



Japanese Encephalitis

Why in News?

A study conducted in **Gorakhpur district, India**, involving 266 children vaccinated with the Chinese SA-14-14-2 vaccine ([a live, attenuated vaccine](#)) for [Japanese encephalitis](#), found very low levels of **neutralising antibodies IgG** at different time points after vaccination.

- However, the study did not measure **cell-mediated immune responses** ([T-cell immune responses](#))

What does the Study on Vaccine for Japanese Encephalitis Suggest?

- **About:**
 - The study found that **seroprotection** against the virus decreased in the vaccinated children.
 - **Seroprotection** is an antibody response capable of preventing infection, e.g., after a vaccination or a previous infection with a microorganism.
 - Nearly **98% of the children who received the vaccine did not have any IgG antibodies** against the virus.
 - **Similar results were seen in a study carried out in Bangladesh**, where children were immunised with the Chinese vaccine.
- **Comparison with Other Vaccine:**
 - In contrast, a trial carried out using an **inactivated vaccine** ([Jenvac](#)), developed by [Bharat Biotech](#) in collaboration with NIV Pune has **found superior protection** at the end of two years even with a single dose.
 - Jenvac has been approved as a **single-dose vaccine**.
 - The **November 2020** trial found that **two doses of Jenvac** produced more antibodies than two doses of the Chinese vaccine.

What is Japanese Encephalitis?

- **About:**
 - **Japanese Encephalitis (JE)** is a **viral infection** that can cause inflammation in the **brain**.
 - It is caused by a flavivirus that **belongs to the same genus as dengue, yellow fever and West Nile viruses**.
 - Japanese encephalitis virus (JEV) is also a major cause of [Acute Encephalitis Syndrome \(AES\)](#) in India.
- **Transmission:**
 - The disease is transmitted to humans through bites from **infected mosquitoes** of the **Culex species**.
 - These mosquitoes breed mainly in **rice fields** and large water bodies rich in **aquatic vegetation**.
- **Treatment:**
 - There is **no antiviral treatment for patients** with JE.
 - Treatment, available, is **supportive to relieve symptoms** and stabilise the patient.

▪ **Prevention:**

- **Safe and effective JE vaccines** are available to prevent the disease.
- **JE vaccination** is also included under the **Universal Immunisation Program** of the Government of India.





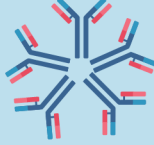
What are Antibodies?

- **About:** An **antibody is a protein produced by the body's immune system** when it detects harmful substances, called antigens.
- **Types:** There are **5 types of heavy chain constant regions** in antibodies (immunoglobulin) and according to these types, they are classified into IgG, IgM, IgA, IgD, and IgE.
 - **IgG 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.**

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5 Types of Antibodies

Antibodies or immunoglobulins (Ig) are Y-shaped proteins that recognize unique markers (antigens) on pathogens.

 <p>IgA</p> <p>Secreted into mucous, saliva, tears, colostrum. Tags pathogens for destruction.</p>	 <p>IgD</p> <p>B-cell receptor. Stimulates release of IgM.</p>	 <p>IgE</p> <p>Binds to mast cells and basophils. Allergy and antiparasitic activity.</p>	 <p>IgG</p> <p>Binds to phagocytes. Main blood antibody for secondary responses. Crosses placenta.</p>	 <p>IgM</p> <p>Fixes complement. Main antibody of primary responses. B-cell receptor. Immune system memory.</p>
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UPSC Civil Services Examination, Previous Year Question (PYQ)

Q.1 Which one of the following statements best describes the role of B cells and T cells in the human body?(2022)

- (a) They protect the environmental allergens. body
- (b) They alleviate the body's pain and inflammation.
- (c) They act as immunosuppressants in the body.
- (d) They protect the body from the diseases caused by pathogens

Ans: (d)

Q.2 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)

[Source: TH](#)

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