JOURNAL OF MULTIDISCIPLINARY SCIENCES AND INNOVATIONS
GERMAN INTERNATIONAL JOURNALS COMPANY
ISSN: 2751-4390
IMPACT FACTOR (RESEARCH BIB) : 9,08. Academic research index

TORCH INFECTION AND ITS EFFECT ON THE FETUS

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Abstract: This article provides information about TORCH infection and its pathogens. This condition has long been regarded as a serious health concern among many countries. TORCH refers to a group of infections including CMV, cCMV, hepatitis viruses, HIV, and herpes viruses. Every year, a significant number of newborns and mothers suffer from complications caused by TORCH infections. The article focuses particularly on protection, early diagnosis, and clinical management of these infections. In many cases, TORCH infections may remain asymptomatic in women until pregnancy, when they may begin to manifest symptoms.

Keywords: TORCH, syphilis, herpes, HIV, ZIKA, Toxoplasma gondii, cytomegalovirus (CMV), cCMV, blood tests, CT, MRI, IgM, IgG, seroprevalence, ELISA test, PCR, IUFD, placenta, fetus.

Introduction:

TORCH is a term commonly used in gynecology to describe a group of infections that can significantly impact pregnancy. These infections are often asymptomatic and hard to detect during pregnancy but can result in severe complications such as congenital anomalies, oligohydramnios, and fetal growth restriction (FGR). They can lead to intrauterine fetal death (IUFD), recurrent pregnancy loss (RPL), or stillbirth. The acronym TORCH was introduced by immunologist Andre Nahmias [7].

The extended STORCH abbreviation includes:

S – Syphilis (Treponema pallidum)

T – Toxoplasmosis (Toxoplasma gondii)

O – Others: Parvovirus B19, Varicella-zoster virus, Hepatitis B and C, HIV, Chlamydia, Coxsackie virus, Listeria monocytogenes, Streptococcus agalactiae, Zika virus

R – Rubella

C – Cytomegalovirus

H – Herpes Simplex Virus

According to recent data, maternal mortality remains high in the Northern Triangle of Central America (El Salvador, Guatemala, Honduras), with rates of 54,000, 88,000, and 129,000 per 100,000 live births respectively [1]. The UN's 2030 Sustainable Development Goals aim to reduce maternal and child mortality and prevent the spread of infectious diseases. However, despite global efforts to reduce congenital anomalies, the Northern Triangle has not been fully integrated into coordinated public health actions [3].

Though rubella was eradicated in the Americas in 2015, other TORCH infections remain problematic due to limited preventive options like vaccination or effective antiviral treatments.

Etiology and Pathogenesis:

TORCH infections affect the fetus through two major mechanisms:

1. Primary impact: The fetus is exposed to pathogens against which its immune system is unprepared.

2. Secondary impact: Toxins produced during infection cause fetal damage.

A notable feature of TORCH infections is their asymptomatic or mildly symptomatic nature in the mother, which can lead to unnoticed transmission and significant fetal consequences.

The risk of fetal damage from primary CMV infection is ~40%.

Toxoplasmosis transmission rates: 15–25% in the first trimester, 60–70% in the second.

Rubella transmission during the first trimester nears 100%, often resulting in severe congenital syndromes.

Herpes simplex mainly affects the neonate during childbirth and poses serious health risks.

CMV is a common DNA virus with high global prevalence and is a leading cause of teratogenic congenital infections. Congenital CMV (cCMV) can lead to sensorineural hearing loss, developmental disorders, and cerebral palsy.

Transmission:

TORCH pathogens can be transmitted:

Transplacentally

During delivery (through the birth canal)

Postnatally (e.g., via breastfeeding)In some regions, TORCH seroprevalence among pregnant women for IgM antibodies ranges from 3.41% to 22.64%, and for IgG antibodies from 19.2% to 70.51%. Congenital anomalies such as heart defects, hydrocephalus, cataracts, and rubella syndrome are more frequent in seropositive individuals [1].

Clinical Manifestations and Diagnosis:

Newborns with signs such as rash, heart murmur, or eye defects should be evaluated for all TORCH pathogens.

Diagnostic methods include:

Serological tests (IgM and IgG)

PCR for detecting viral DNA/RNA from samples like saliva, blood, urine, amniotic fluid, or skin lesions

Imaging: CT or MRI for assessing fetal abnormalities

Amniocentesis after 17 weeks of gestation in suspected CMV

IgM suggests acute infection, while IgG indicates prior exposure or immunity. Quantitative tests

are preferred to determine the timing of infection.ELISA tests are commonly used for IgM detection due to their high sensitivity and specificity.

Disease-Specific Notes:

CMV: Associated with microcephaly, periventricular calcifications, epilepsy, and auditory/visual impairments. Diagnosed via serology, PCR, and imaging. Amniotic fluid PCR after 22 weeks confirms fetal infection with ~70–80% accuracy. Herpes simplex virus (HSV): Transmitted via genital contact or perinatal exposure. Present in ~3% of pregnant women globally. Toxoplasmosis: Highest risk in the first trimester, potentially causing miscarriage, hydrocephalus, and ocular damage. Second-trimester infection can result in epilepsy and chorioretinitis. Third-trimester transmission is high (60%) but often subclinical. Diagnosis via IgM/IgG, PCR, ultrasound, and amniocentesis.

Prevention and Management:

Preventive measures include:

Preconception TORCH screening

Strict hygiene during pregnancy

Proper cooking of meat/dairy

Regular handwashing and personal hygiene

CMV management remains challenging due to lack of effective vaccines or universal antiviral prophylaxis. Ganciclovir and valganciclovir are used in symptomatic infants to preserve hearing and improve neurodevelopmental outcomes. Long-term therapy (e.g., 16 mg/kg valganciclovir orally twice daily for 6 months) has shown promising results in reducing sequelae.

Field Research:

A study conducted at the Andijan District Central Hospital found that 35.3% of pregnant women tested positive for TORCH infections. Healthcare providers emphasized the importance of early diagnosis and education for patients.

Conclusion:

In summary, TORCH infections—particularly syphilis, toxoplasmosis, rubella, CMV, and herpes—pose a significant risk to pregnant women and their unborn children. These infections often go unnoticed until pregnancy, making early screening and prevention critical. If left undiagnosed, they may result in congenital anomalies, growth restrictions, or even fetal death. Diagnostic tools such as serology, PCR, and ultrasound play vital roles in detection. Preventive strategies should prioritize healthy sexual practices and hygiene, as many TORCH pathogens are transmitted sexually.

References:

1. S. Temirova, Infectious Diseases, Tashkent, 2008

2. F.M. Ayupova, Yu.Q. Djabbarova, Gynecology, Tashkent, Mekhridaryo, 2014

3. X. Saparov, Highly Dangerous Infectious Diseases, Tashkent, 2016

4. Med360.uz

5. www.ziyonet.uz

6. Nayak S, et al. "Association of TORCH disease and fetal safety in women with a history of poor fertility in East Indian strong-ranked women." NeuroQuantology, 2022; 20:54

7. Bascietto F, et al. "Fetal outcome with regional parvovirus B19 infection: A systematic review and meta-analysis." Ultrasound Obstet Gynecol. 2018; 52(5):569–576

8. Cardoso-dos-Santos AC, et al. "International collaboration networks for the surveillance of congenital anomalies: A narrative review." Epidemiol. Serv. Saúde. 2020; 29:e2020093

9. Cooper JM, Sanchez PJ. "Congenital Syphilis." Semin Perinatol. 2018; 42(3):176–184