



- A severe infection can result in severe effects on the fetus!
- Maternal antibodies (especially IgG) cross the placenta to the fetus to protect him (especially if the mother is infected).
- Researchers have found that infants whose mothers were infected with malaria or helminthes during pregnancy have impaired immune response to standard vaccines against Hemphilus influenza and diphtheria.
- There is a coordinated response between the fetus, placenta and the mother aiming to deal with an infection (the burden is not only on the mother’s immune system).
- Placenta plays a modulatory role in the dynamics of immunity between the mother and the fetus. Therefore, the fetus –considered as a foreign body- will not be rejected by the mother’s body! On other words, immunity is modulated but not suppressed in pregnancy.

Fetus and infections:

• **Indirect effects on:**

- ✓ Oxygen transport.
- ✓ Exchange of nutrients.

• **Direct effects** on the fetus are seen more commonly with viruses because they are small, intracellular and actively enter intervillous spaces.

- ✓ Viruses express their effects on the fetus when there is a severe infection except infection caused by the following:

- ❖ Rubella.
- ❖ Cytomegalovirus (CMV).
- ❖ Herpes Simplex Virus (HSV).

Where even a mild infection with these viruses might result in disastrous effects on the fetus!

What are the complications of infections?

- Miscarriage.
- Congenital anomalies.
- Fetal hydrops.
- Fetal death!
- Pre-term delivery.
- Premature Rupture Of Membranes (PROM).

In utero infections:

| | |
|------------------|---|
| Bacteria | <ul style="list-style-type: none"> • T.pallidum: congenital syphilis • Listeria: fetal death & malpresentation |
| Viruses | <ul style="list-style-type: none"> • DNA viruses: parvovirus B19, CMV (resulting in rash and hepatosplenomegaly), Varicella zooster and Hepatitis-B Virus (HBV) • RNA viruses: Rubella (resulting in cataracts, deafness and cardiac abnormalities), HIV and zika (which results in microcephaly) |
| Parasites | <ul style="list-style-type: none"> • Toxoplasma gondii |

Perinatal infections (where baby gets infected during delivery. These microorganisms could be present in the vaginal canal although the mother is asymptomatic!):

| | |
|-----------------|--|
| Bacteria | <ul style="list-style-type: none"> • E.coli • Group-B Streptococci • Listeria monocytogens • Neisseria gonorrhoea • Chlamydia trachomatis: results in neonatal conjunctivitis |
| Viruses | <ul style="list-style-type: none"> • Herpes Simplex Virus (HSV): results in stomatitis • Hepatitis-B Virus (HBV) |



| | |
|--------------|--|
| | <ul style="list-style-type: none"> • HIV • Varicella zooster • Human Papilloma Virus (HPV). |
| Fungi | <ul style="list-style-type: none"> • Candida |

- **Infections which can be transmitted via breast-feeding:**

| | |
|-----------------|--|
| Bacteria | <ul style="list-style-type: none"> • Tuberculosis |
| Viruses | <ul style="list-style-type: none"> • HIV |

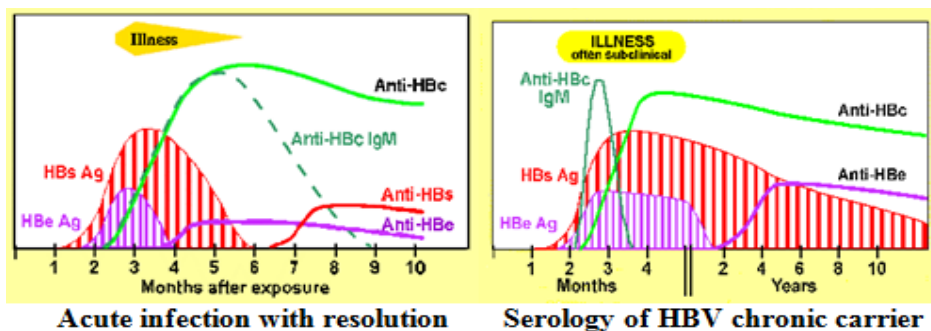
- **Toxoplasma:**

- Most of the time, it is asymptomatic although it is very common.
- This parasite is found in all warm-blooded animals (including pets, livestock and humans).
- IgG seropositivity ranges 20-35% in the general population of our region!!
- **Transmission:**
 - ✓ Ingestion of food or water contaminated with oocytes.
 - ✓ Inhalation of tissue cysts.
 - ✓ From undercooked meat of infected animals.
 - ✓ Vertical transmission: occurs only when the mother gets infected during pregnancy.
- **There is increased risk of infection with:**
 - ✓ Pregnant women who are seronegative.
 - ✓ Immunosuppressed individuals.
- Majority of infected infants show no symptoms of toxoplasma infection at time of birth! (these symptoms will appear later).
- **Investigations:**
 - ✓ Indirect (serology):
 - ❖ IgM antibodies appear soon after the infection but start to decline within few weeks.
 - ❖ IgG (+) lady → means that she has protective antibodies.
 - ✓ Direct (by detecting parasites themselves).
- **Treatment:** spiramycin (it is a macrolide antibody which is safe during pregnancy).

- **Hepatitis-B Virus (HBV):**

- Intrapartum infection = 95%
- **Markers for diagnosis:**

| | HBsAg HBeAg HBV-DNA | HBcAb IgM | HBcAb IgG | HbsAb IgG |
|--------------------------|---------------------------|-----------|-----------|-----------|
| Acute infection | + | + | - | - |
| Window period | - | + | - | - |
| Prior infection | - | - | + | + |
| Immunization | - | - | - | + |
| Chronic infection | + | + | + | - |



- Prevention of perinatal infection: vaccination!



- **Hepatitis-C Virus (HCV):**
 - **Risk of transmission to the fetus** = 6-30% (especially if the mother is infected with HIV).
 - **Diagnosis of the acute phase:**
 - ✓ HCV-RNA.
 - ✓ ELISA.
- **Congenital HIV:**
 - 20-40% peripartum transmission (during delivery).
 - Cesarean section decreases the risk of transmission by 4-folds!
 - If viral count < 1000 → negligible risk to fetus.
 - **Risk factors to get HIV:**
 - ✓ Unprotected anal or vaginal sex.
 - ✓ Co-infection.
 - ✓ Contaminated needles (drug abusers).
 - ✓ Blood transfusions.
 - ✓ Accidental needle stick injuries.