HIV testing

Introduction

Testing of children for HIV infection should only be done after the parents / primary caregivers have been informed and verbal consent obtained. Appropriate post-test counselling is essential. Counselling is the responsibility of the attending clinician with or without the assistance of trained lay counsellors. HIV testing is summarised in the accompanying algorithm.

Definitions

HIV exposure: Any child <18 months of age born to an HIV-infected mother, or who has tested HIV antibody positive is regarded as being HIV-exposed. A child of any age who is receiving breastmilk feeds from an HIV-infected mother is regarded as being HIV-exposed up until six weeks after the last breastfeed.

HIV infection:

A child <18 months old with a positive HIV DNA PCR result should be regarded as being HIV-infected. The baseline viral load done before antiretroviral therapy is started is used to confirm the HIV DNA PCR result. A baseline viral load of ≥ 10,000 copies/ml confirms the positive HIV DNA PCR result.

There is generally very high concordance between the HIV DNA PCR and baseline viral load results. Very rarely a false positive HIV DNA PCR is identified when the positive HIV DNA PCR result is not confirmed by baseline viral load testing i.e. the baseline viral load is < 10,000 copies/ml. A child with discordant results i.e. positive HIV DNA PCR and viral load < 10,000 copies/ml may require further testing.

A child >18 months old: 2 positive serological test results (HIV Rapid test and / or HIV ELISA) confirm HIV infection. A negative confirmatory antibody test in a child more than 18 months old with a previous single positive antibody test result implies discordant test results necessitating further testing. Discordant results should be discussed with an experienced clinician or virologist.

Who should be tested?

The World Health Organization recommends that all children (from the age of 4 - 6 weeks) in settings where local or national antenatal HIV seroprevalence is > 1% should be offered maternal or infant HIV antibody testing and counselling in order to establish HIV exposure status. Because of very high seroprevalence rates the HIV status of all South African infants & children should be established.

Box: Establishing HIV status at the hospital

At Red Cross War Memorial Children's Hospital, despite the high clinical service load, every effort should be made to establish the HIV status of all children seen in the outpatient department and admitted to the medical and surgical wards. In busy situations priority should be given to the following
patient categories:

- All infants whose mothers were not tested for HIV during pregnancy or who were not enrolled on the PMTCT programme.
- Children diagnosed with **TB or suspected to have TB**, because TB is often the sentinel disease with which an HIV-infected child presents to the health care worker (and because other conditions may mimic TB if child is HIV-infected).
- Children with **malnutrition**
- Infants & children with **suspected symptomatic HIV infection** including those who were previously regarded as not HIV-exposed
- **Sexually-abused children**

**When should HIV testing be done?**

HIV antibody testing (rapid test or ELISA) is reliable at any age. Optimal sensitivity and specificity of the HIV DNA PCR test is reached by the age of 4 - 6 weeks. For that reason, PCR testing is generally advised from the age of 4 - 6 weeks. However, **HIV-exposed children aged less than 4 weeks of age with clinical features suggestive of HIV infection should be PCR-tested**. A negative HIV DNA PCR test result in these infants does not exclude infection. Instead HIV DNA PCR testing should be repeated once the child reaches the age of 4 - 6 weeks. If the HIV DNA PCR result is positive the child should be managed for HIV infection and the positive HIV DNA PCR result confirmed with the baseline viral load result (refer above). If the baseline viral load result is < 10,000 copies/ml the HIV diagnosis and management should be reviewed by an experienced clinician.

**Approach to HIV testing**

1. **Establish whether the child was previously tested**

Before requesting HIV testing in children aged 6 weeks or older, check with the department of Virology, Groote Schuur Hospital whether the child was previously tested especially in the context of the PMTCT programme. **The Virology Department may be contacted using the following telephone numbers:** 021-4043382 or 021-4044129, or via the tie line: 6058. This will ensure optimal utilisation of resources and prevent unnecessary repeat testing.

2. **Counselling**

Determining the HIV status of young children should be prioritised, particularly those who are admitted to hospital.

It is the responsibility of the clinician taking the blood for HIV testing to ensure that the parent or caregiver receives counselling and informed consent is obtained. Where possible both parents should participate in the consent process. The time between testing and informing parent(s) / caregivers of the test outcome should be kept to a minimum.

Where necessary, pre-test counselling should provide general information about HIV infection and the testing procedure. Pre-test counselling can be completed by the clinician managing the child and does not usually require the involvement of trained lay counsellors unless the parent or caregiver requests further discussion. Post-test counselling should discuss the implications of the test result in greater detail, and provide appropriate emotional support and it is frequently beneficial to involve trained lay counsellors.

**Checklist of issues to be covered during counselling**
Pre-test counselling

- The main purpose of pre-test counselling is to provide sufficient information to be able to take informed consent. This usually requires a brief discussion with the parents / primary caregivers and may include the following information:
  - What is HIV and what is AIDS?
  - How does HIV affect the body?
  - Transmission of HIV in children, adolescents & adults
  - HIV tests, testing procedure and time lines

Post-test counselling

- Post-test counselling should not be initiated on a rapid test result alone in children less than 18 months of age. Await the HIV DNA PCR result
  - Empathy and containment of emotions after informing person(s) of the test result
  - Understanding the implications of the result of the test and whether further tests are needed
  - Reinforce or discuss appropriate infant feeding practice
  - The significance of the result for the health of the child, and parent where relevant
  - The ability of the caregiver to cope with the implications of the test result
  - Treatment of HIV infection and AIDS, if appropriate
  - The dangers of spreading the disease, if the result is positive, and the need for self-protective sexual practice if the result is negative
  - Stigma and disclosure of HIV status
  - Follow up arrangements

3. Consent for HIV testing

According to the Children’s Act²:

- Children <12 years of age (unless they are of sufficient maturity to understand the benefits, risks, and social implications of the test results themselves) require the consent of their parent or primary caregiver (i.e. does not have to be legal guardian, but the person who cares for the child) but **all children should be provided with age-appropriate information prior to HIV testing**.
  - Children ≥12 years of age can provide consent to be tested; they must also provide written consent if disclosure of their test result to anyone else is necessary.
  - Whoever consents must receive pre and post test counselling.

In the absence of caregiver consent, the MEC for Social Services may be approached to give consent. **The approach should be made via a hospital Social Worker.** The High Court may also be approached for consent. However, it is seldom necessary or appropriate to approach the High Court to provide authorisation for treatment without consent. This option only arises when a dispute occurs between the legal guardians and medical attendants regarding treatment - and then only where such treatment is considered by the latter party to be lifesaving.

4. Establishing HIV exposure status

4.1 Infants of mothers who participated in the PMTCT intervention programme:

An infant born to a mother who tested HIV antibody positive before or during pregnancy, or during the breastfeeding period is regarded as HIV-exposed.

An infant born to a mother who tested HIV-negative before or during pregnancy, or during breastfeeding is not-HIV-exposed although it is important to realise that a mother who tests HIV-negative during pregnancy may be in the window period of HIV infection or may become HIV-infected later during pregnancy or the period of breastfeeding and repeat HIV antibody screening of these mothers and their infants is best practice.

4.2 Infants who did not participate in the PMTCT programme

To establish the HIV exposure status in an infant or child with unknown HIV status, a rapid test is performed. A positive rapid test indicates that the child is HIV-exposed. A negative rapid test indicates that the child is not HIV-exposed.
5. Confirming HIV infection in HIV-exposed infants & children

In HIV-exposed infants and children the diagnosis of HIV infection should be confirmed by performing confirmatory HIV tests i.e. an HIV DNA PCR test and viral load < 18 months old or a second antibody test (rapid test or ELISA) in children > 18 months of age.

6. Testing during and after Breastfeeding

A breastfed infant born to an HIV-positive mother should be tested by HIV DNA PCR at 4 - 6 weeks in accordance with the national PMTCT programme. The infant should be retested at any stage during the breastfeeding period if he/she develops clinical features suggestive of HIV infection. In addition, repeat HIV testing is recommended 6 or more weeks after complete cessation of breastfeeding, irrespective of the presence or absence of clinical features suggestive of HIV infection.

A breastfed infant born to an HIV-positive mother who tests HIV DNA PCR positive at any age should be regarded as HIV-infected. Confirmatory viral load testing before commencing antiretroviral therapy should be done.

7. HIV testing procedure at Red Cross Children’s Hospital

In accordance with the testing algorithm, all children with unknown HIV exposure status should be screened for HIV exposure using the Determine™ HIV rapid test. The HIV ELISA test should not be used to screen children for HIV exposure.

Rapid testing should be done at the NHLS Haematology Laboratory, Red Cross Children’s Hospital. The advantages of screening for HIV exposure with the Determine™ rapid test at the NHLS laboratory include: (1) Accuracy of the test result is comparable to an HIV ELISA result, (2) The cost of a Determine™ rapid test is approximately 2.6 times lower than the cost of a HIV ELISA test, (3) Test results should be available within a few hours of sending the blood sample, (4) Rapid test results will be archived in the NHLS electronic database, may be retrieved at any time from the database, and the result may be printed for placement in the patient folder, and (5) the NHLS provides a 24-hour continuous testing service.

For children with unknown HIV status (including HIV-exposed children i.e. children <18 months of age or breastfeeding children whose mothers have previously tested HIV positive) and those with unknown HIV exposure status), two purple-top (EDTA) microcontainers, each containing 500 microlitres of blood should be sent to the laboratory. Alternatively, the child may be sent to the NHLS laboratory reception area in the ICH building with a request form, where a finger prick blood sample will be drawn for HIV testing. On the NHLS request form, the ‘HIV serology’ box (under Virology & HIV testing) should be ticked. This will result in the Determine™ rapid test being performed and if positive, without further request or repeat blood-taking a PCR test (if the child is < 18 months old) or an HIV ELISA test (if the child is > 18 months old) will be done on the second sample. The sample will be forwarded to the Virology Laboratory at Groote Schuur Hospital. If the Determine™ rapid test is negative, no further tests will be done on the sample. It is important to realise that from approximately 6-9 months of age, HIV-exposed infants may test negative on HIV antibody tests (including rapid tests) as a result of disappearance of maternal antibodies (a process known as seroreversion). These infants are HIV-negative and do not require additional PCR testing to confirm that they are HIV negative (unless there is ongoing breastfeeding).

All HIV test results should be clearly documented in the results sheet of the child’s folder.

References

**Figure 3.1: HIV testing algorithm**

**Child with unknown HIV status**

- **<18 mths of age**
  - Pretest counsel caregiver & obtain consent for HIV testing
  - Do Abbott Determine® rapid test on child
    - If mother is known to be HIV-infected & child is <9 mths of age, skip rapid test & proceed directly to PCR test
    - Rapid test is positive
      - Do HIV DNA PCR test on child
        - Start co-trimoxazole prophylaxis if ≥6 wks of age
        - Arrange follow-up date for test results
        - PCR test is negative (≥6 wks of age)
          - Child is breastfeeding
            - Continue co-trimoxazole
              - Repeat HIV testing according to this algorithm ≥6 wks after stopping breastfeeding or if child develops clinical features of HIV infection during period of breastfeeding
          - NO breastfeeding in last 6 weeks
            - Child is HIV-uninfected
              - Repeat HIV testing according to this algorithm ≥6 wks after stopping breastfeeding or if child develops clinical features of HIV infection during period of breastfeeding
        - PCR test is positive
          - Child is HIV-infected
            - Post test counsel caregiver
              - Manage further or refer to HIV clinic
              - Encourage HIV testing for parents & siblings
            - Pos test counsel caregiver &/or child
              - Manage further or refer to HIV clinic
              - Encourage HIV testing for parents & siblings
    - Rapid test is negative
      - Do Abbott Determine® rapid test on child
        - ≥18 mths of age
          - Pretest counsel caregiver and/or child & obtain consent for HIV testing
            - Children >12 yrs of age can consent for their own testing
          - Do Abbott Determine® rapid test on child
            - Rapid test is positive
              - Do confirmatory HIV ELISA test on child
                - Start co-trimoxazole prophylaxis
                - Arrange follow-up date for test results
                - Positive rapid test & ELISA test
                  - Child is HIV-infected
                    - Post test counsel caregiver &/or child
                      - Manage further or refer to HIV clinic
                      - Encourage HIV testing for parents & siblings
            - Rapid test is negative
              - NO breastfeeding in last 6 weeks
                - Child is HIV-uninfected
                  - Post test counsel caregiver &/or child
                    - Manage further or refer to HIV clinic
                    - Encourage HIV testing for parents & siblings