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HIV and TB in Practice for nurses: Pregnancy and TB/HIV

By Lesley Odendal

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Why is TB important in pregnant women living with HIV?

Tuberculosis (TB) should be given special attention during pregnancy (particularly in women with HIV) to keep both mother and baby healthy. Pregnant women with un-treated TB are likely to have poor obstetric and perinatal outcomes. TB is the cause of death during pregnancy for somewhere between one in six and one in sixteen women, and pregnant women living with HIV are at especially high risk of dying due to TB.¹

TB in a pregnant woman also increases the risk that babies will be born prematurely or with a low birth weight. TB during pregnancy is also associated with an increase in perinatal deaths. Among pregnant women with TB, there is also an increased risk that the baby will be infected with TB before and after birth, and of developing active TB. When a pregnant woman is co-infected with HIV, TB doubles the risk of vertical transmission of HIV to the unborn child.

TB has also had severe effects on families: in 2009, more than 10 million children were orphaned because of TB-related deaths among their parents.

However, TB is both preventable and curable in pregnant woman and their children, regardless of their HIV status. The *Three I's for TB/HIV* (Intensified Case-Finding, Infection Control and Isoniazid Preventive Therapy) and earlier antiretroviral therapy (ART) significantly reduce the risk of TB among people living with HIV (PLHIV). It is important for nurses to know the links between pregnancy and TB and TB/HIV. More needs to be done to incorporate TB/HIV services into maternal and child health (MCH) services. This edition of HATIP for nurses explains how to prevent and treat TB in pregnant women to protect both mother and child.

The risk of TB in pregnant women

Some studies, but not all, suggest that pregnant women living with HIV and those who have given birth in the past six months are more likely to develop active TB.² There are other risk factors for pregnant women to develop TB such as living in an area where TB is endemic, having been in close contact with a person with active TB disease or being immunosuppressed due to factors such as HIV infection or treatment with immunosuppressive medication.

TB in pregnant women living with HIV

HIV-positive pregnant women have a tenfold higher risk of TB compared with HIV-uninfected pregnant women.³ HIV suppresses a

person's immune system, increasing their risk of developing active TB.

Having both TB and HIV (also known as co-infection) increases a woman's risk of death from TB. Pregnant women living with HIV who have TB are three times more likely to die than women who only have TB and not HIV.⁴

Vertical transmission of TB

Mother-to-child transmission of TB disease may occur before the infant is born, in the uterus (*in utero*), by spreading through the blood in the umbilical cord or by swallowing infected fluids. During childbirth, TB disease may also be spread from mother to infant through contact with fluids or genital secretions. One study found that almost one-in-seven infants born to mothers with TB already had evidence of TB infection by the time they were three weeks old, suggesting that they had been infected in the womb or at the time of birth.⁵

An infant is also at high risk of TB infection after the birth if the mother has active TB disease, through the spread of TB in the air. The risk of infection through breastfeeding is very small. Whether an infant is being breastfed or formula-fed, there is a high risk of contracting TB if the mother has active TB. During feeding of an infant, a mother and her child are in very close contact which increases the risk of airborne transmission. A mother taking first-line TB treatment who is breastfeeding her infant, will not have high enough levels of TB drugs in her breast milk to cause side-effects to the infant.

Impact of maternal TB on the infant

There are several negative effects for infants who are born to mothers with TB disease, such as the risk of being born prematurely or with a low birth weight or being infected with TB. Maternal TB is also associated with a 6-fold increase in perinatal deaths.⁶

Vertical transmission of HIV in women with TB and HIV

When a pregnant woman develops TB, it is important to think about the possible risk of increased HIV transmission to the infant. A woman living with HIV, who also has TB disease, has twice the risk of vertical transmission of HIV to the unborn child, compared to HIV-positive pregnant women without TB.⁷ One small study in HIV-positive pregnant women with TB found that almost one in five passed on HIV to their infant in the womb, prior to delivery and breastfeeding.⁸ In order to reduce the risks of HIV transmission, it is important to prevent TB, diagnose and promptly treat the disease in pregnant women.

Test for HIV in any pregnant woman with TB

WHO recommends provider-initiated HIV counselling and testing for anyone diagnosed with TB. This is especially important when TB is diagnosed in a pregnant woman.

Screening and diagnosis of TB in pregnant women living with HIV

WHO recommends using the four-symptom screen in people living with HIV, including pregnant women, namely:

- current cough
- fever

- night sweats
- unexplained weight loss (or poor weight gain during pregnancy)

Ask the pregnant woman if she has been experiencing any of the above symptoms. This must be done at the pregnant women's first visit to MCH services and at every other visit to healthcare services, as the woman can develop TB at any time during her pregnancy. If these symptoms are being experienced, sputum should be collected and tested by Xpert MTB/RIF as initial test (if available) or smear microscopy for TB diagnosis. Positive or negative diagnostic test results may require repeat test or further testing with culture, drug susceptibility testing and further clinical investigation.

Diagnosing TB in pregnancy may be challenging as many of the symptoms of TB may be masked by the symptoms of pregnancy such as being tired. The weight loss from TB may not be noticeable because of the weight gain from pregnancy. Despite this, TB presents itself in pregnant women the same way as in women who are not pregnant. TB of the lungs (pulmonary TB) is the most common form of TB in pregnant women.

TB can present differently in women who are living with HIV, whether they are pregnant or not:

- Smear-negative pulmonary TB is common in HIV-infected pregnant women as they tend to produce fewer bacilli and smear microscopy alone has limitations for diagnosing this form of TB. Therefore, more sensitive diagnostic tools, such as Xpert MTB/RIF or culture, should be used for diagnosis when possible.
- Chest X-rays may assist in screening for TB in addition to symptom screening. However, chest X-rays should be used with caution in pregnant women because of the risk of radiation exposure to the foetus and are not recommended before 6 months of pregnancy due to the high risk of radiation exposure for the foetus. Chest X-rays can be used only when effective protection measures are provided.
- TB outside of the lungs (extrapulmonary TB) is common in pregnancy, and nurses should have a high suspicion of extrapulmonary TB in pregnant women with atypical symptoms of TB such as swollen lymph nodes.

Prevention of TB in pregnant women living with HIV: IPT and antiretroviral therapy

Isoniazid Preventive Therapy (IPT) in pregnant women

WHO recommends offering at least six months of IPT to any adolescent or adult living with HIV who is negative on the symptom screen, including pregnant women.⁹

The symptom screen is not a very precise tool for identifying TB cases, but a patient who does not have any of the four symptoms is highly unlikely to have active TB, and could be given IPT without having to worry about undertreating an active case of TB.

However, a few cases of active TB could slip through anyway, so WHO recommends that the symptom screen should be performed any time a person living with HIV has any interaction with the health system, such as when they come back to the clinic to collect the next month's supply of medicine. This reduces even further the likelihood that a person with active TB takes only isoniazid for a prolonged period.

The importance of antiretroviral therapy (ART) to prevent TB among pregnant women living with HIV

ART is especially important in pregnant women living with HIV. Not only does ART prevent the transmission of HIV from mother to

child, but it also prevents TB in both the mother and the infant, regardless of the CD4 count of the mother. HIV treatment reduces the risk of developing active TB by almost two-thirds in people with higher CD4 counts (above 350), and by 84% in the people at highest risk with advanced HIV disease (CD4 counts below 200).¹⁰ The combination of ART and isoniazid preventive therapy (IPT) is more effective at preventing TB than ART or IPT alone.¹¹

ART also reduces mortality among HIV-positive TB patients who are on TB treatment. Earlier ART during the intensive phase of TB treatment improves survival and other outcomes. If HIV is very advanced – with CD4 cell counts below 50 – ART should be initiated as soon as possible within the first two weeks of starting TB treatment (see [HATIP Issue 199](#)). The earlier ART is started in the mother, the better the health outcomes for the infant, as well as decreasing the risk of transmission of HIV from mother to child.

Issues related to treatment of active TB in pregnant women living with HIV

Treatment for TB is the same for pregnant women and women who are not pregnant, with the only exception that in second-line treatment streptomycin should be avoided in pregnancy due to the risk of ototoxicity (harmful effects on the organs or nerves concerned with hearing and balance) on the foetus.¹²

Treating pregnant women with both HIV and TB can be challenging, mostly due to drug interactions of the medications needed for both diseases. Rifampicin may reduce the concentrations of commonly used antiretrovirals, especially non-nucleoside reverse transcriptase inhibitors (NNRTIs) and protease inhibitors. With NNRTIs, studies have found decreased levels of nevirapine in individuals also taking rifampicin-based TB treatment. Efavirenz levels at standard doses remain largely unaffected by rifampicin and so it is the preferred NNRTI. Although there were concerns regarding efavirenz use within the first trimester of pregnancy, the WHO guidelines no longer recommend against the use of efavirenz during the first trimester, due to the lack of evidence of an excess of birth abnormalities in infants exposed to efavirenz.¹³

Rifampicin also causes a more than 80% reduction in the levels of protease inhibitors, and there have been reports of liver toxicity in individuals already taking rifampicin prior to the initiation of a boosted protease inhibitor-based regimen. The recommendation is to monitor liver function. An alternative is to use rifabutin for the treatment of TB, as this may decrease the risk of drug interactions with antiretroviral drugs (although rifabutin should not be taken with protease inhibitors). However, rifabutin is expensive and difficult to access.

Diagnosis, treatment and prevention of TB in neonates/infants

The diagnosis of TB in a newborn may be very challenging as there are often no obvious symptoms. If a mother has active TB, it is important to look out for TB in the infant. Symptoms will usually show in the infant during the second or third week of life. For diagnosis, a rapid diagnostic test, such as Xpert MTB/RIF, or culture test for TB must be conducted from the tissues or fluids of the infant. If active disease is diagnosed, full TB treatment must be given to the infant, made up of the following for two months:

- Isoniazid: 10 mg/kg/day (range 7-15 mg/kg)
- Rifampicin: 15 mg/kg/day (range 10-20 mg/kg);

- Pyrazinamide: 35 mg/kg/day (range 30-40 mg/kg)
- Ethambutol: 20 mg/kg/day (range 15-25 mg/kg)

Isoniazid and rifampicin should be continued for a further four months.¹⁴

If there is no evidence of active disease, prophylaxis in the form of isoniazid preventive therapy (IPT) should be given to the infant. The recommended dose of isoniazid for preventive therapy is 10 mg/kg/daily for six months.

Integration of TB/HIV services into MCH services

Given the links between pregnancy and TB and HIV, it is essential that TB/HIV services are integrated into maternal and child health (MCH) services at facility level to improve the health outcomes for both mothers and infants. Antenatal and prevention of mother-to-child transmission (PMTCT) programmes are an important first contact to health services for pregnant women. MCH services provide an excellent opportunity to detect and treat TB in pregnant women and their infants. This is particularly important for pregnant women with HIV who are at greatest risk of developing TB and transmitting TB or HIV to their infants.

Women have to go through a series of referrals for the diagnosis and treatment of TB in pregnancy, beginning with triage at the antenatal clinic as the nurse screens for TB symptoms. If symptomatic, the pregnant woman is usually referred to the TB clinic for further TB investigation. Once TB is diagnosed, the woman is usually referred back to the TB clinic to receive TB treatment. This referral system can become even more complicated if the client has HIV and TB/HIV services are not integrated. The process is more convenient if the antenatal, TB and HIV services are provided in the same facility. This is why it is important for staff in these services to work together to identify the best ways in which processes can be simplified, and to prevent women from being lost to follow-up.

Additional resources

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