

Drug allergy

It is an immunologically mediated reaction producing stereotype symptoms which are unrelated to the pharmacodynamic profile of the drug, generally occur even with much smaller doses and have a different time course of onset and duration. This is also called drug hypersensitivity; but does not refer to increased response which is called supersensitivity

Mechanism and types of allergic reactions

A. Humoral

Type-I (anaphylactic) reactions Reaginic antibodies (IgE) are produced which get fixed to the mast cells. On exposure to the drug, AG: AB reaction takes place on the mast cell surface releasing mediators like histamine, 5-HT, leukotrienes especially LT-C₄ and D₄, prostaglandins, PAF, etc. resulting in urticaria, itching, angioedema, bronchospasm, rhinitis or anaphylactic shock. The manifestations occur quickly after challenge and are called *immediate hypersensitivity*. Antihistaminic drugs are beneficial in some of these reactions.

Type-II (cytolytic) reactions Drug + component of a specific tissue cell act as AG. The resulting antibodies (IgG, IgM) bind to the target cells; on reexposure AG: AB reaction takes place on the surface of these cells, complement is activated and cytolysis occurs, e.g. thrombocytopenia, agranulocytosis, aplastic anaemia, haemolysis, organ damage (liver, kidney, muscle), systemic lupus erythematosus.

Type-III (retarded, Arthus) reactions These are mediated by circulating antibodies (predominantly IgG, mopping AB). AG: AB complexes bind complement and precipitate on vascular endothelium giving rise to a destructive inflammatory response. Manifestations are rashes, serum sickness (fever, arthralgia, lymphadenopathy), polyarteritis nodosa, Stevens-Johnson syndrome (erythema multiforme, arthritis, nephritis, myocarditis, mental symptoms). The reaction usually subsides in 1–2 weeks.

B. Cell mediated

Type-IV (delayed hypersensitivity) reactions These are mediated through production of sensitized AG. On contact with the AG these T cells produce *lymphokines* which attract granulocytes and generate an inflammatory response, e.g. contact dermatitis, some rashes, fever, photosensitization. The reaction generally takes > 12 hours to develop.

Drugs frequently causing allergic reactions

Penicillins Salicylates Cephalosporins Carbamazepine Sulfonamides Allopurinol, Tetracyclines
ACE inhibitors
Quinolones Methyl dopa, Antitubercular drugs Hydralazine, Phenothiazines Local anaesthetics