

# Prevalence of Human T Lymphotropic Virus Type 1 in Pregnant Women: a Narrative Review

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**Received:** 2019/03/18

**Revised:** 2019/10/21

**Accepted:** 2019/10/23



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## ABSTRACT

**Background and Objectives:** Human T lymphotropic virus type I (HTLV-I) is a virus of the *Retroviridae* family, which has infected more than 20 million people around the world. The study aimed to review the prevalence of HTLV infection in pregnant women.

**Methods:** We searched various databases including PubMed, EMBASE, Scopus, Google Scholar, SID, Magiran and Irandoc using the following keywords: HTLV-1, HTLV-2, *Retroviridae*, pregnancy, prevalence, incidence, women and female. Abstracts, short/brief reports as well as original and review articles published on HTLV-1 and/or HTLV-2 infection during pregnancy until October 2018 were included in the study.

**Results:** We found five articles from Iran and 14 articles from other parts of the world on the prevalence of HTLV-1 infection in pregnant women. Prevalence of HTLV-1 and or HTLV-2 was higher in pregnant women than in non-pregnant women in cities of Mashhad and Neyshabur, Razavi Khorasan Province (1.5 to 3.3 %), northeastern Iran, which are endemic areas of Iran for HTLV-1 infection. The incidence rate of HTLV-1 infection was 400-500 per 10,000 pregnant women in endemic areas of Japan. In Brazil, the rate of HTLV-1 infection in pregnant women was estimated to be 1.05%.

**Conclusion:** The prevalence of HTLV-1 varies among pregnant women depending on residence in endemic or non-endemic areas for HTLV-1. In endemic areas, it is recommended to perform routine screening for HTLV-1 infection in the general population, especially pregnant women.

**Keywords:** Human T Lymphotropic Virus Type 1, mothers, prevalence, pregnancy.

## INTRODUCTION

Human T-lymphotrophic virus type I and 2 (HTLV-I and HTLV-2), first described in 1980, are members of the family *Retroviridae* that have infected more than 20 million people around the world (1). More recently, two other HTLV viruses (HTLV3 and HTLV4) have been also identified (1).

HTLV-1 infection is often asymptomatic but can rarely cause serious complications including adult T-cell leukemia/lymphoma and a chronic myelopathy known as HTLV-1-associated myelopathy/tropical spastic paraparesis, uveitis, chronic arthropathy, Hashimoto thyroiditis and pulmonary alveolitis (1-3). Infection with HTLV1 is diagnosed by enzyme-linked immunoassay and confirmed with another method such as western blotting, immunofluorescence, radioimmunoprecipitation assay or polymerase chain reaction (1).

In Iran, the prevalence of HTLV-1 varies widely among patients and the general population (from 0.08 % to 6.55%) (2,4). In another study, the rate of HTLV-1 infection in pregnant women was 1.39% (5).

The seroprevalence of HTLV-1 ranges from 400 to 500 per 10,000 pregnant women and from 10 to 100 per 10,000 pregnant women in endemic and non-endemic areas of Japan, respectively (6).

Transmission of HTLV-1 mainly occurs through unprotected sex, breastfeeding, transplacental infection, contaminated needles and blood transfusion. Maternal-fetal HTLV-1 transmission rate is estimated to be around 2.7% in bottle-fed infants, 5% in short-term breastfed infants and about 20% in long-term (more than 3 months) breastfed infants (5,6).

The aim of this study was to review the global prevalence of HTLV-1 and/or HTLV-2 infection in pregnant women.

## MATERIALS AND METHODS

Various databases including PubMed, EMBASE, Scopus, Google Scholar, SID, Magiran and Irandoc were searched using the following keywords: HTLV-1, HTLV-2, *Retroviridae*, pregnancy, prevalence, incidence, women and female. Abstracts, short/brief reports as well as original and review articles published on HTLV-1 and/or HTLV-2 infection during pregnancy until October 2018 were included in the study.

## RESULTS

A limited number of studies was found on the prevalence of HTLV-1 and/or HTLV-2 infection in pregnant women in Iran (Table 1).

## DISCUSSION

The seroprevalence of HTLV-1 or HTLV-1/2 is high in the general population as well as in specific groups of individuals, such as blood transfusion candidates and/or pregnant women of southwestern Japan (up to 10%), the Caribbean Basin (up to 6%), sub-Saharan African countries and certain areas of Iran and Melanesia (less than 5%) (1).

Our review showed that the prevalence of HTLV-1 and or HTLV-2 was higher in pregnant women in cities of Mashhad (1.5%) and Neyshabur (1.30%), northeastern Iran (5, 7). The prevalence of HTLV-1/HTLV-2 infection in non-pregnant women was also highest in this area (2 to 5.17%) (5), which is endemic for HTLV-1/HTLV-2 infection. Hamedi et al. found no significant correlation between HTLV-1 positivity and maternal age, gestational age and newborns' gender or weight (7).

Table 1. The prevalence of HTLV-1 infection in pregnant women in Iran

Author	Prevalence of HTLV-1	Assay	Year	Number of patients	Location
Hedayati-moghadam et al. <sup>5</sup>	1.39%	ELISA and Western blot	2011	145	Neyshabur, Razavi Khorasan Province
Hamedi et al. <sup>7</sup>	1.5%	ELISA and PCR	2010-2011	407	Mashhad, Razavi Khorasan Province
Ghaffari et al. <sup>2</sup>	0	ELISA	2011	122	Sari, Mazandaran Province

ELISA: enzyme-linked immunosorbent assay, PCR: polymerase chain reaction.

In endemic areas of Brazil, the prevalence of HTLV-1 infection in pregnant women is estimated to be 1.05% (8). In endemic areas, the virus can spread vertically (from mother to child) or via sexual contact, blood products and needle-sharing among drug users (1). In Iran, as expected, the prevalence of infection in endemic areas is higher in both pregnant and non-pregnant women (5, 7). HTLV-1 infection rate was reported to be 400-500 and 10-100 per 10,000 pregnant women in highly-endemic areas and non-endemic areas of Japan, respectively (6).

In European studies, the prevalence of HTLV-1 was 0.7 per 10,000 in Germany, 0.31 per 100 in the UK, 11.5 per 10,000 in France and 4.4 per 10,000 in total (9). Although, HTLV-1/2 transmission can occur during labor/delivery, the majority of maternal-fetal transmissions are through breastfeeding. Breastfeeding for over six months and high proviral load in breast milk are usually considered risk factors of HTLV transmission. The best way to prevent HTLV-1 infection in infant of a seropositive mother is bottle feeding. In developing countries, to prevent breastfeeding avoidance, breastmilk can be frozen and thawed or pasteurized before use. There is not enough information to show that the mode of delivery or antiviral therapy during or after pregnancy can reduce the risk of HTLV transmission to infants. It has been reported

that HTLV-I infection occurs more commonly as people age and is more prevalent in women (10).

In some endemic countries, such as Japan, Martinique, Brazil and some parts of Iran, screening for HTLV-1 during pregnancy has been introduced (3,7,10). Since the prevalence of HTLV-1 infection in endemic areas is higher in pregnant women than non-pregnant women, routine screening of HTLV-1 is recommended. Routine newborn screening test, pasteurizing breastmilk or using formula to feed newborns of seropositive mothers can reduce the risk of HTLV-1 transmission.

## CONCLUSION

The prevalence of HTLV-1 varies among pregnant women depending on residence in endemic or non-endemic areas for HTLV-1. In endemic areas, it is recommended to perform routine screenings for HTLV-1 infection in the general population, especially pregnant women.

## ACKNOWLEDGEMENTS

The authors would like to thank the Clinical Research Development Unit (CRDU) of Bu-Ali Sina hospital, Mazandaran University of Medical Sciences (Sari, Iran) for their support, cooperation and assistance throughout the study period.

## CONFLICT OF INTEREST

All authors declare that there is no conflict of interest.

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