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Q5(a)

Rh-Blood Group

UPSC Civil Services Mains 2016 · Anthropology GS 1 · 10 marks · Age, sex and population variation as genetic marker

9.6 Age, sex and population variation as genetic marker: ABO, Rh blood groups, HLA Hp, transferrin, Gm, blood enzymes. Physiological characteristics-Hb level, body fat, pulse rate, respiratory functions and sensory perceptions in different cultural and socio-economic groups.

Core demand of the question

- Write a note on Rh-Blood Group
- Keep the note to a 10-mark length of about 150 words

Revision summary

Rh groups centre on the D antigen.

Positive means D present; negative means D absent.

An Rh-negative mother can be sensitised by an Rh-positive fetus.

Anti-D prophylaxis prevents most haemolytic disease.

Frequencies differ by population, as a polymorphism.

Introduction

The Rh blood-group system is a set of red-cell antigens, of which D is the clinically decisive one. It matters in transfusion and in pregnancy.

Body**Genetics and types**

- **Landsteiner and Wiener** named Rhesus after the monkey work; later mapping showed a human **RH** locus on **chromosome 1**.
- **Rh positive** means D is present. **Rh negative** means D is absent. C, c, E, e add further types.
- **Inheritance is Mendelian. Population frequencies vary:** Rh-negatives are commoner in some European groups than in many Indian samples.

Medical anthropology

- An Rh-negative mother and Rh-positive fetus can cause **haemolytic disease of the newborn** after sensitisation.
- **Anti-D immunoglobulin** prevents most cases. Transfusion must still match D.
- It is a polymorphism, not a racial essence.

Flow diagram

Rh system -> Antigen Antigen D
Antigen D -> Rh positive
Antigen D -> Rh negative HDN risk

Conclusion

Rh is a red-cell system led by antigen D. Its anthropological use is population frequency; its medical use is transfusion and HDN prevention.

Facts & figures

Landsteiner and Wiener

1940 work that opened the Rh story, later refined genetically.

HDN

Haemolytic disease of the newborn from maternal anti-D.

Anti-D Ig

Postpartum and antenatal prophylaxis that cut HDN deaths.

Chromosome 1

RHD and RHCE genes of the system.

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