

HIV infection in infants and children

By

Dr. Lindy Sampson, MD, FRCPC

Chief, Division of Infectious Diseases

Children's Hospital of Eastern Ontario, Ottawa, Ontario, Canada

Everyday 2000 children are newly infected with HIV around the world. By the end of 2002, over 13 million children are believed to have been orphaned by HIV. The greatest number of people living with HIV is in Sub-Saharan Africa where in four countries over 30% of adults are infected. Although it is commonly believed that HIV infection rates are rapidly increasing to endemic proportions in parts of Asia and Eastern Europe, official statistics from these areas are not felt to be reflective of the true rates. In areas of the world where HIV is felt to be endemic, it is transmitted predominantly in the heterosexual population and rates are often highest in women of childbearing age. In Canada, the HIV infection rate in the general population is less than one percent; however amongst certain populations these rates are much higher.

How do infants and children become infected with HIV?

The most common way for infants and children to become infected is when the virus is passed from mother to child *in utero*, at the time of delivery or during breast feeding. If a baby is born to an HIV positive woman, several studies have demonstrated that without any interventions, the baby has a 20-40% chance of becoming infected. These rates vary depending on where in the world the studies were performed. The chances of the baby becoming infected are increased by certain factors related to the woman herself, the type of delivery and likely also some factors related to the baby as well. The amount of virus circulating in the mother's blood, her degree of immune system dysfunction and her nutritional status are all important. The type of delivery, vaginal versus caesarean and whether or not there are complications at the time of birth also play a role. If an HIV infected pregnant woman takes anti-HIV medications during her pregnancy and delivery and the baby is given anti-HIV medications for the first 6 weeks of life, the chances of the baby becoming infected with the virus can be dramatically reduced to < 5%. The babies' chances of becoming infected can also be decreased if they are not breast fed. This is only recommended in areas of the world where there is safe access to infant formula.

HIV can also be transmitted via blood products in areas of the world where the blood supply is still not routinely screened for HIV. Canada has been testing its blood supply since 1985. Children can also become infected with HIV from contaminated medical equipment such as syringes that are re-used without appropriate sterilization as well as rarely by sexual abuse by an infected individual. HIV is not transmitted through routine household contact (hugs and kisses, sharing eating utensils), saliva or contaminated toys.

How is HIV diagnosed in infants and children born to HIV positive women?

In children over the age of 18 months

In adults and children over the age of 18 months, HIV can be diagnosed by detecting proteins (or antibodies) made as part of the body's immunologic response to the virus. This is usually called an HIV ELISA test. It usually becomes positive within three weeks of being infected. In Canada, the laboratory gets a positive result to the first ELISA test, they automatically repeat the test two more times on the same blood. If either of these is positive again, then they perform a second more sensitive test to look for other HIV antibodies called the Western Blot. All of these tests are done before a test result is sent back to the ordering physician. If the final test is positive then the result is reported as positive. Because there are four stages to the testing, HIV test results are very accurate and it is very rare for there to be a falsely positive or negative result. If someone over the age of 18 months receives a positive test result, it should always be repeated though, just to make sure that there was not a mix-up of blood in the lab.

In children less than 18 months of age

In newborn infants and children less than 18 months of age, one cannot rely only on the presence of antibodies in the blood to make the diagnosis of HIV infection. This is because when a baby is in the mother's womb, proteins can pass from the mother's blood to the baby. These proteins include antibodies against many different types of infections. In fact, these antibodies against other infections that are passed from mother to child help protect the baby from getting sick in the first few months of life. Every baby born to an HIV positive woman will therefore test positive on the ELISA or antibody test for the first 18 months of life whether or not they are actually infected themselves. All that this result tells you is that the mother is HIV positive. In order to figure out if a baby is infected with HIV then, a more sophisticated test looking for the genetic material of the HIV virus itself (HIV PCR) or an attempt to actually grow the virus from the blood (HIV viral culture) must be done. An infant born to an HIV positive woman must have two negative HIV PCR tests done after one month of age to be able to say that the child is not infected. If the PCR or culture test is positive then it should be repeated immediately and it is very likely that the baby has contracted the infection.

Symptoms of HIV infection in young children

Some babies (about 1/3) who are born with HIV infection can have absolutely no symptoms for several years. About 1/3 of infected children though, will become very sick in the first year of life without treatment. These babies often have difficulty growing, can have developmental delays, recurrent yeast infections (thrush) and an unusual form of pneumonia called PCP which can be life threatening. The final 1/3 of children born with HIV infection usually start to develop symptoms after the first few years of life. These symptoms can include such things as developmental delays, growth and learning difficulties, recurrent infections, chronic cough or diarrhea, thrush and chronically swollen glands. It is important to remember though that other things can also cause many of the symptoms that babies with HIV infection get. It is therefore important to have a child with these symptoms checked thoroughly to determine the true cause.

How do children living with HIV infection do today?

HIV is now often viewed as a chronic illness rather than an acute life-threatening one. Most children who are born with HIV infection are expected to live well into their adult years if they are diagnosed early in life and have access to anti-HIV medications when needed. More importantly, they are able to fully participate in all the usual childhood activities including school, extra-curricular activities and sports.

All children living with HIV infection require close medical, developmental and nutritional monitoring at a medical center that is experienced in treating children with HIV. All of these children require treatment with anti-HIV medications once their immune systems show signs of weakening. For children diagnosed after their second birthday the length of time it takes to weaken the immune system varies. Every child who is diagnosed with HIV infection in the first two years of life though, is put on medication immediately to try and bring the virus under control before it can do any damage to the maturing immune system. Once started, these medications must be taken consistently to keep the virus under control. While most children tolerate the medications well, there are potential side effects that must be monitored for regularly. These medications do not stop a child from going to school or participating in any childhood activities.

Does anything special need to be done to HIV negative children born to women who have HIV infection?

Babies born to HIV positive women who turn out not to become infected themselves do not have a higher risk of physical differences or abnormalities at birth. There are several studies which are following these children over many years to see if they are at risk of developing any other illnesses or problems. To date, they have not found any definite problems however it is possible that some may arise as these children grow older. Many of these children were exposed not only to the HIV infection in the womb but also to anti-HIV medications to try and prevent the virus from being passed on. It is also possible that exposure to these medications in the womb could have some longterm side effects. In Canada, all children born to HIV positive women are followed closely over the first two years of life and then yearly after that to see if they develop any problems.

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