Keytruda, a cancer drug

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Why in News?

- Keytruda (pembrolizumab) is a widely used ***immunotherapy*** manufactured by Merck & Co.
- **Inhibitor drug -** It belongs to a class called ***"checkpoint inhibitors",*** drugs that remove the brakes preventing the body's T cells.

  T cells are a crucial weapon in the body's immune system, from attacking cancerous cells.

- **Category -** Keytruda belongs to the category of monoclonal antibodies, which are laboratory-made molecules designed to bind with specific targets, enabling the immune system to identify and destroy cancerous cells.
- **Mechanism -** It uses the body's own immune system to fight cancer.
- It acts as a checkpoint inhibitor, allowing T-cells to identify and destroy cancer cells.
- It works by attaching to receptors called PD-1 on T cells.
- This prevents T cells from binding with corresponding PD-L1 receptors on cancer cells, letting them identify the abnormal cells and triggering an immune response.
- **First approved by -** The United States FDA in 2014 for advanced skin cancer.
- It is the best-selling drug globally.
- **Treatment -** It is effective in treating
  - **Lung Cancer -** Non-small cell (NSCLC) and small cell lung cancer (SCLC).
  - **Skin Cancer -** Melanoma, cutaneous squamous cell carcinoma, and Merkel cell carcinoma.
  - **Other Cancers-** Head and neck, breast (triple-negative), bladder

(urothelial), cervical, colorectal, gastric, liver, renal cell carcinoma, and classical Hodgkin lymphoma.

- **Administration-** It is given via intravenous (IV) infusion over 30 minutes every 3 or 6 weeks.
- A newer subcutaneous (injection under the skin) formulation is also available.
- **Other Immunotherapies available in India -** Several monoclonal antibodies, including Keytruda, are available in tertiary care hospitals across India.
- Generic versions of some monoclonal antibodies exist, including *trastuzumab and nivolumab*, another PD-1 checkpoint inhibitor.
- **CAR-T therapy** remains cost-intensive and technology-driven.
- ImmunoAct, an IIT-Bombay incubated startup, developed India's first indigenous CAR-T therapy called **NexCar19**, currently the most readily available option in the country.
- Keytruda is utilized for advanced or metastatic cases, often as a first-line treatment.

Reference

The Indian Express | Keytruda

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