



Nipah virus Infection (NiV)

For Prelims: Nipah virus Infection, IgG, IgM, IgA, IgD, IgE, zoonotic virus, Ribonucleic acid virus, encephalitic syndrome

For Mains: Achievements of Indians in Science & Technology

Why in News?

Recently, Scientists detected the **presence of IgG antibodies against Nipah virus infection (NiV)** in 51 bats that were captured from Karnataka, Kerala, Tamil Nadu and Puducherry.

What is Antibody?

- Antibody, also called immunoglobulin, is a **protective protein produced by the immune system** in response to the presence of a foreign substance, called an antigen.
- A wide range of substances are **regarded by the body as antigens**, including disease-causing organisms and toxic materials.
- Antibodies recognize and attack onto antigens in order to remove them from the body.

What are the Different Types of Antibodies?

- **IgG:**
 - It is the **main antibody in blood and it has a powerful ability to bind to bacteria and toxins**, and thus it takes on an important role in the biological defense system.
 - It is the **only isotype that can pass through the placenta**, and IgG transferred from the mother's body protects a newborn.
- **IgM:**
 - It is **constructed of five units of basic Y-shaped structures** and is mainly distributed to the blood. Produced first upon pathogen invasion by B cells, IgM has a key role in the initial immune system defense for protecting the body.
 - The B-cell, also called B-lymphocyte, is a type of white blood cell that plays a significant role in protecting your body from infection.
- **IgA:**
 - While in blood, **IgA is mainly present as monomers** (the shape of a single Y), but it forms dimers (a combination of 2 Ys) in secretions such as bowel fluid, nasal discharge, and saliva, to prevent bacterial invasion from a mucous membrane. It is also present in breast milk and protects the gastrointestinal tract of newborns from bacterial and viral infection.
- **IgD:**
 - It is **present on the surface of B cells** and it is reported to play a role in the induction of antibody production and the prevention of respiratory tract infections.
- **IgE:**
 - It is believed that **IgE was originally related to immunity reactions to parasites**. By binding to mast cells, **IgE is believed to be involved in allergies such as pollinosis**.

What are the Key Highlights about the Nipah virus?

▪ About:

- It is a **zoonotic virus** (it is transmitted from animals to humans).
- The organism which causes Nipah Virus encephalitis is an RNA or **Ribonucleic acid virus** of the family Paramyxoviridae, genus Henipavirus, and is closely related to Hendra virus.
 - **Hendra virus (HeV) infection** is a rare emerging zoonosis that causes severe and often fatal disease in both infected horses and humans.
- It **first broke out in Malaysia and Singapore** in 1998 and 1999.
- It **first appeared in domestic pigs** and has been found among several species of domestic animals including dogs, cats, goats, horses and sheep.

▪ Transmission:

- The disease spreads through **fruit bats** or 'flying foxes,' of the genus Pteropus, who are natural reservoir hosts of the Nipah and Hendra viruses.
- The **virus is present in bat urine** and potentially, bat faeces, saliva, and birthing fluids.

▪ Symptoms:

- The human infection presents as an **encephalitic syndrome** marked by fever, headache, drowsiness, disorientation, mental confusion, coma, and potentially death.

▪ Prevention:

- Currently, there are **no vaccines for both humans and animals**. Intensive supportive care is given to humans infected by Nipah virus.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Consider the following statements: (2017)

1. In tropical regions, Zika virus disease is transmitted by the same mosquito that transmits dengue.
2. Sexual transmission of Zika virus disease is possible.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (c)

- Zika virus is a flavivirus which was first discovered in 1947 in monkeys and then in humans in Uganda in 1952.
- Both Zika and Dengue have similarities in terms of symptoms of fever, skin rashes, conjunctivitis, muscle and joint pain, malaise, and headache. In addition to this, the mode of transmission is also same for both the diseases, i.e., both are spread by *Aedes aegypti* and *Aedes albopictus* species of mosquitoes.
- Modes of Zika Transmission:
 - Mosquito bites
 - From mother to child during pregnancy, which can cause microcephaly and other severe fetal brain defects. Zika virus has also been found in breast milk.
 - Sexual transmission from infected partner.

Q. H1N1 virus is sometimes mentioned in the news with reference to which one of the following diseases? (2015)

- (a) AIDS
- (b) Bird flu
- (c) Dengue
- (d) Swine flu

Ans: (d)

- H1N1 virus is related to Swine Flu.
- The World Health Organization declared the flu caused by H1N1 to be a global pandemic in 2009.
- Symptoms of Swine Flu include fever, cough, sore throat, chills, weakness and body aches.

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