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Infectious Agents Causing Abortion Among Pregnant Women : An Article Review

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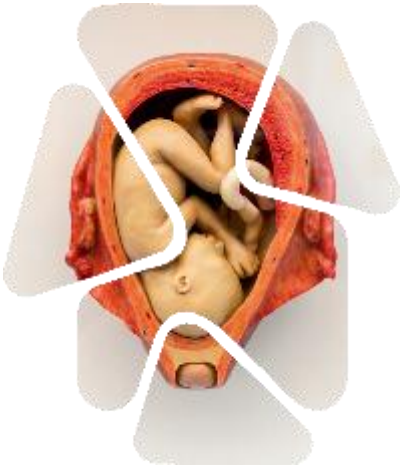
ABSTRACT

Background: Abortion is a spontaneous loss of pregnancy before 20 weeks. Approximately 42 million pregnancies end in abortion. The maternal infections that are transmissible from mother to fetus are caused by many pathogens, of which the TORCH complex contributes majorly to neonatal and infant deaths globally.

The aim of this study is to identify the prevalence and types of infectious causes of abortion, modes of transmission, and methods of prevention and treatment.

Conclusions: abortion occurs during the first three months of pregnancy and is due to several reasons, including infection during pregnancy. This infection affects the pregnancy and causes many health problems for the mother and fetus that lead to abortion.



Keywords- TORCH infections, Listeria monocytogenes, zoonotic pathogens, vertical transmission, maternal–fetal infection.

I. INTRODUCTION

A spontaneous pregnancy loss before 20 weeks is referred to as an abortion (miscarriage), which used to be referred to as a spontaneous abortion (SA). Early miscarriage is the term for pregnancy loss that occurs in as many as one in five pregnancies during the first trimester (less than 12 weeks of gestation). One to two percent of pregnancies end

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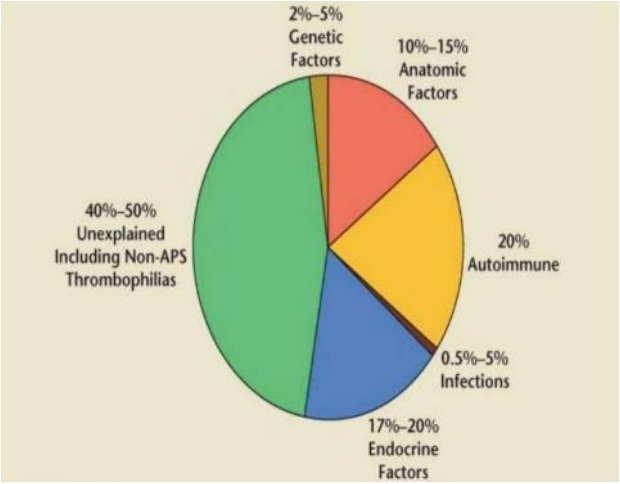
in a late miscarriage during the second trimester (12 to 24 weeks of gestation). Evidence suggests that easily treatable infections may cause up to 15% of miscarriages that occur early and up to 66% of miscarriages that occur late [2]. However, epidemiological research has found that 1% to 2% of women endure repeated pregnancy loss [3].



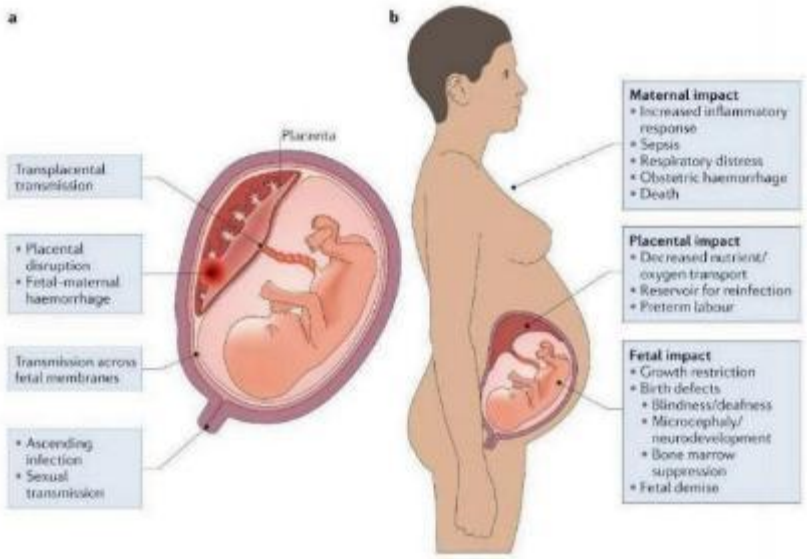
II. THE PATHOPHYSIOLOGY OF RECURRENT PREGNANCY LOSS

Depending on the gestational and maternal ages, the pathophysiology of recurrent pregnancy loss differs, yet many processes may ultimately converge on a single pathway that causes the pregnancy loss.

Chromosomal abnormalities, structural uterine abnormalities, and autoimmune diseases are typical mechanisms.

Pregnant women experience a decline in immunity due to changes in their endocrine systems, particularly a weakening of T lymphocyte immunological function, which makes them more vulnerable to contracting TORCH or having the virus reactivate in the future.

The majority of them had negative fetal outcomes but only modest maternal morbidity. The prevalence of these infections among pregnant subjects varies from one geographic region to another.



The TORCH group, which is an acronym made up of the first letters of the following pathogens' names names (Toxoplasma gondii, other pathogens, Rubella virus, Cytomegalovirus, Herpes simplex virus), is comprised of the primary pathogens that could cross the placenta after infecting a pregnant woman and cause severe harm to the fetus [7]. The majority of TORCH infections result in minor maternal sickness, while the fetal effects can be severe. [8]

Because the developing fetusg immune system is unable to fight off the infectious organism, maternal infections, particularly those that occur early in pregnancy, can cause fetal loss or abnormalities.

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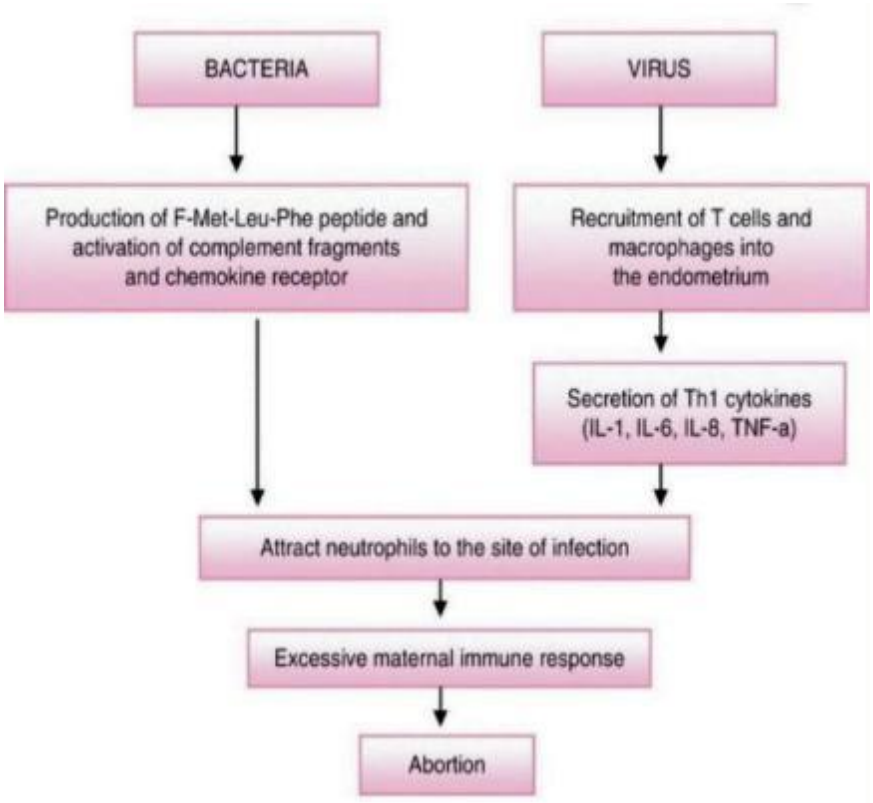
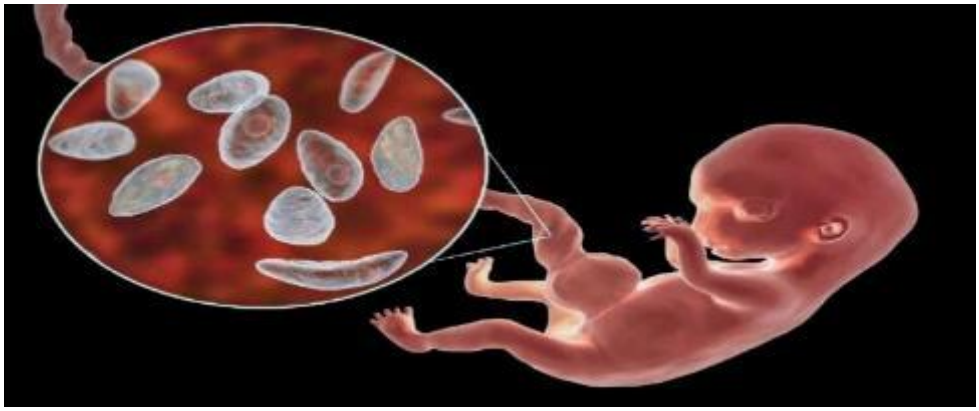
Numerous investigations have revealed a strong connection between maternal TORCH infections and pregnancy loss [9]. During pregnancy, the placenta limits vertical transfer and develops strong antimicrobial defense mechanisms. However, congenital disease]causing microbes have probably developed a variety of strategies to get around these defenses [10]. However, medication abortions that are self-managed are highly effective and safe throughout the first trimester[11]. Public health data shows that making safe abortion legal and accessible reduces maternal deaths[12].



III. TOXOPLASMOSIS

One of the TORCH pathogens, Toxoplasma gondii, is the only one that is not a virus [13], it occurs in people with immature or impaired immune systems, especially those with AIDS/ HIV, encephalitis and systemic infections [14]. Apart from immunocompromised patients whose pregnancy may result in abortion, stillbirth, decreased birth weight, or prematurity, recurrent infection in subsequent pregnancies is unusual. Primary infection with Toxoplasma gondii can cause fetal death and miscarriage. [15]. Toxoplasmosis infects humans widely and is almost endemic in all parts of the world [16]. The estimated risk of transmitting the infection to the fetus varies across the 1st, 2nd, and 3rd trimesters of pregnancy [17]. After transmission of Toxoplasma gondii through the placenta, the parasite enters to target organs such as immune] privileged sites like the brain, eyes, and liver [18] leading to miscarriage, stillbirth [19].



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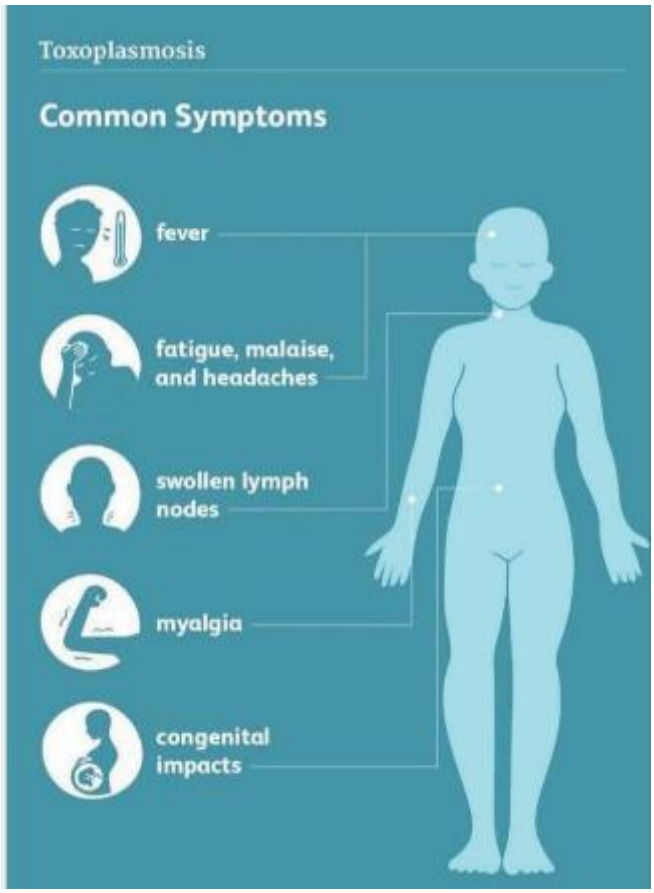
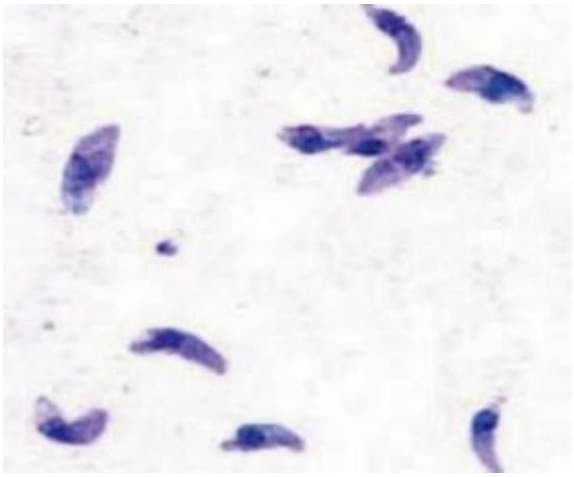
Symptoms

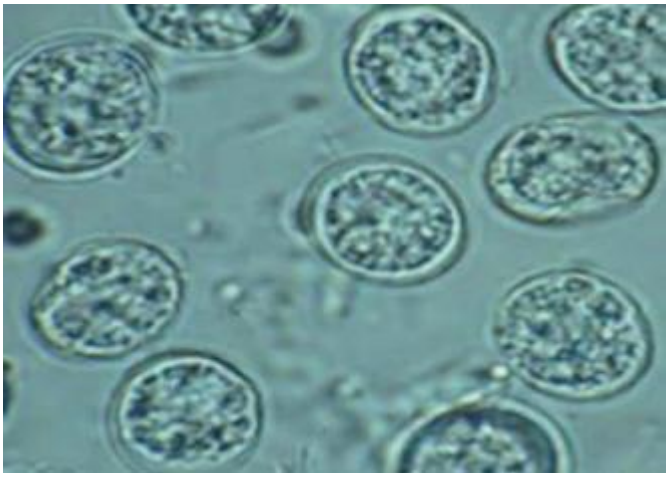
T.gondii can initially cause mild, flu]like symptoms in the first few weeks following exposure, but, healthy human adults are asymptomatic.[20]. Most infected women do not show symptoms [21]. However, if symptoms do occur, they usually develop 5 to 23 days after the infection [22] and are typically nonspecific and mild, including chills, fever, headache, sweats, sore throat, lymphadenopathy, hepatosplenomegaly, maculopapular rash, and myalgias [23].



Prevention

Humans can be exposed to oocysts by, for example, consuming unwashed vegetables or contaminated water, or by handling the feces (litter) of an infected cat.[24] Basic food handling safety practices can prevent or reduce the chances of becoming infected with T. gondii, such as washing unwashed fruits and vegetables, and avoiding raw or undercooked meat, poultry, and seafood. Other unsafe practices such as drinking unpasteurized milk or untreated water can increase odds of infection.[25]





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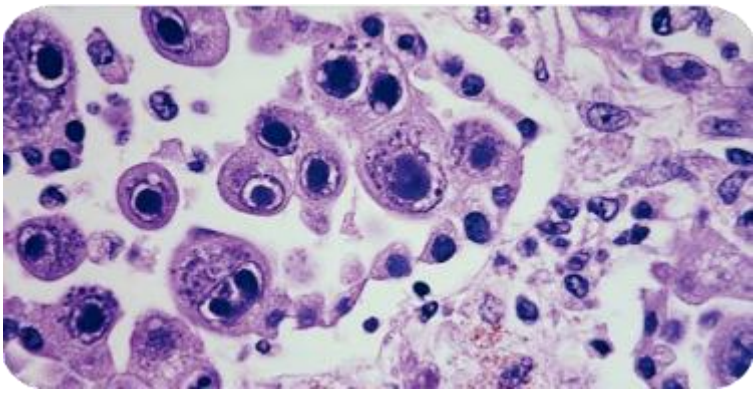
Treatment

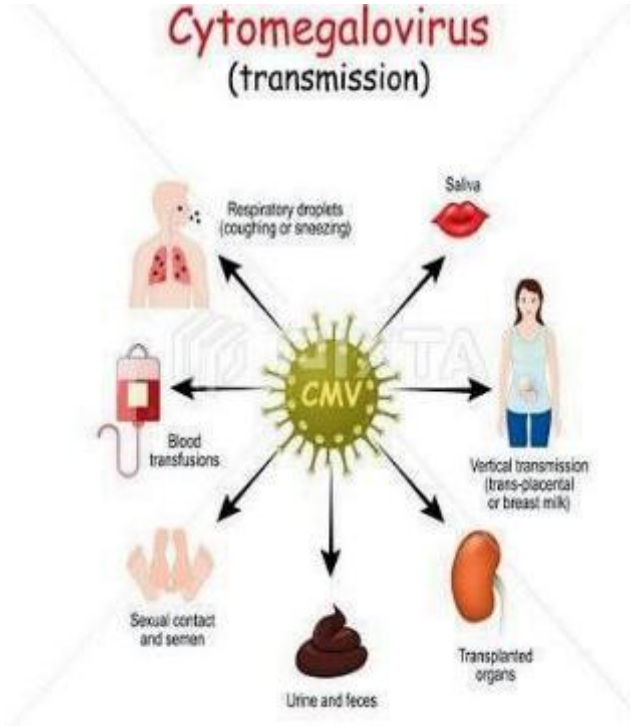
In humans, active toxoplasmosis can be treated with a combination of drugs such as pyrimethamine and sulfadiazine, plus folinic acid. Immune] compromised patients may need continuous treatment until/unless their immune system is restored.[26]. In primary maternal Toxoplasma infection, acquired during the first 18 weeks of gestation, it is recommended the treatment with spiramycin, a macrolide that reaches significant placental concentration, and can reduce the frequency of vertical transmission, but is not effective for the treatment of fetal infection [27].

Cytomegalovirus

Human CMV is the most studied of all Cytomegaloviruses [28]. The epidemiology and pathogenesis of infection with CMV in pregnancy have been studied over the past decades. Primary infection or reactivation of the previously acquired CMV can occur during pregnancy and can result in congenital CMV; the most important cause of congenital viral infections. If the child survives, up to 90% of the cases will have complications such as hearing loss, vision impairment and varying degrees of mental retardation.[29]. Whether primary infection or reactivation of CMV in a pregnant woman can cause pregnancy loss is still under discussion, results have been controversial, and underlying mechanisms [30].

CMV infection occurs when a seronegative mother becomes infected during pregnancy (in particular, during the first trimester) and transmits the virus to the foetus. In this situation, transmission to the fetus occurs in 30_35% of cases [9,11]. One prospective study also found a higher risk of pregnancy loss with CMV infection [31]. Transmission routes are depend on coming into contact with bodily fluids (such as saliva, urine, and genital secretions) from an infected individual.[32]





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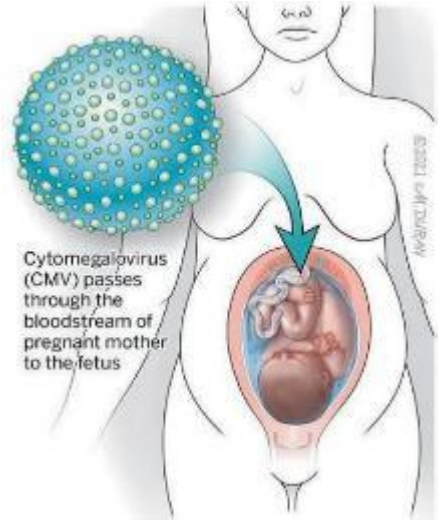
Symptoms:

It is reported that 80% to 95% of pregnant women with a primary infection develop no symptoms suggestive of a CMV infection, while the rest have mild, influenza-like symptoms [33]. The symptoms can be absent or mild, and they include a fever, commonly of unknown origin; rashes; pharyngitis; and lymphadenopathy. Paraclinical findings may show leukocytosis, anemia, thrombocytopenia, increased liver enzymes [34]. CMV infection can also cause pneumonia, encephalitis, neuropathy, hepatitis, posterior poll eye damage, digestive and urinary tract disease, and other conditions [35].



Treatment

Immunocompetent patients present with minimal or no symptoms and are self- limited and do not require specific therapy other than symptomatic management. However, antiviral therapy should be considered in severe cases of CMV infection, and in immunocompromised patients. Several antiviral agents have been approved for the treatment of CMV (cidofovir, foscarnet, ganciclovir, valganciclovir)[36].

IV. MALARIA

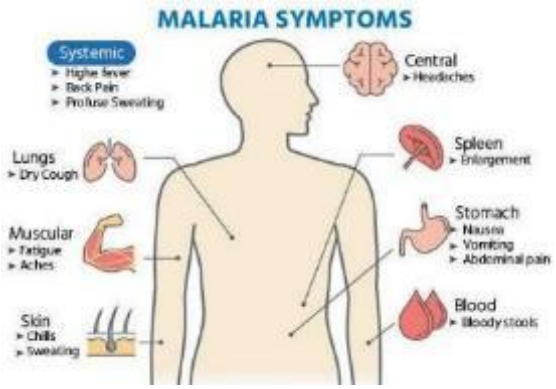
Define of Malaria:

Malaria is a disease caused by a parasite. The parasite is transmitted to humans through the bite of infected mosquitoes. People with malaria usually feel very ill, with a high temperature and chills accompanied by tremors[37].

Signs and Symptoms of Malaria:

The attack usually begins with shivering and chills, then a high fever, then sweating, then a return to normal temperature. Signs and symptoms of malaria usually begin within a few weeks after being bitten by an infected mosquito. However, some types of parasites that cause malaria can remain dormant in your body for up to a year[38].

Women with malaria associated with pregnancy may have normal malaria symptoms, but they may also have no visible symptoms or have mild symptoms, including a lack of characteristic fever. This may prevent a woman from seeking treatment despite the risk to herself and her unborn child[39].



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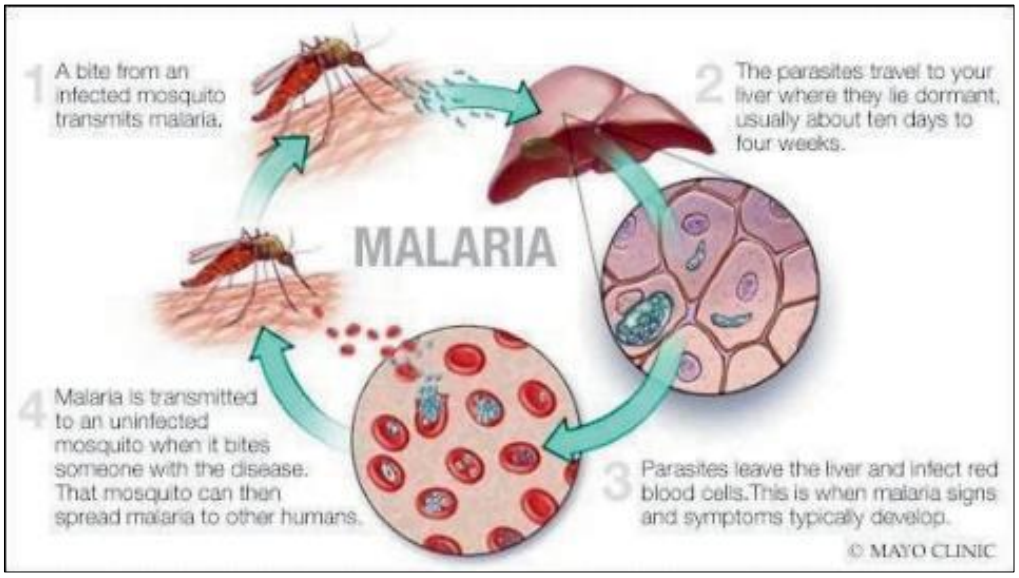
Malaria transmission cycle:

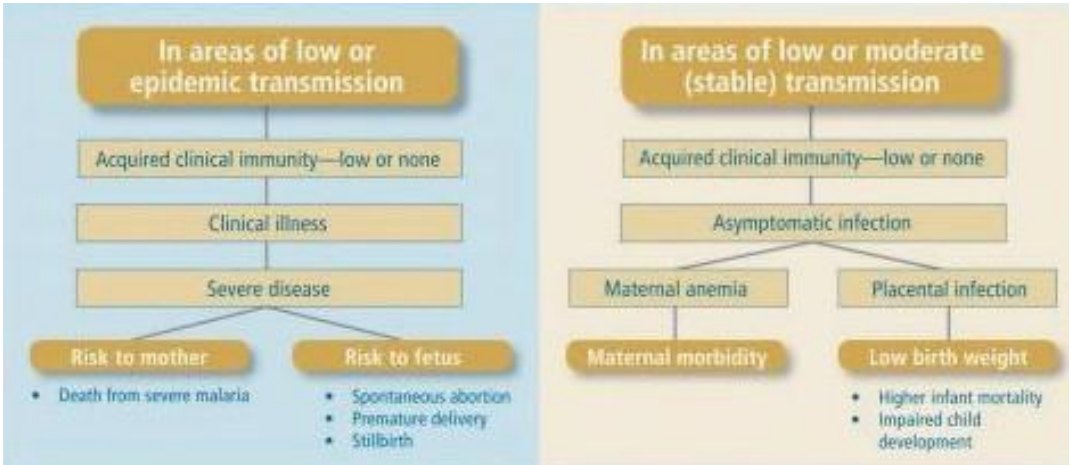
Malaria is spread when mosquitoes become infected with the disease after biting an infected person, and then the infected mosquito bites an uninfected person. Malaria parasites enter the infected person's bloodstream and travel to the liver. When the parasites become mature, they leave the liver and infect red blood cells[37].



Reasons effect on fetus:

The disease results from the accumulation of red blood cells infected with Plasmodium falciparum, which has been shown to adhere to chondroitin sulfate A on placental proteoglycans, causing their accumulation in the interspaces of the placenta, thus impeding the important flow of nutrients from the mother to the fetus[39].

Malaria during pregnancy:



Treatment:

Treatment can be chosen according to the patient's condition and health condition, in cooperation with the gynecologist and internist. During treatment, blood strength must be monitored, and the kidneys, sugar, and bilirubin must be examined.

Types of treatments:

1. Treatment that can be used during the entire period of pregnancy: chloroquine, quinine, artesunate, artemether, arteether.
2. Treatment that can be used from the 13th-28th week: mefloquine, pyrimethamine, sulfadoxine.
3. Treatment that can be used between weeks 29-40: mefloquine, pyrimethamine, sulfadoxine.

As for the medications that cannot be used at all during pregnancy, they are: primaquine, tetracyclin, doxycycline, halofantrine [40].

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V. BRUCELLA BACTERIA (BRUCELLOSIS)

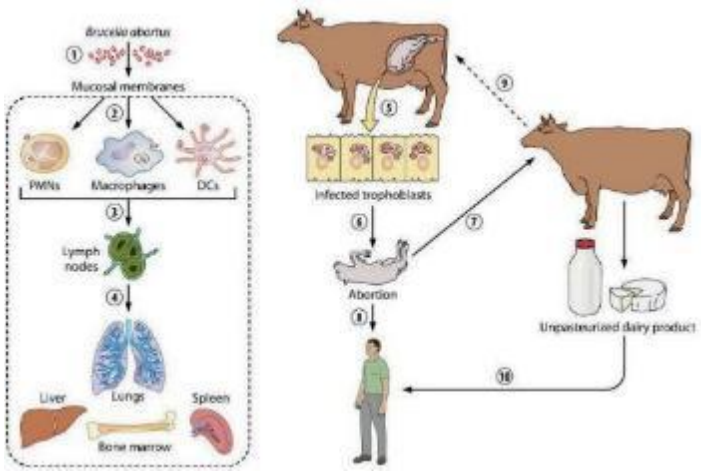
Definition of Brucellosis:

Brucellosis is an infection caused by several species of Brucella (Gram-negative bacteria Brucella), characterized by fever and symptoms throughout the body.

Brucellosis may cause intrauterine fetal death or stillbirth, particularly when infection occurs during early or mid-pregnancy [41].

Miscarriage

Brucellosis may cause miscarriage, especially if the condition is not treated and controlled[41].



Symptoms of Brucellosis for pregnant women:

Symptoms of brucellosis appear within a few days to months of exposure to the bacteria causing the condition, and initially cause flu-like symptoms.

Fever, excessive sweating, chills, feeling sick and tired, loss of appetite, headache, back, muscle or joint pain [42].

Prevention of Brucellosis

Since there is no vaccine that protects against brucellosis; Prevention is early detection and taking the necessary treatment as quickly as possible, as this is effective in avoiding any complications that may affect the pregnant woman or the fetus. Here are some ways to help you prevent brucellosis:

- Avoid eating raw meat and unpasteurized products, such as cheese and milk.
- Wear gloves and protective glasses when handling infected animals, animal tissues, or animal waste.
- Cover wounds, especially open wounds, in case of exposure to blood, urine, or animal feces.
- Giving household animals the brucellosis vaccine intended for animals if you are one of those who care for household animals [42].

Treatment of brucellosis:

Brucellosis is treated with antibiotics effective against brucella bacteria and the doctor often recommends two types of antibiotics for pregnant women for a period of 6–8 weeks; They are rifampicin and trimethoprim/sulfamethoxazole (TMP]SMX)[42].

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Chlamydia

- Infective organism
- Chlamydia trachomatis is an obligate intracellular organism.

Prevalence

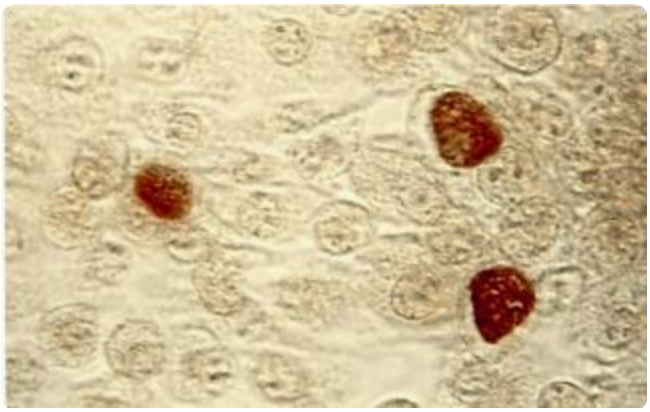
Chlamydia is the commonest sexually transmitted organism in the UK and USA. Between 1 in 8–10 men and women who are sexually active and under 25 years. old screen positive for chlamydia and there are over 120,000 cases diagnosed in women per year in the UK[43].

Clinical features

- Chlamydia is frequently asymptomatic in the pregnant woman.
- Infection with chlamydia is associated with preterm rupture of membranes, preterm delivery and low birthweight.
- Transmission to the fetus occurs at the time of delivery and can cause conjunctivitis and pneumonia.[44]

Management

- Treatment with azithromicin or erythromycin is recommended.
- Tetracyclines such as doxycycline should be avoided if possible during pregnancy. Appropriate contact tracing can be arranged via a GUM clinic [44]



Gonorrhoea

Infective organism : Neisseria gonorrhoeae is a gram-negative diplococcus.

Prevalence

The prevalence of gonorrhoea in pregnancy varies with the population studied. In the UK it is the second most common bacterial sexually-transmitted disease, with around 8,000 cases per year in women[45]

Clinical features

Gonococcal infection in women is frequently asymptomatic, or women may present with a mucopurulent discharge or dysuria. Rarely disseminated gonorrhoea may cause low-grade fever, a rash and polyarthritis. There is an increased risk of coinfection with chlamydia and an increased risk of preterm rupture of membranes and preterm birth. Transmission to the fetus occurs at the time of delivery and can cause ophthalmia neonatorum [46].

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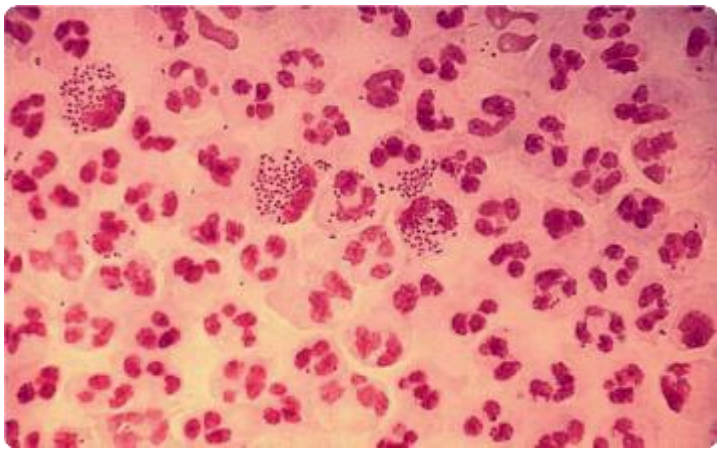
Management

Bacteriological swabs should be taken and specific swabs/testing for concomitant infection with chlamydia should also be undertaken. Cephalosporins are effective against gonococcus, but empirical treatment for chlamydia should also be considered. Appropriate contact tracing can be arranged via a GUM clinic[46]



Herpes

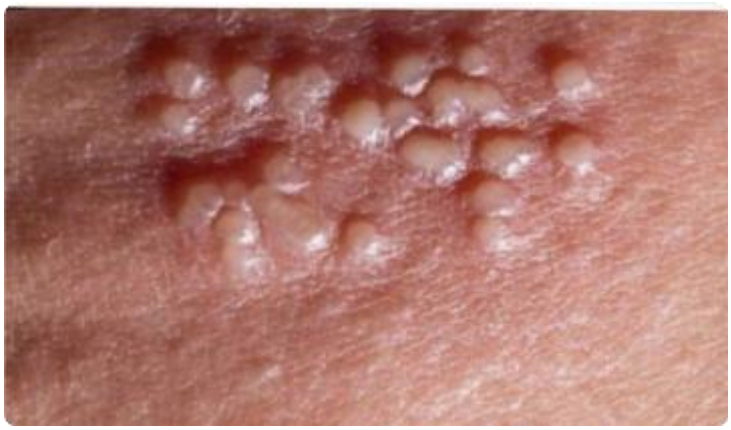
Infections acquired around the time of delivery with serious neonatal consequences Herpes Infective organism Herpes simplex virus (HSV) is a double-stranded DNA virus. There are two viral types, HSV-1 and HSV-2. The majority of infections are caused by HSV are usually acquired during childhood through direct physical contact such as kissing. Genital herpes is a sexually transmitted infection and is most commonly caused by HSV-2[47]

Clinical features

Genital herpes presents as ulcerative lesions on the vulva, vagina or cervix. The woman may give a history of this being a recurrent problem. A primary infection may be associated with systemic symptoms and may cause urinary retention[47]

Management

Symptomatic genital herpes infections are confirmed by direct detection of HSV. A swab for viral detection should be used. Any woman with suspected first- episode genital herpes should be referred to a genitourinary physician, who will confirm the diagnosis by viral culture or PCR. The use of aciclovir is recommended (400 mg three times daily) and is associated with reduction in the duration and severity of symptoms and a decrease in the duration of viral shedding. It is well tolerated and considered safe in pregnancy[48].



VI. CONCLUSIONS

Miscarriage occurring during the first three months of pregnancy may result from infectious causes. Evidence shows that many infections are acquired due to inadequate preventive measures, such as exposure to contaminated food, animal contact, or other transmission routes.

The pregnant woman must conduct periodic examinations to ensure Her safety and the safety of the fetus, which is one of the most important factors of prevention, and we must pay attention to the reproductive system because

it is the source from which bacteria, viruses, and diseases are transmitted, and from the infections that cause diseases that are difficult to treat or cannot be treated, and thus affect the fetus. So Medications may help prevent miscarriage and support normal fetal development when administered appropriately.

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