

7.5 Hypersensitivity

Name: _____ Class: _____ Date: _____ **Total: 23 marks**

KEY WORDS hypersensitivity

Objective

Classify hypersensitivity by clock and mechanism, and match treatment.

1 Key knowledge and worked examples

■ **The four clocks**

I IgE/mast cells/minutes; II IgG on cells/hours; III complexes/days; IV T cells/48–72 h ✓.

■ **Worked example: two patients**

Bee-sting collapse at 8 minutes → I, adrenaline IM. Nickel eczema at 72 h → IV, topical steroid ✓.

2 Practice

2.1 Which type is a tuberculin skin test? [3]

2.2 Which antibody class drives type I? [3]

2.3 Serum sickness is which type, and why days? [3]

3 Exam-style questions

3.1 A patient develops fever, rash and arthralgia 8 days after receiving a foreign serum (fictional).

Classify the reaction (III) and explain the days-scale (complexes form as antibody appears, then deposit). Predict the complement findings. State the treatment principle. [7]

3.2 A transfusion of A-positive blood to an O-positive recipient (fictional).

Explain the mechanism (pre-formed anti-A IgM → type II, immediate intravascular haemolysis). Predict the timeline and the urine/serum findings. Contrast with a delayed haemolytic reaction. [7]

Solutions

2.1

- Type IV.

2.2

- IgE ✓.

2.3

- Type III: antibody must first form, then complexes must deposit – an assembly lag of days ✓.

3.1

- Type III: antibody–antigen complexes deposit in vessels, joints and kidneys.
- Days: the immune response to the serum must mature first; then complexes form and deposit ✓. Complement consumed → low C3/C4.
- Stop exposure, supportive care ± steroids/antihistamines for symptoms.

3.2

- Pre-formed anti-A (naturally occurring IgM) binds the transfused cells → complement lysis: type II, minutes–hours.
- Immediate fever, loin pain, haemoglobinuria, low haptoglobin ✓.
- Delayed (days–weeks): anamnestic IgG to minor antigens – extravascular clearance, falling haemoglobin.