siblings have 25% of match

- Mostly occur in pre-sensitized/pre-exposed individual.

HYPERSENSITIVITY REACTION

⇒ A C I ▷ Delayed
↓ Anaphy ↓ immune complex
: Asthma cytotoxic

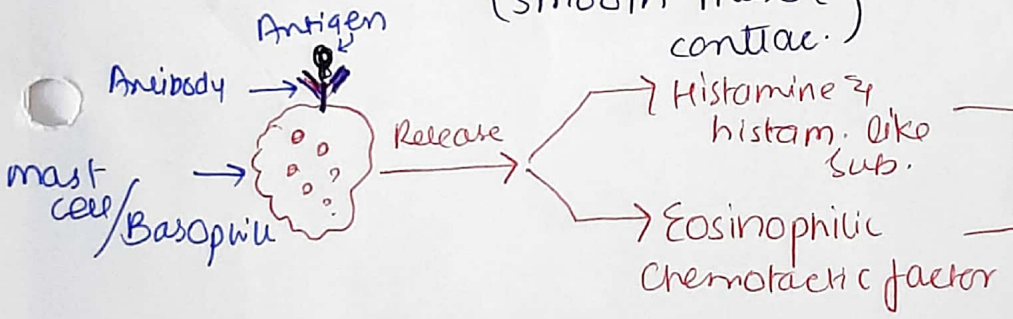
• Type-I:- Anaphylactic (sys. rex) and atopic (local reac.)

Immediate

- Occur in minutes
- Antigen crosslink ē IgE present on mast cell or basophils → degranulation
- Release of histamine
  - Bronchocons. (dilation) (smooth muscle contrac.)
  - Vasodilation.
- Tryptase is the marker of mast cell activ.

Late reaction.

- Occur in hours
- chemo & cytokines (TNF-α, IL-6, IL-4) are secreted from mast cells
  - Tissue damage
  - Inflamm.



Causes: Asthma, peanut allergy, bee sting, allergic conjuctiv. or seas. aller

Tests: • Skin Test or Blood Test (ELISA) ⇒ for allergen sp IgE

• Radioallergosorbent (RAST) & radioimmunosorb (RIST) (radio labell)
radiolabelled

THERAPIES:-

① Desensitization/Hyposen: I/M weekly = small dose of allergen → ↑ IgG (↑ Tsc)
Then monthly

② H_1-antagonist (doesn't give 100% resp, bcoz histami is not only involve)

③ Epinephrine: (albuterol = bronchodil, phenylpropanolamine = Nasal congest (vasoconstrictor as well)

④ cromolyn: (inhib. mast cell)

⑤ Topical steroids (comb ē β-ago for asthma)

⑥ Anti-IgE.

★ Type II Hyper. S.R:- cell surface Ag-Ab binding leads to cellular destruction, inflamm. & cell dysfun.

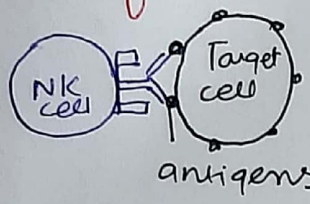
Cellular Dysfunction (destruction)

- Opsonization of cell by antibodies leading to
  - i Phagocytosis
  - ii NK-cell killing (ADCC
  - iii Activation of complement system

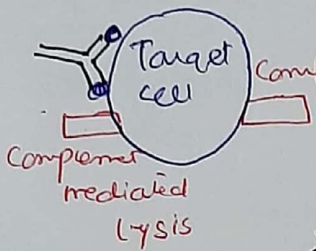
Examples

- autoimm. hemolytic anemia
- idiopathic imm. thrombocytopen
- Transfusion rex

Hemolytic disease of new-born (fetal erythroblastosis).



antigens



Inflammation

- Activation of complem. sys
  - neutrophil infiltration
  - inflam

Examples

- Goodpasture syndrom (lung & kidney affect autoim)
- Rheumatic fever (progress from untreated strep throat)

cellular dysfun

antibody binding to cell → cell. dysfun

Examples

- Myasthenia gravis (against Achrecep) muscle weakness
- Graves dis (Hyper thyroidism)
- pemphi vulgais (skin disease)

Hyper-acute Transplan rejec (mostly due to Transfu rex).

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1. CYTOTOXICITY may be from → complement activ] either one or from both
2. → phagocytosis of IgG opsi cell

antibody dep. cell-medi cytotoxi → Direct killing of antibody coated cell by NK, macro, or eosinoph.

ONSET:- First expos = inflam in 7–10 days.
second exp = " = ≤3 days.

Prophylaxis:-

① withdrawal of drug (if causative agent) & avoid re-contact
② anti-RhD is adm during & ein 72 hr post-partum after each pg.

Opsonization: immune process which uses opsonins to tag foreign pathogens for elimin. by phagocytosis

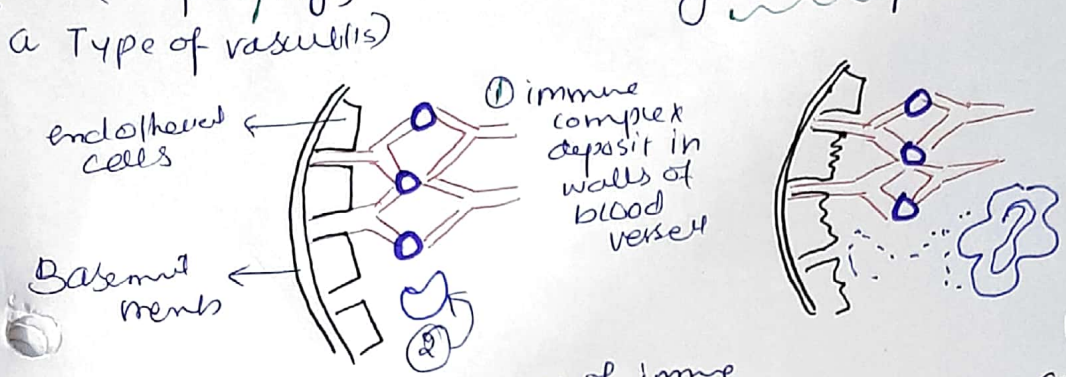
NK-cells: kill by secreting perforin (pore forming cytotoxic protein) and granzyme (enter by pores & activate intracellular enzyme (caspases) that play pivotal role in Apoptosis.

Type-III H.S.R — imme complex

- antigen-antibody-complement ↓
- can be assoc. ē vasculitis & systemic manifes.
- Mostly IgG activate complem → attrac neutrop

EXAMPLES

Polyarteritis Nodosa (Hep B Ag) [a Type of vasculitis] — SLE — Post-streptococcal glomerulonephritis — Rheumatoid arthritis



presence of imme complex → complement activ → attract inflamm cell such as Neutrop

③ Enzy release from neutrophils cause damag to endothe cells of basement membs.

Symp:- Fever ↔ Urticaria ↔ Arthalgia

Also Proteinuria & Lymphadenopathy occur 1-2 weeks after

UAE

"You go to UAE & feel tired and due to weather change you get fever = and take medication which cause urticaria"

Reaction

Serum Sickness Rx

- Complement activ → inflamm → Tissue damage
- assoc ē some drugs
  1) (hapten: penicillin)
  2) Infection (Hep B)
  3) anti-venom (e.g for snake venom)
- 1-2 week after exp or Ag-Ab complex formation
- Fever, itching, Rash, joint pain & often Lymph nodes

Arthus Rx

cutaneous vasculitis: induration = hardening of soft tissues; swelling & edema/necrosis/hemorrhage

- local sub-acute immu. complex med. H.S.R
- Appear 4-10hr after injection
- Intradermal inj of pre-sensit (having IgG) → Immune complex

Examples: Vaccines & Insulin (Tetanus, Diphtheria, Hep B)

- Farmer's lungs: inhal of Fungi/bac → Ty-III
- humidifier lungs (Hypers pneumonitis): spores bone in aerosol microdrop from ultrasonic humidifier

ONSET
- Systemic
  - Pre-exposure 1st = 1-2 weeks
  - pre-existing antibodies = 1 day
- local — 6-8hr

- Avoid caustic agent - Corticosteroid - antihistamine

Humidifier: Add moisture to enviro. to prevent dryness of body skin. They can even ease sym of flu / common cold

Creams, ointment

(Delayed)

Type-IV H.S.R

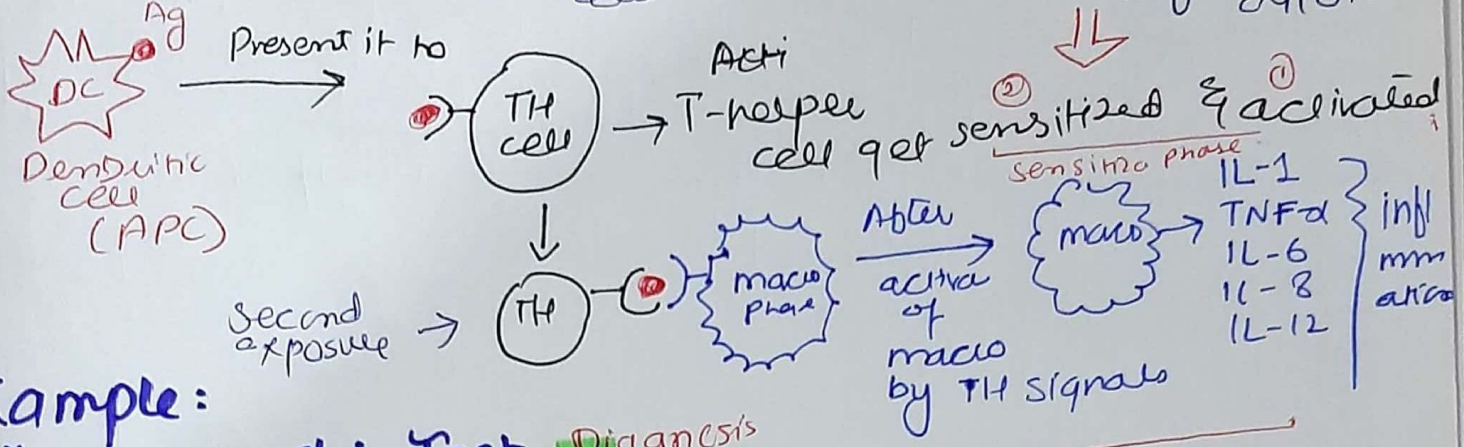
- doesn't involve antibodies
- involves T-cells — 2 mechanisms (also T-II)

↓ Direct cell cytotoxi

↓ CD8+ CT → kill virus targeted cells (T-killer)

↓ Inflamm. rex.

↓ (helper) CD4+ T-cell recog. antigen & release inflam cytokie



Granuloma formed
- local aggreg of TH1 cells, macrophage & giant epithelioid cells: derive from fusion of macrophages

Example:

1. **Tuberculin-Skin-Test** → Diagnosis
   - ① intra-dermal inj ē antigenic extract of M.TB
   - ② If the pt is already exposed or sensi in his life then induration (thickening of skin) & erythema peaks in 1–2 days due to inflam.
     (hardening of soft skin)

Effector phase.

2. **Contact Dermatitis** :- poison ivy, nickel allergy (a.k.a eastern poison [Asian & east North American flowering plant])
   - usually CD8+ cell involved.
   - Test: patch test
   - ⑤ Also occur in Diabetes Mellitus
3. **Graft v/s host**
4. **candida extract** (T-cell show response)

Other antigens include: M.TB, M.leprae, Listeria monocy.

ONSET: • Granuloma form ē min of 2 weeks
• Contact sensitiv occur in 12–24hr in Pre-sensitized person → Peak: 48–72hr.

Therapy: • removal of avoidance of allergen
• Proper treatment of causative agent
• Corticosteroids (Topical)
• Cortisol (oral) in case of severi