# Prevention of MTCT OF HTLV

Sasan.ms

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## Determinants of HTLV-1 MTCT

•Studies on HTLV-1 MTCT determinants have focused mainly on:

**1.genetic host factors,**

**2.immunological host factors,**

**3. lactation duration**

**4.milk components.**

# Genetic host factors

study by Plancoulaine *et al.* [53] indicated a genetic predisposition for HTLV-1 infection itself for 1.5% of the population, which concerned almost all infected children under 10 years of age, *i.e.*, infected through breastfeeding.

## Role of maternal anti-HTLV-1 antibodies may appear controversial

- A higher maternal proviral load and a higher anti-HTLV-1 antibody titer were independently associated with a higher risk of HTLV-1 MTCT.
- The protective role of anti-HTLV-1 antibodies has been demonstrated in a rabbit model of infection, where **passive immunization** was shown to **prevent milk-borne transmission** of HTLV-1 to offspring.
- The addition of **HTLV-1 serum cord blood plasma is able to prevent** the infection of human neonatal lymphocytes when co-cultured with breast-milk cells of HTLV-1 carrier mothers.

# Red book 2018

Although freezing/thawing of expressed human milk may decrease infectivity of human milk.

- Women in the United States who are HTLV-1 seropositive should be advised **not to breastfeed**.

- **Routine screening** for both HTLV-1 or HTLV-2 during pregnancy **is not recommended.**


PEDIATRICS INTERNATIONAL

Pediatrics International (2017) 59, 227–236

Clinical Notes

**Failure to prevent human T-cell leukemia virus type 1 mother-to-child transmission in Japan**

In **Japan**, the nationwide **mother-to-child transmission prevention program** for HTLV-1 was introduced in **2011**.

ESPID Reports and Reviews





# Mother-to-child Transmission of Human T-cell Lymphotropic Virus Type 1

*The Pediatric Infectious Disease Journal* • Volume 32, Number 2, February 2013

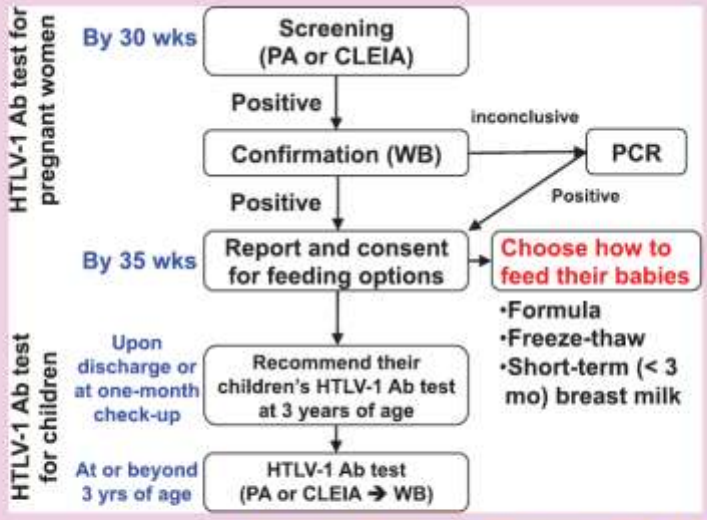



**FIGURE 2.** A flow chart showing a national program for prevention of MTCT of HTLV-1. The details are described in the text (modified from Moriuchi[20]). PA indicates particle agglutination; CLEIA, chemiluminescent enzyme immunoassay; PCR, polymerase chain reaction; WB, Western blotting

be impracticable for many mothers. Expressed breast milk should be frozen at –20°C or below for >12 hours. MTCT can be reduced

lost. An expected outcome of withholding breastfeeding is reduction of MTCT rate from 15%–20% to 2%–3%. Since lifetime

formula-feeding will reduce incidence of ATLL patients among individuals born from HTLV-1 carrier mothers from 0.75%–1% to 0.1%–0.15%. In contrast, breastfeeding can

(MTCT). Unlike HIV, which may be transmitted by free virions or via infected cells, the transmission of HTLV-1 is only cell-associated. As a result, HTLV-1 is less contagious than HIV, requiring more intimate and prolonged contact for transmission. HTLV-1 may

ally or 3) by blood-borne transmission. The increasing HTLV-1 seroprevalence in women with age may reflect the relative efficiency of sexual transmission from men to women, compared with women to men. Blood-borne

MTCT and ATLL develops only after MTCT,

age of onset is 67 years), and is unlikely to develop if HTLV-1 infection acquired in adult life.[2] Risk factors for the development

those children was 11.9 months.[19] A number of small Japanese studies in Japan suggest that short-term breastfeeding (<3 months) was as effective as exclusive bottle-feeding in reducing MTCT of HTLV-1.

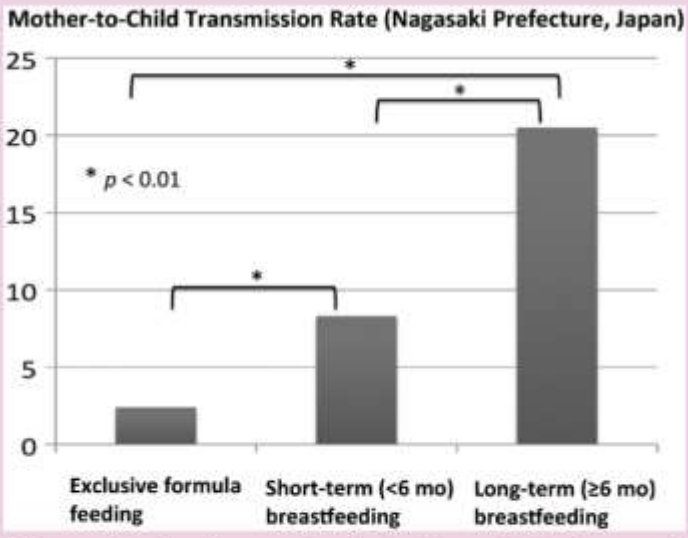



**FIGURE 1.** MTCT rates by feeding methods in Nagasaki Prefecture, Japan, between 1987 and 2000 are shown (modified from reference[10]). There are statistically significant differences between the 3 groups.

PEDIATRICS INTERNATIONAL Official Journal of the Japan Pediatric Society

*Pediatrics International* (2014) **56**, 640–643 doi: 10.1111/ped.12385

Brief Report

# Current human T-cell lymphotropic virus type 1 mother-to-child transmission prevention status in Kagoshima

Yasuhito Nerome,[1,3] Kanami Kojyo,[1] Yumiko Ninomiya,[1] Tamayo Ishikawa,[1] Ayano Ogiso,[1] Syuji Takei,[1] Yoshifumi Kawano,[1] Tsutomu Douchi,[2] Toshiro Takezaki[3] and Tetsuhiro Owaki[3]

*Departments of [1]Pediatrics, [2]Obstetrics and Gynecology and [3]Education Center for Doctors on Remote Islands and in Rural Areas, Kagoshima University Graduate School of Medical and Dental Sciences, Kagoshima, Japan*

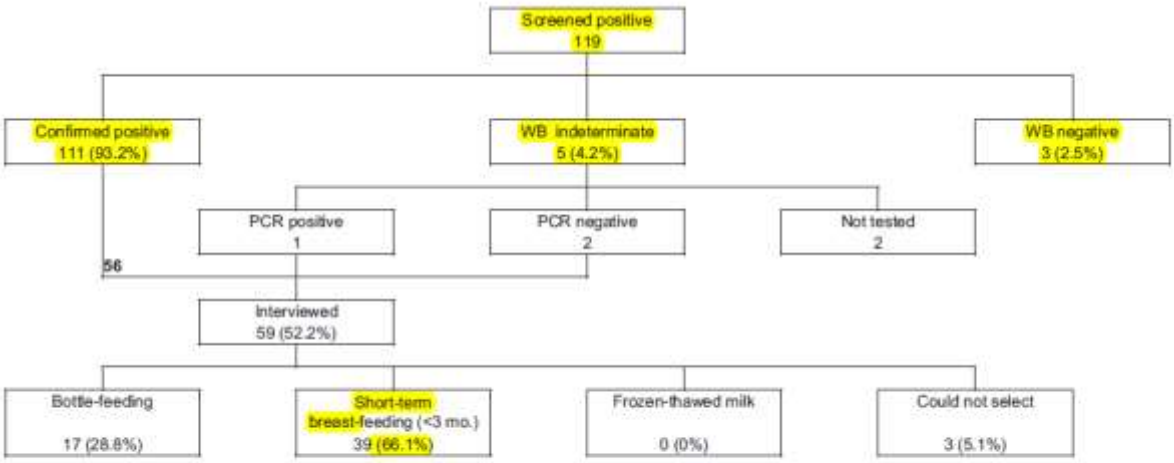



**Fig. 2** Rate of human T-cell lymphotropic virus type 1 (HTLV-I) carrier status among pregnant women and their choices for their babies' nutrition before delivery. The rate of HTLV-I carrier status among pregnant women in Kagoshima Prefecture was presumed to be about 1.3%. We interviewed 56 of 111 confirmed positive pregnant women and three Western blot (WB) indeterminate pregnant women. Approximately two-thrids of HTLV-I carrier pregnant women chose short-term breast-feeding. PCR, polymerase chain reaction.

International Scholarly Research Network
ISRN Obstetrics and Gynecology
Volume 2012, Article ID 975135, 5 pages
doi:10.5402/2012/975135

| گروه مورد مطالعه | تعداد کل مادران | مادران HTLV مثبت | شیرخوارن HTLV PCR مثبت در ۱۲-۹ ماهگی |
|---|---|---|---|
| زایمان‌های بیمارستان ام البنین مشهد ۹۰-۱۳۸۹ | ۴۰۷ | ٪۱.۵ (۶ نفر) Both PCR and Eliza | یک نفر |

*Clinical Study*

# The Prevalence of Human T-Cell lymphotropic Virus Type 1 in Pregnant Women and Their Newborns

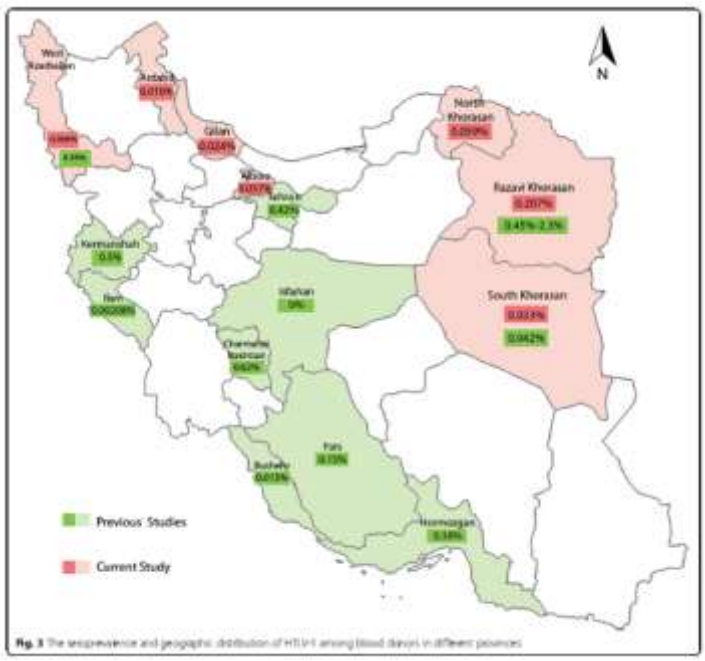
A. Hamedi,[1] F. Akhlaghi,[2] Z. Meshkat,[3] M. Sezavar,[1] H. Nomani,[3] and M. Meshkat[4]

Table 1. HTLV-1/2 Prevalence in Pregnant Women in Diverse Geographical Areas

| Area | Prevalence (n/10 000) | References |
|---|---|---|
| Nigeria | 1670 | [46] |
| Japan | | |
| Endemic areas | 400–500 | [36] |
| Nonendemic areas | 10–100 | |
| Germany | 0.7 | [17] |
| France | 11.5 | |
| Spain | 2 | [37] |
| Argentina | 19 | [38] |
| Martinique | 193 | [39] |
| Peru | 170 | [40] |
| Jamaica | 200 | [41] |
| Gabon | 210 | [42] |
| Ghana | 250 | [43] |
| French Guiana | 344 | [44] |
| Zaire | 370 | [45] |
| Brazil | 0–100 | [47–53] |

**Table 2** Seroprevalence of HTLV-1 infection among blood donors from seven provinces of Iran (per 100,000)

| Location | Donors, no. | Confirmed HTLV-1 + | |
|---|---|---|---|
| | | Donors, no. | Prevalence per 100,000 (95% CI) |
| Alborz | 264340 | 151 | 57 (50–70) |
| Ardabil | 139613 | 14 | 10 (0–21) |
| Gilan | 373227 | 92 | 24 (20–30) |
| North Khorasan | 79035 | 47 | 59 (40–80) |
| Razavi Khorasan | 628667 | 1301 | 207 (200–220) |
| South Khorasan | 72185 | 24 | 33 (20–50) |
| West Azerbaijan | 307422 | 211 | 68 (60–80) |
| Total | 1864489 | 1840 | 98 (97–99) |



## Clinical Manifestations Nelson Textbook of Pediatrics, Chapter 277, 1666-1667.e1

•**HTLV-1–associated uveitis** may be unilateral or bilateral, is more common among women, and resolves spontaneously, although it often recurs within 1-3 yr. Topical corticosteroids hasten recovery.

•**HTLV-1–associated infective dermatitis** is a chronic and recurrent eczematous disease occurring during childhood and adolescence.

•HTLV-1 infection predisposes to disseminated and recurrent *Strongy-loides stercoralis* infection

• increased risk of developing tuberculosis disease following latent infection and severe scabies

•**HTLV-1–associated arthropathy** mimics rheumatoid arthritis, including a positive rheumatoid factor. Treatment is with antiinflammatory agents.

***C section*** is not indicated for MTCT prevention of HTLV

viruses

MDPI

Review

Mother-to-Child Transmission of HTLV-1
Epidemiological Aspects, Mechanisms and
Determinants of Mother-to-Child Transmission

*Viruses* 2016, *8*, 40; doi:10.3390/v8020040

. It is now clear that HTLV-1 MTCT mainly involves prolonged breastfeeding,

It is now clear that HTLV-1 MTCT mainly involves prolonged breastfeeding, as demonstrated by epidemiological, virological and experimental data. However, the mechanisms of such a transmission remain largely unknown.

viruses

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- Of note, this residual rate (2.5%) of MTCT in the absence of breastfeeding raised
- the possibility of minor secondary routes, such as contamination during delivery, or intrauterine
- transmission. This latter route remains controversial, since contradictory studies on the presence of
- HTLV-1 in cord-blood samples from seropositive babies have been reported

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# The role of breastfeeding duration on HTLV-1 MTCT

• It seems rather clear that such a role corresponds to a combination of the

1. cumulative viral input,

2.the changes over time in milk composition in infected cell types,

3. maternal antibodies,

4.immune status and maturation of the neonate's gut.

- The role of maternal anti-HTLV-1 antibodies may appear controversial.
- However, a high anti-HTLV-1 antibody titer in the serum may be correlated with a high provirus load in PBMCs, which is a risk factor for HTLV-1 MTCT [57].
- In an analysis including the provirus load in maternal PBMCs, the presence of anti-Tax antibodies and the anti-HTLV-1 titers, it was found that a higher maternal proviral load and a higher anti-HTLV-1 antibody titer were independently associated with a higher risk of HTLV-1 MT.CT

- Concerning the immunological factors involved in HTLV-1 MTCT, the role of maternal anti-HTLV-1 antibodies may appear controversial.
- Such studies have to take into account the duration of breastfeeding, since the protective role of anti-HTLV-1 antibodies has been demonstrated in a rabbit model of infection, where passive immunization was shown to prevent milk-borne transmission of HTLV-1 to offspring [56].
- Moreover, it has been shown in vitro that the addition of HTLV-1 serum cord blood plasma is able to prevent the infection of human neonatal lymphocytes when co-cultured with breast-milk cells of HTLV-1 carrier mothers [12].
- However, it has been suggested that higher anti-HTLV-1 antibodies titer in the serum of the mother, as well as the presence of anti-Tax antibodies, is associated with a higher risk of children infection.

## Japan, the nationwide mother-to-child transmission prevention program for HTLV-1

•In the program, screening of pregnant women for HTLV-1 infection

•was implemented, and positive results confirmed on western blot.


- The HTLV-1 window period is not clear.
- It is possible that the HTLV-1 window period is >1 year after exposure because children born to seropositive mothers can acquire HTLV-1 antibodies by 3 years of age.
- Confirmed pregnant women with HTLV-1 are recommended to use three feeding methods: formula feeding, short-term breast-feeding, and feeding with thawed frozen milk to prevent mother-to-child transmission.
- After the children reach 3 years of age, it is recommended that the children are screened for antibodies against HTLV-1.