaccine (recombinant DNA) given 12 hours to 7 days after delivery, followed by 2 boosters at 3 and 6 months
  - Current recommendations to give to all babies of HBsAG+ moms regardless of HBe status, and all teenagers regardless of HBs status because of high risk lifestyles

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## Routine Screening Hepatitis B

- Reasons to err on over vaccinating newborns with HB vaccine
  - All children are now being routinely vaccinated at 10 years anyway
  - Children born to HBsAg seropositive mothers who escape perinatal infection have 60% chance of becoming infected within the first 5 years of life

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## Routine Screening HIV

- Over 80% of the children with AIDS are under the age of 5 years, reflecting the predominant mode of vertical transmission, which currently accounts for 88% of HIV infections in children.

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## Routine Screening HIV

- According to the CDC, the term "Perinatal" encompasses prenatal, intrapartum and postpartum.
- Baseline transmission for vertical transmission varies according to geographic location with 25 to 30% in the US, 10 to 20% in Europe, and 40% in Africa

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## Routine Screening HIV

- HIV 1 is a member of the Lentivirinae subfamily of retroviruses
- Infection with HIV results in profound deficiencies in cell-mediated and humoral activity, with a progressive depletion of CD4 T cells
- Difficult to determine fetal infection because of procedure-related risks

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## Routine Screening HIV

- CDC definition of perinatally acquired infection in children:
  - < 15 months of age
  - Virus in blood or tissue
  - HIV antibody AND evidence of cellular and humoral immunodeficiency AND one or more categories of clinical symptomatic infection OR
  - CDC case definition of AIDS

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## Routine Screening HIV

- Prenatal Management
  - The maternal viral load is significantly associated with an increased risk for vertical transmission
  - The viral load is considered a reflection of the magnitude of HIV replication and its associated rate of CD4 lymphocyte destruction, and therefore the HIV induced immune damage

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## HIV

### Prenatal Management

- NIH goals for antiretroviral therapy
  - Introduction of effective antiretroviral therapy before extensive immune system damage has occurred
  - Viral load monitoring as tool to assess disease progression AND response to therapy
  - Combination therapy to reduce the risk of viral resistance to therapy
  - Patient adherence and compliance to monitoring and therapy

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## HIV

### Pregnancy Management

- Obtain consultation from infectious disease specialist
- Standard antiretroviral therapy in concordance with NIH guidelines
- Incorporate AZT chemoprophylaxis into antiretroviral regimen

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## HIV

### Pregnancy Management

- Combination antiretroviral therapy to maintain viral load to undetectable rates
- Regular interval checks for Cd4 counts and viral load to assess disease progression or response to therapy
- If viral load is zero, AZT prophylaxis still recommended

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## HIV

### Pregnancy Management

- Unless absolutely necessary, commence chemotherapy between 14 to 18 weeks gestation.
- Because the fetal effects are still not well established, serial monitoring for fetal growth and well-being are recommended.

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## HIV

### Labor Management

- Other obstetrical interventions such as amnio and external cephalic version should be carefully considered, because of the risk of feto-maternal hemorrhage
- C-section may reduce the risk of vertical transmission in women with no antepartum therapy or positive viral loads
- There is some evidence that avoiding scalp electrodes or delivery with less than 4 hours of ruptured membranes may reduce the risk of neonatal infection.

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## HIV

### Postpartum

- Neonatal AZT therapy
- Avoid breast-feeding

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## Protocol for AZT therapy

### ANTEPARTUM:

AZT 100mg po 5X/day between 14 to 34 weeks gestation

### INTRAPARTUM:

AZT IV LD 2mg/kg over 1 hour, then 1mg/k/hr until delivery

### POSTPARTUM:

AZT 2mg/kg po every 6 hours for first 6 weeks of life beginning 8 to 12 weeks after delivery

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## RUBELLA

- The risk of congenital rubella syndrome is 20% FOR PRIMARY INFECTION IN THE FIRST TRIMESTER. The risk ranged from 50% in the third month to 10%. Infection after 20 weeks gestation not a fetal issue.
- Cataracts, patent ductus arteriosus, and deafness are the most common abnormalities

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## Rubella

- Routine vaccine prophylaxis is available in the form of a live attenuated virus
- It is recommended that this vaccine be avoided within 3 months of conception and during the first trimester, however no cases of congenital syndrome in this circumstance have been reported
- Women who are noted to be IgG negative at the first prenatal visit should be immunized post-partum

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## Chlamydia

- Major newborn problems include inclusion conjunctivitis (ICN) and neonatal pneumonia
- Diagnosis of clinical infection in the infant signifies the presence of maternal infection. Thus the mother and her sexual partner should be treated

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## Chlamydia Prevention

- When the cervical infection rate is above 6%, the costs of treating the disease in these infants exceeds the costs involved in identifying and treating the pregnant women to prevent perinatal exposure
- Because infection rate of 15 to 30% are commonly reported in selected populations, routine screening should be initiated in these patients

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## Chlamydia Prevention

- Those patient found to be infected prenatally could be treated
- This is important as there are several reports of newborn prophylaxis failure
- Treatment options for chlamydia during pregnancy include macrolides and amoxicillin ( tetracycline is contraindicated).

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## Gonococcal Infection

- Risks to neonate include ophthalmia neonatorum and systemic neonatal sepsis
- Possible increased risk of preterm premature rupture of the membranes in retrospective studies

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## Gonococcal Infection

- Recommended Therapy
  - Ceftriaxone 125 mg IM once
  - Or
  - Cefexime 400 mg PO once plus
  - Erythromycin base 500 mg POQID x 7days

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## GROUP B STREP

- Major cause of bacterial sepsis among newborns
- Source of neonatal infection is the maternal birth canal
- Estimates of GBS colonization rates among pregnant women are 15 to 40%
- GBS is transmitted to 40 to 70% of newborns of colonized mothers
- However, only 1 to 2% of such infants develop disease

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## GBS Background

- Early neonatal disease
  - < 7 days of age
  - Higher rate of mortality
  - Septic shock
- Late neonatal disease
  - 7 days to 3 months of age
  - Lower rate of mortality
  - Meningitis

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## GBS Prevention

- Purpose of prevention specifically for early neonatal disease because of acuity of newborn disease and significant morbidity and mortality

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## GBS Risk factors

- Maternal age < 20 years
- Low socio-economic status
- \*Gestation < 37 weeks
- \*Prolonged rupture of membranes > 12 hours
- \*Maternal fever > 37.5 C
- \*GBS bacteruria
- Degree of maternal colonization (heavy versus light)
- \*Previous with GBS infection \* **Major Risk Factor**

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## GBS Colonization

- Relatively constant during pregnancy
- Less than 10% of women who are culture negative late in the second trimester are culture positive at delivery

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## GBS: Practice Recommendations

- Treat women intrapartum with major risk factors especially if culture status unknown
- All women with a previously affected child should receive intrapartum therapy in subsequent pregnancies
- Women with previous history of preterm delivery should have urine checked for GBS and treated at any point during the pregnancy

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## GBS General Screening

- All pregnant women should have recto-vaginal cultures obtained for GBS at 35 to 36 weeks
- All culture + women should be treated with intrapartum antibiotics or receive antibiotics with membrane rupture

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## GBS Intrapartum Therapy

- Penicillin G 5 million units every 6 hours until delivery
- Ampicillin 2 grams IV followed by 1 to 2 grams every 4 to 6 hours until after delivery
- IV Clindamycin 600 mg every 6 hours until delivery
- Newborn management depends on adequate intrapartum therapy and clinical status at delivery
- When in doubt about the newborn, have pediatrics assess at delivery with respect to further management.

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## GBS

- NO METHOD OF ANTEPARTUM OR INTRAPARTUM MANAGEMENT OR PROPHYLAXIS WILL PREVENT ALL GBS DEATHS
- RECENT NEONATAL INFECTIONS SECONDARY TO USE OF ANTIBIOTIC THERAPY

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