

Mechanisms and Manifestations of Disease Lecture 2

Part 6
Alterations in Immunity: HIV
Transmission Considerations

African Americans and HIV

- 240,000-325,000 cases
- 1998-more African Americans with AIDS than any other group
 - ◆ ½ of all AIDS
 - ◆ 2/3 of all women
 - ◆ 2/3 of all pediatrics
- Of HIV infected-106,000 living with AIDS
- 63% of cases aged 13-24 (CDC, 1998)

African American Gender Differences in AIDS Etiology

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|--------------------------------|-----------------------------------|
| ■ 1 in 50 African American men | ■ 1 in 160 African American women |
| ◆ 38% MSM | ◆ 44% IVDA |
| ◆ 35% IVDA | ◆ 37% WSM |
| ◆ 7% MSW | |

HIV and IVDA

- Accounts for more than 36% AIDS in U.S.
- IN U.S. approx. 1 million IVDU
- 1998-48,269 new cases; 15,024 IVDA
 - >36%- Blacks and Hispanics; 22%- Whites
 - >Since 1984-59% of all female cases; 31%- men
 - >How-Direct IVDA, sex with IVDA, risky behaviors of non-IV DA (CDC, 2000)

HIV and Young Adults

- HIV-related illness and deaths greatest impact
- 25-44yr. old-leading cause of death
- African Americans-1 in 3 males; 1 in 5 females
- Infection rates peak mid to late twenties (CDC, 1/97)

HIV and WSW

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|---|---|
| ■ W-W transmission rare, but documented | ■ Risky Behaviors |
| ■ Vaginal and menstrual secretions infectious; oral transmission possible | ◆ Mucous membrane to vaginal secretions, esp. early and late stages |
| ■ Multiple partners | ◆ Sharing toys |
| ◆ Increased STDs | ◆ Lack of barriers- |
| | ◆ (CDC, 2000) |

Factors Affecting Efficiency of HIV Transmission

- Infectiousness of index case
- Number of CD4 cells, amount of plasma viremia-***Many antigenic variations of HIV!!***
- Lack of circumcision
- Cervical morphology
- Oral contraception
- Active STD

STDs and HIV

- Worldwide, 333 million new cases of STD/yr
- U.S.-epidemic-12 million new/yr.
- Spread of HIV parallels STDs
- South-highest syphilis, gonorrhea, HIV rates (CDC, 1998)

HIV and STD Transfer

- 2-5x more likely to become infected when STD present
 - ◆ Increased susceptibility through lesions for portal of entry. Increase # HIV target cells (CD4) in cervical secretions-inc. female susceptibility
 - ◆ Co-infection results in more viral shedding with greater concentration (CDC, 1998)

Perinatal HIV Transmission

- Early 1990's (before prevention)-1,000-2,000 HIV infected newborns
- Maternal-child transmission-91% of all AIDS cases in U.S.
 - ◆ 84% women of color
- Dramatic decline-1992-1998-75% decline
 - ◆ due to 1994-1995 recommendations for AZT during pregnancy and delivery, and post-natally
 - ◆ (CDC, 2000)

HIV Type 2

- Discovered (1986) in AIDS patients in West Africa; predominantly in Africa
- Likely present for decades
- Same transmission, opportunistic infections
- Slower, milder course
- Shorter infectious period
- Rare in children
- Since 1992, tested with HIV-1 in blood products (CDC, 2000)

Low Blood HIV Reduces Heterosexual Transmission

- 2.5 yr study following 400 heterosexual couples w/ 1 partner HIV+
- Conclusion-more virus individuals carried, more likely to infect partner
- Recommendations-Strategies to reduce viral load, even if not eradicated, to reduce spread. Especially significant for 3rd world (NIAID, 3/00).

Why Some Infected Don't Develop AIDS

- Small number of infected remain symptom-free long-term nonprogressors (LTNP)
- Migueles et al. of NIAID (3/00)-Studied 13 LTNP
- Found 11/13 had a gene encoding HLA variant, HLA B*5701 on T cells
- These T cells recognized HLA B*5701 when attached to certain HIV cell fragments
- **Conclusion- Immune property, not weakened virus, allows some LTNP to avoid disease**

TB and HIV

- Cause of death for 1 out of 3 PWA
- 1/3 of increase in TB cases over last 5 years due to HIV epidemic
- HIV infected 100 times greater risk of developing active TB and becoming infectious
- 10-15% all TB; 30% all cases in ages 25-44 occur in HIV-infected persons
- Surge of MDR TB (CDC, 2000)

Alterations in Immunity

- CC: 34 yo wf to ER c/o f, 12 lb wt loss over 1 mo., worsening 2 wk productive cough-brown
- HPI VS 101, 96, 24, 126/74, wheezing, CXR-NAD; TX-bronchitis; TB negative
- 2 weeks readmit s improvement-101.5, 120, 40, 138/84; 5lb wt loss; cough worsened
- CXR-diffuse interstitial infiltrates-all
- AFB
- ABG Po2 54, CO2 49, ph 7.30
- CBC-WNL, except WBC 4200; inc. serum lactate-400; low FE-28
- Admitted-R/O pneumonia, TB p 3 days AB w/o improvement, worsening D; AFB neg., BC-no growth. ID cons.-HIV work up+reactive ELISA and Western Blot. Bronchoalveolar lavage-P Carinii

Alterations in Immunity (cont.)

- PMH-1989-ER adm. For PID; 1991-childbirth; recurrent yeast infections-OTC; asthma; NKA; no drugs at present
- Family Hx-parents-mother 60-COPD; dad-58 controlled HTN; no siblings; daughter-3 yo; frequent colds, fussy poor appetite;
- developmental delays; walked 15 mos., less than 5th percentile for wt.
- Social-smoked 1-2 packs/16 yrs.; sep. from trucker husband after discovering truck stop affairs; left spouse after childbirth; no sex contact; no IV or blood prods.; nursing student works 30 hrs/wk.