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COURSE: EMBRYOLOGICAL MECHANISM AND TERATOLOGY AND
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ASSIGNMENT

1. From our understanding of teratology, can we say Coronavirus is a teratogen and if No/ Yes, Justify your answer.

No, coronavirus (COVID-19) cannot be said to be a teratogen yet. A teratogen refers to any agent that can disturb the development of an embryo or fetus and may cause a birth defect in a child. As of now, research hasn't shown corona virus in pregnant women causing any birth defects/ anomalies in their children.

There appears to be some risk of premature rupture of membranes, preterm delivery, fetal tachycardia and fetal distress when the infection occurs in the third trimester of pregnancy. However, limited data obtained from cases of pregnant women with COVID-19 suggest that the transplacental transmission is unlikely in the late term of pregnancy (3rd trimester), as the virus was not identified in the amniotic fluid, cord blood, neonatal throat swab, placenta, breast milk of mothers or in the nasal secretions of their neonates. Whether virus shedding occurs vaginally is also not known.

Whether COVID-19 increases the risk of miscarriage and stillbirth is unknown. Concerns have been expressed by experts in the media about women undergoing termination of pregnancy for fear of congenital infection and teratogenicity. However, information on the effect of COVID-19 on the course and outcome of pregnancy in the first and second trimesters is not available yet.

2. What are the impacts of ageing and environment in the outbreak of this novel COVID-19?

The Impact of Ageing

The novel coronavirus (COVID-19) has been seen to be lethal in people of older age. People over the age of 50 years and those with chronic diseases are the most vulnerable. Statistics has shown that for individuals over 80 years, approximately 15% of those infected will die. According to the CDC in the United States, 8 out of 10 deaths reported have been in adults 65 years and older.

Why are older individuals at a higher risk?

As we age, our immune system weakens. This makes us more vulnerable to infections of all types. And any sort of challenge to the body can do more damage. When the immune system gears up in older people, there is also a higher likelihood of a phenomenon called a cytokine storm. This is where the immune system

overreacts and produces too many of the chemicals to fight an infection. So, you get a severe inflammatory reaction which has the potential to cause significant damage in the body, including organ failure.

The Impact of Environment

The environment mainly affects how the virus can be spread and how the virus is able to survive. The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or speaks. These droplets are too heavy to hang in the air. They quickly fall on floors or surfaces. An individual can be infected by breathing in the virus if they are within 1 meter of a person who has COVID-19, or by touching a contaminated surface and then touching the eyes, nose or mouth before hand washing or use of alcohol-based hand sanitizers.

It is not certain how long the virus that causes COVID-19 survives on surfaces, but it seems to behave like other coronaviruses. Studies suggest that coronaviruses (including preliminary information on the COVID-19 virus) may persist on surfaces for a few hours or up to several days. This may vary under different conditions (e.g. type of surface, temperature or humidity of the environment).

3. Summarize the importance of Oogenesis and Spermatogenesis.

During Spermatogenesis, one spermatogonium produces four sperms, Sperms have half the number of chromosomes. After fertilization, the diploid chromosome number is restored in the zygote. It maintains the chromosome number of the species. During meiosis I crossing over takes place which brings about variation, Spermatogenesis occurs in various organisms. Thus, it supports the evidence of the basic relationship of the organisms.

During Oogenesis, one oogonium produces one ovum and three polar bodies. Polar bodies have small amount of cytoplasm. It helps to retain sufficient amount of cytoplasm in the ovum which is essential for the development of early embryo. Formation of polar bodies maintains half number of chromosomes in the ovum. During meiosis first crossing over takes place which brings about variation. Oogenesis occurs in various organisms. Therefore, it supports the evidence of basic relationship of the organisms.

4. Describe what you understand by personal hygiene and disaster; hence state their correlation if there any.

Personal hygiene refers to those practices performed to maintain the body's cleanliness and in the long run preserve health. **Disaster** on the other hand, is a serious disruption occurring over a short or long period of time that causes widespread human, material, economic or environmental loss which may exceed the ability of the affected community or society to cope using its own resources.

In this context, a correlation between these two stems from a disaster probably being a virus, such as the coronavirus. To prevent a virus outbreak becoming a disaster, it is very important to practice personal hygiene. If people do not practice it, the spread of such viruses becomes easier and faster and would lead to a large number of

individuals becoming sick and even worse causing death. For example, in the prevention of the spread of the coronavirus, the following personal hygiene steps should be taken by individuals:

- Clean your hands often. Use soap and water, or an alcohol-based hand sanitizer.
- Cover your nose and mouth with your bent elbow or a tissue when you cough or sneeze.
- Dispose of such tissues properly immediately.