OPEN ACCESS Freely available online

ISSN: 2090-7214
Clinics in Mother and Child Health

Commentary

Transmission of Diseases from Mother to Child: Clinical Pathways, Risk Factors and Preventive Health Strategies

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DESCRIPTION

Transmission of diseases from mother to child refers to the passage of infectious agents from a pregnant individual to the fetus or newborn during pregnancy, childbirth or breastfeeding. This process is medically referred to as vertical transmission and represents an important area of concern in maternal and neonatal healthcare systems. The impact of such transmission varies widely depending on the type of infectious agent, timing of exposure and immune response of both mother and infant. Transmission may occur through three main pathways. The first is trans placental transmission, where infectious agents cross the placenta during pregnancy and directly affect fetal development. The second is intrapartum transmission, which occurs during labor and delivery when the newborn is exposed to maternal blood, vaginal secretions or contaminated fluids. The third pathway is postnatal transmission, which occurs after birth through breastfeeding or close contact.

Several infectious diseases are known to be transmitted through these routes. Viral infections such as Human Immunodeficiency Virus (HIV), hepatitis B, cytomegalovirus and rubella are among the most recognized causes. Bacterial infections such as group B streptococcus may also be transmitted during delivery. In some regions, parasitic infections like toxoplasmosis contribute to congenital disease burden. The clinical outcome depends on timing and intensity of exposure. The stage of pregnancy during which infection occurs plays a significant role in determining fetal outcomes. Early pregnancy infections are more likely to interfere with organ development, leading to structural abnormalities or growth restriction. Infections occurring later in pregnancy may result in functional impairments, preterm delivery or neonatal illness. Postnatal exposure, especially through breastfeeding, may influence infant immunity and health stability.

Clinical presentation of congenital infections varies depending on the pathogen involved. Some newborns may appear asymptomatic at birth but develop symptoms later in life. Others may show early signs such as fever, jaundice, poor feeding, respiratory distress or low birth weight. In more severe cases, neurological involvement, developmental delays or organ dysfunction may be observed. Risk factors influencing mother-to-child transmission include maternal immune status, viral load in blood, access to antenatal care and presence of untreated infections during pregnancy. Limited healthcare access and delayed diagnosis increase the likelihood of transmission. Coexisting medical conditions may also weaken maternal immune defenses and increase susceptibility to infection.

Diagnostic approaches include antenatal screening tests, maternal blood analysis and neonatal laboratory evaluation after birth. Early detection plays an important role in reducing complications and guiding appropriate treatment strategies. Preventive measures are a key component of maternal healthcare. Antenatal screening programs help identify infections early in pregnancy, allowing timely intervention. Vaccination against preventable diseases such as rubella and hepatitis B reduces transmission risk. Antiretroviral therapy in HIV-positive pregnancies significantly lowers the probability of vertical transmission when properly managed.

In addition to medical interventions, hygiene practices and safe delivery planning contribute to reducing infection risk. Controlled delivery environments and sterile procedures help minimize exposure during childbirth. Treatment may include antiviral or antibiotic therapy, supportive neonatal care and long-term monitoring for developmental outcomes. Early intervention improves survival rates and reduces long-term complications.

In conclusion, transmission of diseases from mother to child is influenced by multiple biological and environmental factors. Understanding transmission pathways, risk conditions and preventive strategies is essential in reducing neonatal disease burden. Strengthening antenatal screening, improving infection control practices and ensuring timely medical intervention are key components in protecting maternal and infant health.

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Received: 01-Dec-2025, Manuscript No. CMCH-25-31367; **Editor assigned:** 03-Dec-2025, Pre QC No. CMCH-25-31367 (PQ); **Reviewed:**17-Dec-2025, QC No. CMCH-25-31367; **Revised:**24-Dec-2025, Manuscript No. CMCH -25-31367 (R); **Published:** 31-Dec-2025, DOI: 10.35248/2090-7214.25.22.557

Citation: Perera L (2025) Transmission of Diseases from Mother to Child: Clinical Pathways, Risk Factors and Preventive Health Strategies. Clinics Mother Child Health. 22:557.