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Human T-lymphotropic virus type 1

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Key facts

- **Human T-lymphotropic virus type 1 (HTLV-1) is a retrovirus which causes a chronic lifelong infection in humans.**
- **HTLV-1 is primarily transmitted through breast feeding, sexual contact and, needle sharing and unsafe blood transfusion.**
- **The commonest clinical presentations including general immunosuppression making individuals more susceptible to infections, uveitis, dermatitis, pneumonitis, adult T-cell leukemia, and HTLV-1 associated myelopathy also known as tropical spastic paraparesis.**
- **The current estimates for the total number of people living with HTLV-1 infection ranged from 5 million to 10 million in 2012.**
- **It affects more women than men, though the reasons for this are not well understood.**
- **There is no effective treatment for HTLV-1 and emphasis is placed on detection and prevention.**

Overview

Human T-lymphotropic virus type 1 (HTLV-1) is a retrovirus, similar to HIV, which causes a chronic lifelong infection in humans. Its transmission happens through breast feeding, sexual contact, needle sharing and unsafe blood transfusions. It causes a range of clinical manifestations including poor functioning immune system (immunosuppression),

inflammation of the eye (uveitis) and skin (dermatitis), and pneumonia (pneumonitis). HTLV-1 may lead to cancer in some people (adult T-cell leukemia) and various neurological complications such as myelopathy (HTLV-1 associated myelopathy) and spastic paraparesis.

Transmission

HTLV-1 is primarily transmitted through breast feeding, sexual contact, needle sharing and unsafe blood transfusion. Mother-to-infant transmission occurs primarily through breastfeeding at a rate of around 20–30%, with shorter durations of breastfeeding associated with lower rates of transmission.

Women are more frequently affected by HTLV than men for reasons that are not well-understood. This might reflect higher efficiency of male to female transmission but could also be due to other biological factors. HTLV-1 has been detected in cervical secretions and semen, but higher lymphocyte counts may be present in the semen enhancing transmission.

Transfusion of cellular blood products from a person with HTLV-1 infection carries a high risk of transmission, as does solid organ transplantation. However, transfusion of cell-free plasma carries a low or no risk of transmission. Also, needle sharing in the context of intravenous drug use is an important mode of transmission.

HTLV can be transmitted through needle sharing, which poses a significant risk for spreading the infection. Sharing needles is a common route of transmission for HTLV, especially among intravenous drug users. To reduce the risk of HTLV transmission, it is crucial to avoid sharing needles and practice safe injection practices.

Diagnosis

Diagnosing HTLV-1 can be challenging due to the length of time between contracting the virus and the appearance of detectable antibodies. The diagnosis of HTLV infection is usually made by testing for HTLV antibodies in blood samples using enzyme-linked immunoassay. No single test can provide a definitive HTLV diagnosis. A combination of tests is needed. The second test may detect antibodies to different HTLV proteins (for example, western blotting and line immunoassay) or may detect proviral DNA integrated into the host cell genome (using polymerase chain reaction (PCR)). This combined approach is important to confirm HTLV infection. NAT detects or quantifies HTLV-1 proviral DNA integrated into the host cell genome. Cell free virus is rarely found in plasma of people living with the virus. Therefore, detection of HTLV-1 RNA is not used for diagnostics.

Symptoms and complications

Most people with HTLV-1 infection do not have symptoms. About 5–10% of people with HTLV-1 will develop a recognized associated clinical condition. Early clinical manifestations may be uveitis, dermatitis and pneumonitis.

HTLV-1 can cause a form of blood cancer called adult T-cell leukemia or lymphoma. People may present with lymphadenopathy, hepatosplenomegaly, hypercalcaemia through involvement of the skin, lung, bones and other organs.

HTLV-1 can also cause a progressive disease of the nervous system called either HTLV-1 associated myelopathy (HAM) or tropical spastic paraparesis (TSP). This is a chronic inflammatory disease of the central nervous system, characterized by progressive spastic weakness of the lower limbs, lower back pain and bowel and bladder dysfunction. Clinical findings can include muscle weakness, hyperreflexia and clonus in the lower limbs, along with extensor plantar response and a spastic gait. The lifetime risk among people with HTLV-1 infection of developing ATL is estimated at 5% and of HAM or TSP at 2%.

Prevention

Public health strategies and interventions that could prevent HTLV-1 transmission include:

- **formula feeding instead of breastfeeding to prevent mother to child transmission in women living with HTLV;**
- **breast milk freeze thaw method and leukoreduction are considered in some settings;**
- **condom use will reduce the risk of sexual transmission;**
- **needle exchange programmes; and**
- **screening blood donations for HTLV.**

It is important to increase public awareness to support these interventions and to ensure diagnostic capacity is available in high-prevalence settings to screen and diagnose people living with HTLV.

There is currently no vaccine for HTLV-1, although development of a vaccine is considered feasible. No candidate HTLV-1 vaccine has proceeded to a clinical trial with an efficacy endpoint so far.

Treatment

There is currently no treatment for HTLV-1 infection. Treatment focuses on managing associated conditions and includes corticosteroids, immune modulating drugs and chemotherapy.

WHO response

In collaboration with Member States and partners, WHO works to develop guidance on HTLV-1 surveillance methods, including methods to determine prevalence and methods for monitoring interventions. This includes rapid assessment methods and burden of disease estimates. Specific guidance is also needed for low-resource settings on testing approaches and strategies for HTLV-1 detection that are appropriate to the setting and the purpose.

Further testing and analysis will determine whether there is a level of proviral load below which transmission risk is negligible, as well as specific data to better define the risk of mother-to-child HTLV-1 transmission and the effectiveness of prevention strategies.