**Lab 8 Immune complexes diseases**

**Serology and Vaccines**

A disease caused by the deposition of antigen-antibody or antigen-antibody-complement complexes on the surface of cells, resulting in the development of chronic or acute inflammation, which may be manifested by vasculitis, endocarditis, neuritis, or glomerulonephritis.

Under normal conditions immune complexes are rapidly removed from the bloodstream by macrophages in the spleen and Kupffer cells in the liver. In some circumstances, however, immune complexes continue to circulate. Eventually they become trapped in the tissues of the kidneys, lung, skin, joints, or blood vessels. Just where they end up probably depends on the nature of the antigen, the class of antibody-IgG, for instance, instead of IgM-and the size of the complex. There they set off reactions that lead to inflammation and tissue damage.

1. **SERUM SICKNESS**: The immune system reacts to medications that contain proteins used to treat immune conditions. Or it can react to antiserum, the liquid part of blood that contains antibodies given to a person to help protect them against germs or poisonous substances. Antiserum is produced from the plasma of a person or animal that has immunity against an infection or poisonous substance. Antiserum may be used to protect a person who has been exposed to a germ he or she has not been vaccinated against. For example, you may receive a certain type of antiserum injection if you have been exposed to tetanus or rabies. This is called passive immunization. It gives you immediate, but temporary, protection while your body develops an active immune response against the toxin or germ. During serum sickness, the immune system falsely identifies a protein in antiserum as a potentially harmful substance (antigen). The result is an immune system response that attacks the antiserum. Immune system elements and the antiserum combine to form immune complexes, which cause the inflammation and other symptoms of serum sickness.

Certain medications (such as penicillin, cefaclor, and sulfa) can cause a similar reaction very soon after receiving the medication ,while serum sickness develops 7 to 21 days after the first exposure to a medication.

Symptoms of serum sickness can include: Fever, General ill feeling , Itching ,Joint pain ,Rash ,and Swollen lymph nodes. Symptoms usually do not develop until 7 to 21 days after the first dose of antiserum or exposure to the medication. However, some people may develop symptoms in 1 to 3 days if they have already been exposed to the substance.

1. **ARTHUS REACTION**: Maurice Arthus found that injection of soluble Ag intradermally into hyperimmunized rabbits with high level of circulating Ab produce an erythematous and oedematous reaction reaching apeak at (3 - 8) hours and then usually resolving . Arthus manifests as local vasculitis due to deposition of IgG-based immune complexes in dermal blood vessels. Activation of complement primarily results in cleavage of soluble complement proteins forming C5a and C3a, which activate an intense infiltration with polymorphnuclear leucocytes , anaphylatoxin is soon generated and causes must cell degranulation , platelets aggregation and vasoactive amine release ,and as a result , erythema and odema increase

**Arthus reaction and skin delayed hypersensitivity:**

* Previously immunized mice were challenged by injecting the left hind foot pad with 50 µl of 10% washed SRBC (sheep RBC washed with saline) S.C.
* Foot pad swelling was measured as the increase in foot pad thickness (left minus right) after challenge using micrometer (Vernie).
* Arthus reaction was observed and determined as an increase in foot pad swelling 4 hours following elicitation, D.T.H( Delayed type hypersensitivity)reaction peak at 18 to 24 and persists for 48 hours after challenge with SRBCs.