South African Variant of Coronavirus

Why in News

Recently, the **World Health Organisation (WHO)** has raised a concern over the **South African variant of Coronavirus.**

Key Points

- **About:**
  - South Africa named the variant **501Y.V2** because of the **N501Y mutation** they **found in the spike protein** that the virus uses to gain entry into cells within the body.

    Changes in spike protein could possibly **affect how the virus behaves in terms of its ability to infect, or cause severe disease, or escape the immune response** made by vaccines.
  - This mutation was also found in the **new strain that the UK** notified WHO..
    - While the mutant virus from the UK **also has the N501Y mutation, phylogenetic analysis has shown that 501Y.V2 from South Africa are different virus variants.**
    - **Phylogenetic analysis** is the study of evolutionary development of a species or a group of organisms or a particular characteristic of an organism.
- **Concerns:**

  Preliminary experiments have shown that **monoclonal antibodies** that were effective against SARS-CoV2 are **less effective against the South Africa variant.**
- **Effect of Vaccination:**

  The serum of persons who have been administered the Covid vaccine is now being tested in labs in the UK and South Africa **to check whether it can neutralise the South African strain.**

- **Tracking Mutation in Virus:**
  Global scientific collaboration and public genomic sequence databases like Global **Initiative on Sharing All Influenza Data (GISAID) enables** WHO and partners to track the virus from the beginning.
    - **GISAID** is a **public platform** started by the WHO in 2008 for countries **to share genome sequences.**
    - The GISAID Initiative **promotes the international sharing of all influenza virus sequences, related clinical and epidemiological data associated with human viruses,** and geographical as well as species-specific data associated with avian and other animal viruses.
- **Mutant Variant in India:**
  India reported a total of **82 persons with new UK mutant strain** and presently there are **no reports on the South African mutant.**
- **Earlier Mutation:**
    - **D614G Mutation:**
        - This particular mutation aided the virus in attaching more efficiently with the ACE2 receptor in the human host, thereby making it more successful in entering a human body than its predecessors.
        - D614G showed **increased infectivity but it also displayed greater ability at attaching itself to the cell walls** inside an individual's nose and throat, increasing the viral load.
    - **N501Y mutant:**
        - In this case there has been a **single nucleotide change in one portion of the spike protein,** so there would be no bearing on the disease biology or even diagnostics.
        - There is **no evidence that this strain is more transmissible or more severe/resistant** to treatment or vaccination.

Mutation

- A mutation means a change in the genetic sequence of the virus.
- In the case of **SARS-CoV-2,** which is an **Ribonucleic acid (RNA)** virus, a mutation means a **change in the sequence in which its molecules are arranged.**
    - **SARS-CoV-2** is the virus that causes **Covid-19.**
    - **RNA** is an **important biological macromolecule** that is **present in all biological cells.**
      Principally **involved in the synthesis of proteins, carrying the messenger instructions from Deoxyribonucleic Acid (DNA)**, which itself contains the genetic instructions required for the development and maintenance of life.
    - **DNA** is an **organic chemical that contains genetic information and instructions for protein synthesis.** It is found in most cells of every organism.

- A mutation in an RNA virus often happens when the virus makes a **mistake while it is making copies of itself.**
    - Only if the mutation results in a **significant change in the protein structure can the course of a disease be altered.**

Source:IE