Bombay Blood Group

Source: IE

Why in News?

A woman with the rare **'Bombay' (hh) blood group** underwent a successful kidney transplant in **India**.

What is Bombay Blood Group?

- **About:** It was identified in Mumbai in **1952**, and also called the **hh blood group** due to the **absence of the H antigen.**
  - Antigens are **proteins or carbohydrates** on blood cells (**RBCs, WBCs** and **platelets**) that determine blood type. E.g., **AB blood group** has both **A and B antigens**, A has A antigens, B has B antigens, and O has none.
  - In the Bombay blood group, a **mutated or absent H antigen** gene prevents **A, B, or O antigen formation**.
- **Rarity:** It is **exceptionally rare** and found in approximately **1 in 10,000 Indians** and **1 in a million people globally.**
- **Problems in Blood Transfusion:** Individuals with **hh blood groups can't receive any A, B, AB or O blood**, including **O-negative**, as they contain the **H antigen**.
  - The recipient's immune system recognizes **donor antigens as foreign (antibodies)**, and triggers a severe **immune reaction.**
- **About Blood Group:** Under the **ABO blood group system**, blood groups are classified into four common blood groups i.e. **A, B, AB and O.**
  - It was first identified by Austrian immunologist **Karl Landsteiner in 1901.**
- **Cross-blood Transplants: Cross-blood transplants** (donors and recipients have **different blood types**) uses **double filtration plasmapheresis (DFPP)** process for blood transfusion.
  - In DFPP, the **antibodies** are **removed** from the **recipient's (patient's) blood**, using special filters for **safer transfusion** (suppress immune response).
  - If the recipient **antibodies** are not removed, they can cause **hemolysis (destruction of donor RBCs)** after transfusion.

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Blood Type Compatibility

Blood Type	Gives	Receives
A+	A+, AB+	A+, A-, O+, O-
O+	O+, A+, B+, AB+	O+, O-
B+	B+, AB+	B+, B-, O+, O-
AB+	AB+	Everyone
A-	A+, A-, AB+, AB-	A-, O-
O-	Everyone	O-
B-	B+, B-, AB+, AB-	B-, O-
AB-	AB+, AB-	AB-, A-, B-, O-

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. A married couple adopted a male child. A few years later, twin boys were born to them. The blood group of the couple is AB positive and O negative. The blood group of the three sons is A positive, B positive and O positive. The blood group of the adopted son is(2011)

(a) O positive

(b) A positive

(c) B positive

(d) Cannot be determined on the basis of the given data

Ans: (a)