

## Chapter 16 HIV/AIDS

1979

PCP-Pneumocystis jiroveci (carinii)-unusual pulmonary disease caused by fungus & primarily associated with people who have suppressed immune systems.

Kaposi' sarcoma (KS)-rare cancer of the skin & mucous membranes characterized by blue, red, or purple raised lesions seen mainly in Mediterranean men.

1986- renamed the virus & called it human immunodeficiency virus (HIV). Same year a second & distinctly different strain of the virus was discovered in Africa. Scientific names to distinguish between the 2 viruses are HIV-1 and HIV-2.

HIV is able to mutate rapidly (genetic promiscuity).

HIV-1 is found world wide, but is most prevalent in US & Europe.

HIV-2 is prevalent in western Africa & countries with historical or commercial ties to that region. HIV-2 appears to be less virulent (toxic)

**New Definition: includes all HIV-infected people who have CD4 counts of 200 cells/mm<sup>3</sup> or fewer (as opposed to the normal 600 to 1200 cells/mm<sup>3</sup>).**

African-Americans, Hispanics, & women continue to represent an increasing proportion of people with AIDS. The number of individuals in the older adult population is increasing steadily.

MSM (men who have sex with men)-still account for the largest # of individuals with HIV & AIDS.

New AIDS diagnoses among MSM are highest in the African-American population.

HIV/AIDS is a serious threat to people in all areas of the world, Africa is most @ risk. Africa is home to 70% of adults & 80% of the children living with HIV in the world.

Sexual transmission of HIV-most common mode of transmission.

Injecting drug users-second highest exposure.

All blood collected in US is now screened for 7 infectious agents: HIV-1, HIV-2, , etc. (page 775)

Risk of contracting HIV from blood transfusion is estimated to be 1 in 400,000.

Person is said to have seroconverted when there is development of detectable level of HIV antibodies.

ELISA-enzyme-linked immunosorbent assay-rapid enzyme immunochemical assay method to detect certain bacterial antigens & antibodies.

Western Blot- technique for analyzing small amounts of antibodies.

Seroconversion occurs in 95% of people within 3 months and 99% of people within 6 months of exposure to HIV.

Majority of occupationally acquired HIV infections have occurred through puncture wounds after a needle stick injury. Nurses then Lab employees.

### **PERINATAL(VERTICAL) TRANSMISSION**

HIV infection can be transmitted from mother to her infant during pregnancy, @ the time of delivery, or after birth, through breast feeding.

Factors such as the stage of maternal HIV disease (likely to be transmitted during the initial & later stages of infection, when more virus circulating in mother's blood & body

fluids), a decreased CD4 count or high viral load, presence or absence of STDs & nutritional status of mother play a role in vertical transmission.

Factors that increase risk of transmission during actual delivery are extreme prematurity; complicated pregnancies leading to extended labor; mixing of maternal & fetal blood; newborn ingestion of maternal blood; amniotic fluid, or vaginal secretions; skin excoriation in newborn; & being the first child born in multiple gestation.

ZDV, AZT, Retrovir therapy is started after the 14<sup>th</sup> week of gestation, given IV to the mother during delivery & including ZDV syrup given to infant after birth, reduces the risk of HIV transmission by 67%.

Long-term effects of ZDV or combination therapy are not known.

There are no legal requirements that a woman must take ZDV during pregnancy or that a woman must take ZDV during pregnancy or that she be tested for HIV antibodies.

Infants born to HIV infected mothers will have positive HIV antibodies results as long as 15 to 18 months after birth.

Population @ greatest risk is women. 50% of all new HIV infections occurring in the US each year are younger than 25.

## **PATHOPHYSIOLOGY**

Lentivirus-slow virus

HIV carries its genetic material in RNA rather in DNA.

Obligate virus-can't replicate unless it is inside another living cell. Hiv has attraction for cells that have CD4 molecules, such as T-helper lymphocytes, monocytes, & macrophages.

Initial infection with HIV results in a viremia during which large amounts of the virus can be isolated in the blood.

A prolonged period in which HIV is not readily detectable in the blood follows within a few weeks or months of the initial infection. This viral load falls as immune system responds & controls HIV infection & may last 10 to 12 years. During this period there are few clinical Sx. of HIV infection, although individual still capable of transmitting HIV to others.

HIV continues to replicate in the lymph tissues.

Immune dysfunction results from dysregulation & destruction of T-helper cells or CD4 lymphocytes-they recognize & defend against foreign invaders. An adult normally has 600-1200 CD4 lymphocytes.

2 phases of HIV disease:

- 1.) asymptomatic
- 2.) symptomatic

AIDS-end stage of continuum of HIV infection. Aids occurs when HIV-infected person has CD4 count of 200 or fewer. HIV infection may exist for years without Sx. before it progresses to symptomatic HIV disease-persistent unexplained fever, night sweats, diarrhea, wt. Loss, & fatigue.

## **AIDS**

Used to describe end-stage, or terminal phase of HIV infection.

As HIV progresses, ratio of T-helper cells to T-suppressor (normal 2-1), shifts resulting in more T-suppressor cells (CD8) than T-helper cells (CD4).

There may be decrease in WBC & reactivity to PPD is decreased or absent.

Anergic if no skin response is noted.

Without treatment, median time from an AIDS Dx. To death averages 1.3 years.

## **TESTING**

Blood tested with ELISA or EIA-antibody tests that detect presence of HIV antibodies. If EIA is positive for HIV, then same blood tested a second time. If second EIA positive, more specific test, Western Blot is done. Blood that is reactive or positive in all 3 steps is reported to be HIV positive.

As disease progresses, there is decrease in # of CD4 cells. The more significant the loss, the more severe immunosuppression becomes. Cd4 count best marker for immunodeficiency associated with HIV infection.

Not uncommon for pts. who are HIV positive to also be positive for Hep. B, because both infections are bloodborne & sexually transmitted. ¼ may be co-infected with Hep.C.

Hep. C is one of the most important causes of chronic liver disease & progresses more rapidly in HIV-infected people.

Therapeutic Management:

Monitoring HIV disease progression, preventing development of opportunistic diseases, etc.

Types of assistance may include family planning, treatment for substance abuse, treatment for STDs, treatment for TB, & immunizations.

Most difficult aspect of the medical management of HIV is dealing with the many opportunistic diseases that develop as the immune system degenerates.

There are 18 approved anti-HIV medications available & more in development.

Most effective medication regimen is the use of cocktails (@ least 2 or more compounds given together). Utilizing medication combinations makes it much more difficult for the virus to develop resistance to the drugs.

Medications should be given as close to time prescribed as possible, not just when pt. is awake. When medications are not given regularly, drug levels in blood fall low enough to allow HIV to develop resistance.

Treatment should be offered to individuals with fewer than 350 CD4.

## **NURSING INTERVENTIONS**

Treated in nonjudgmental, empathic, & caring manner regardless of their sexual practices or history of drug use.

Knowledge of HIV transmission & competence in standard precautions & body substance isolation will minimize the fear of caring for HIV-infected patients.

BOX 16-4 READ.

Important concept to remember with palliative care is that the goal is to relieve suffering through pain & Sx. management @ any point in patient's disease process.

Families & significant others of patients with end-stage HIV disease can experience disenfranchised grief- grief experienced when they incur a loss that is not openly acknowledged, publicly mourned, or socially supported.

They face uncertainty, isolation, fear, & depression.

The stigma of the disease is a major concern.

Nursing interventions should focus on a philosophy of facing life a day @ a time & living each day to the fullest extent possible by resolving multiple conflicts.

Pts. with HIV disease & depression should be assessed regularly for suicidal ideation.

CONFIDENTIALLY (PAGE 799).

Diarrhea is often a long-term problem for HIV- infected people.

Malnutrition, wt. Loss, & generalized wasting are common problems in pts. with HIV disease.

Malnutrition contributes to wasting, & wasting hastens the negative immune consequences of HIV infection.

### **NEUROLOGICAL COMPLICATIONS**

Aids Dementia- now called HIV-associated cognitive motor complex.

Complex combination of S&Sx including dementia;impaired motor function;& @ times behavioral changes that resemble an injury similar to stroke or head trauma.

Cognitive, motor, & behavioral dysfunction that slowly progresses over a period of weeks to months. Cognitive changes primarily involve a mental slowing & inattention.

Motor develop after cognitive impairment: poor balance & coordination (fallinf, tripping);slower hand activities & ultimately leg weakness that can limit ambulation.

Nurse should ensure safety and orientation cues such as clocks, calendars are present, hallways & living areas are brightly lit.

ADC(aids dementia complex) caused by HIV infection in the brain.

ADC can lead to coma.

Nsg. Interventions are focused on patient safety & caregiver support.

Peripheral neuropathy

Diseases that affect peripheral nervous system.

Can affect sensory, motor, or autonomic nerves.

Related to HIV disease or side effects of many anti-HIV medications.

SX: numbness in fingers, hands, & feet, & pain on walking and localized tingling.