Neonatal Herpes Surveillance

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Herpes Simplex Virus

• Common in the United States
  – At least 50 million people in the US have a genital herpes simplex virus (HSV) infection.

• HSV-2 causes approximately 80% of all genital herpes cases in women
  – Around 1 in 4 women have a genital HSV-2 infection

• Neonatal herpes (nHSV) is the most serious sequelae of genital herpes
HSV in Pregnancy

- More potential for adverse outcomes with primary infection than first, non-primary (antibody to type 1, new acquisition type 2 and vice versa) or recurrent infections
  - Increased risk for preterm labor
  - Increased risk of HSV transmission to neonate
    - Larger quantities of virus replicating in genital tract
    - Extensive cervical involvement
    - Lack of maternal antibody
    - Infant may be immunologically immature
Neonatal Herpes Acquisition

- Frequency and severity of HSV recurrences may increase over the course of pregnancy
- Congenital and intrapartum transmission of nHSV have been described
  - Almost all cases of nHSV perinatally acquired
    - ~85% of nHSV infection acquired from exposure to HSV in birth canal
    - ~10% acquired through exposure to other sources of HSV
    - ~5% occur after transplacental infection
  - Infant acquires infection at time of delivery through contact with HSV-infected genital secretions
- Duration of ruptured membranes a risk factor for acquisition
Risk of Transmission

• Women who acquire genital herpes near time of delivery:
  – Risk of transmission to the neonate is 30-50%.

• Women with a history of recurrent herpes at term or who acquire HSV during the first half of pregnancy:
  – Risk of transmission < 1%.
Risk of Transmission

• Recurrent genital herpes much more likely than acquisition during late pregnancy.

• Therefore the proportion of nHSV infections from women with recurrent HSV is substantial.

• Up to 80% of nHSV cases are born to mothers without symptoms or a known history of genital herpes.
Neonatal Herpes

- Most develop signs of infection in second week of life

- 3 Forms
  - Skin, Eye and/or Mouth (SEM) Disease (~40%)
  - Central Nervous System (CNS) Disease (~35%)
  - Disseminated Disease (~25%)

- Associated with high morbidity and mortality even with treatment
Neonatal Herpes

Photo courtesy of Peggy Weinrub, MD
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Neonatal Herpes Prevention

• Prevent acquisition of genital HSV during late pregnancy

• Avoid exposure of the infant to herpetic lesions at delivery
  – Caesarian section
  – Universal, type-specific rapid diagnostic testing at delivery
  – Other, yet to be discovered/proposed method

• Type-specific serological testing at 34 weeks and, if positive, antiviral therapy at or beyond 36 weeks of gestational age.
CDC Guidelines

- All pregnant women should be asked about HSV history
- All women without known genital herpes should be counseled to avoid exposure to HSV
- Type specific serologic tests should be offered to women with genital herpes whose sex partner has HSV infection
- At onset of labor, all women should be carefully examined for herpetic lesions and symptoms of herpes

American College of Obstetricians and Gynecologists (ACOG) Guidelines

- All women should be asked in early pregnancy about history of herpes and symptoms
- All women with active genital herpes should be offered anti-viral therapy at or beyond 36 weeks of gestation
- Women should be examined for herpetic lesions when presenting for evaluation in labor or delivery
- Caesarean delivery is indicated in women with active genital lesions or prodromal symptoms near the time of delivery
California Guidelines

• Asymptomatic pregnant women with partners who have a known genital HSV-2 infection should be screened

• HIV-infected pregnant women should be offered HSV type-specific serologic testing

Current Neonatal Herpes Surveillance

• Currently reportable in 10 states – CT, DE, FL, LA, MA, NE, NY, OH, SD, WA
  – However, there is no standardized case definition

• In 2007, it was recommended by a CSTE/CDC working group that neonatal herpes be made a reportable condition in the United States.
  – Current working group in place to develop standardized case definition and reporting
Neonatal Herpes Estimates

• Varying estimates in incidence rates
  – Whitley et al.: 76.2/100,000 live births
  – Xu et al.: 12.9/100,000 live births
  – Dinh et al.: 4/100,000 live births

• In California,
  – Morris et al. used hospital discharge and mortality data
  – Incidence rate: 12.1 per 100,000 live births
  – Approximately 570,000 births per year in California
  – Estimated 70 cases per year
  – Range: 20-400 cases per year
Benefits of a Surveillance System

• Measure true burden of disease
  – Population estimates are currently limited
  – Rely on research studies
  – Hospital data

• Monitor trends
  – Effectiveness of intervention strategies on burden of disease
  – Measure impact of potential vaccine
Benefits of a Surveillance System

- Identify outbreaks/clusters
  - Cluster in NYC associated with ritual genital circumcision

- Identify high-risk populations
  - Allow for focused and more cost-effective prevention campaigns
  - Reduce unnecessary caesarian deliveries
Benefits of a Surveillance System

• Pursue case investigations
  – Ensure adequate treatment was provided
  – Identify missed opportunities in prevention
  – Estimates of disease are small
    • Would require limited resources for each county

• Link cases with expert care
  – University-based consultation
  – Optimize clinical management
References

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