Acute Promyelocytic Leukemia (APL)

Prelims – *Current events of national and international importance| General Science.*

Mains (GS III) – *Science and Technology – Developments and their applications and effects in everyday life.*

Why in News?

The new test, RAPID-CRISPR developed using CRISPR technology can quickly and accurately diagnose acute promyelocytic leukemia (APL).

- It is a rare but serious ***blood cancer*** characterized by the abnormal accumulation of immature white blood cells called promyelocytes, often leading to severe bleeding and clotting problems.
- It is classified as a subtype of Acute Myeloid Leukemia (AML), a cancer of the blood-forming tissue (bone marrow).
- It accounts for about **10-15%** of newly diagnosed AML cases.
- **Common symptoms**
  - Sudden bleeding from the gums and nose
  - Fatigue
  - Unexplained fever
  - Bone pain
- While these symptoms may mimic those of other conditions, definitive diagnosis relies on histopathological assessments, including complete blood count (CBC) and cell morphology.
- APL results from a genetic mutation that causes an abnormal fusion of two genes, PML and RARA, which disrupts the normal production of blood cells.
- This genetic alteration leads to a significant *decrease in white blood cells and platelets*, hindering the body's ability to combat infections and manage bleeding.
- **Average Diagnosis age in India -** 34 years.
- **Affecting Ratio -** Male-to-female ratio of 1.5:1.
- **Severity -** The condition poses a particular risk due to the potential for sudden internal bleeding in critical organs such as the lungs and brain, which ***can be life-threatening*** within days if not addressed promptly.
- **Prognosis -** With appropriate treatment, APL is considered one of the most curable subtypes of AML, with high remission and cure rates.
- **Treatment -** Often treated with a combination of chemotherapy and non-chemotherapy drugs like *all-trans-retinoic acid (ATRA) and arsenic trioxide (ATO).*

Reference

The Hindu | Acute Promyelocytic Leukemia (APL)

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