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COURSE: ANA 308(Embryological Mechanism and Teratology and Reproductive Techniques) Assignment

Questions

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

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

3. Summarize the importance of oogenesis and spermatogenesis.

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

Answer

1. Corona virus is not a teratogen. Teratogens are substances that may produce physical or functional defects in the human embryo or fetus after the pregnant woman is exposed to the substance. There is no evidence to suggest that Corona virus is teratogenic i.e would induce congenital formalities.

The novel Corona virus (SARS-COV-2) is a new strain of Corona virus causing Covid-19. There is no strong evidence of any negative effects of Covid-19 infection on eggs, sperm, embryos or pregnancies( especially those at early stages) as indicated by the latest updates from the Centers for Diseases Control and Prevention(CDC) in the USA and the Royal College of Obstetricians and Gynecologists (RCOG) in the UK.

Transmission: Most cases of Covid-19 worldwide have shown evidence of human transmission. The virus can be found in respiratory secretions, feces and fomites. There are currently two ways in which Covid-19 can spread:

• Directly from close contact with an infected person (within 2 meters), as respiratory secretions can enter the eyes, mouth, nose or airways. The risk increases the longer someone has close contact with an infected person who has symptoms.

• Indirectly, by touching a surface or object (or hand of an infected person) that has been contaminated with respiratory secretions and then touching one’s own mouth, nose or eyes.

Pregnant women, at present, do not appear to be more likely to contract the virus than the general population. But, during pregnancy the body’s immune system is weakened (in both naturally conceived and ART conceived pregnancies) and as such response to viral infections in the pregnancy. This is known as vertical transmission and emerging evidence suggests that although likely, the proportion of pregnancies affected and the consequences to the newborn have yet to be determined. There are a few reported cases of women positive for Covid-19, who have delivered healthy infants free of the disease. On the other hand, there have also been reports of adverse outcomes (premature rupture of membranes and preterm delivery) in infants born to mothers positive for Covid-19 during their pregnancy. Until very recently, there was just one case report published of an infected newborn, but with no strong evidence that this was the result of vertical transmission. However, a new report published on 26th march 2020, describes a newborn birthed to a Covid-19 positive mother, which was found to have SARS-COV-2 IgM in serum at birth. This represents a clear indication of a neonatal immune response to an in-utero infection, as IgM does not cross the placenta. Most data refer to pregnancies in their final stages, but there is very little information on the possible effects of Covid-19 infection on pregnancies in their initial stages, hence the concern for those planning pregnancies around this period. There is currently no data to suggest there is an increased risk of miscarriage or early pregnancy loss in relation to Covid-19, it is still unclear whether these cases were spontaneous or a result of the viral infection.

2. Impact of ageing in the outbreak of this novel COVID-19: The COVID-19 pandemic is impacting the global population in drastic ways. In many countries, older people are facing the most threats and challenges at this time. Although all age groups are at risk of contracting COVID-19, older people face significant risk of developing severe illness if they contract the disease due to physiological changes that come with ageing and potential underlying health conditions. Older adults are at a significantly increased risk of severe disease following infection from COVID-19. Over 95% of these deaths occurred in those older than 60 years. More than 50% of all fatalities involved people aged 80 years or older.

 Impact of environment in the outbreak of this novel COVID-19

There has been much progress about the potential climate impact of the Corona virus related shutdown. Data from the Sentinel-5P-satellite shows that nitrogen dioxide air pollution levels have plummeted across Europe since the pandemic. NO2 is emitted in most cases by burning fossil fuels at high temperatures, as in internal combustion engines. Short term air pollution, which lasts for a few hours or a few days in the atmosphere, has dropped, and that is considered positive news. The pandemic has led Italy to ban infected residents from sorting their waste at all which has inhibited recycling. Many corporations have overturned disposable bag bans and begun relying once again on single-use plastics, and many restaurants are no longer accepting reusable containers. Furthermore, with more and more consumers isolated at home, there has been an increasing number of online purchases and meal deliveries made. This has not only caused the disposal of more single-use plastic packaging, but has further required more fossil fuels to be burned for the individual transportation and distribution of goods. There has also been an increase in medical waste – much of the personal protective equipment that healthcare professionals are using can only be worn once before being disposed of. Even if mass isolation were aiding in the reduction of climate change, it would not be a sustainable way of cleaning up the environment. Unemployment is reaching record highs and trillions have been pledged by governments to help restore their economies.

3. Importance of spermatogenesis and oogenesis

Spermatogenesis:

• Provide haploid motile sperm

• Held in causing variations in offspring

 Oogenesis:

• Provide haploid ovum

• Most of the cytoplasm is retained in the functional ovum

• Variations may occur due to crossing over during meiosis 1

4. Personal hygiene involves those practices performed by an individual to care for one’s bodily health and wellbeing through cleanliness. Motivations for personal hygiene practice include reduction of personal illness, optimal health and sense of wellbeing, social acceptance and prevention of spread of illness to others. Practices that are generally considered proper hygiene include showering or bathing regularly, washing hands regularly and especially before handling food, washing scalp hair, wearing clean clothes, brushing teeth, beside other practices.

A disaster is a serious disruption occurring over a short or long period of time that causes widespread human, material, economic or environmental loss which exceeds the ability of the affected community or society to cope using its own resources. Three types of disasters are:

• Natural – hurricanes, tornados, earthquakes, floods, volcanoes e.t.c

• Technological – chemical releases, power outages, natural gas explosion, e.t.c

• Man-made – terror attacks, race riots, mass shootings, e.t.c

The correlation of personal hygiene and disaster: During or after a major disaster, the risk of becoming ill from disease or infection go way up. The maintenance of personal hygiene and a hygienic environment are the biggest priorities after or during a disaster. Being clean is the best way to prevent yourself from getting ill during this time. Washing hands, brushing teeth, and taking showers are the first line of defense against disease. Clean hands saves lives in emergency situations. Cleaning and sanitizing of hands are the best method to keep illness free at an extremely stressful time.