

Role of Immunoglobulin in Pregnancy

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DESCRIPTION

Immunoglobulin is also known as Antibodies. Immunoglobulins are Y-shaped globular proteins that are about 10 nm in size and 150 kDa in molecular weight. All immunoglobulin's consists four common polypeptides subunits; they are two identical heavy chains and two identical light chains. The polypeptide chains are held together with a disulfide bridge which forms a Y-shaped structure. All antibodies show dual functionality such as binding to viruses or bacteria and mediating biological immune responses. The main function of Immunoglobulins is to produce humeral immunity by binding to the antigen. The body fluids that may contain immunoglobulin are saliva, tears, gastric secretions and mucosal secretion.

Immunoglobulin's protect the body's immune system by regulating the multiple cell destruction pathways, depending on the type of signals or pathogens they interacted. Immunoglobulin's are usually present either on the surface of B-cells or circulating freely in the body fluids. The binding of the antibody to its specific antigen results in the formation of an antibody-antigen complex which produces an immune response. They are three different types of mechanisms such as Neutralization, Opsonization and complement activation.

Generally Immunoglobulin's are classified into five types, they are,

- IgG-It is the most common antibody present in the body. It has the longest lifespan of about 23 days. The main function of IgG is to enhance the phagocytosis of pathogens, neutralize bacterial or viral toxins, and trigger the activation of the complement system. These are subdivided into four types such as IgG1, IgG2, IgG3 and IgG4
- IgM-It is the first antibody that cooperates with new bacteria that enters the body, and it indicates a primary immune response. The lifespan of IgM is five days. It causes agglutination of bacteria when binding to its surface epitope
- IgA-It is the most common antibody which present in the blood, lymph and other body secretions such as milk, tears, saliva etc.

- IgD-It makes up less than 0.5% of serum antibodies. It is lesser found in the lymphatic fluids and blood
- IgE-It makes up less than 0.01% of serum antibodies. It is most effective antibody against parasitic infections

During pregnancy, major adaptations occur in the maternal immune system to protect the mother and her future baby from pathogens although avoiding harmful immune responses against the allogeneic fetus. Plasma levels of C3a, C4a, C5a, C4d, C3a, C3, C9, and the Serum Complement Membrane Attack Complex SC5b9 are raised during pregnancy. Pregnancy is a hyper-Coagulable state, with a four-fold improved risk for deep vein thrombosis when associated to non-pregnant women.

The current evidence suggests that IVIG use during pregnancy can be recommended such as in utero diagnosis of neonatal allo-immune thrombocytopenia, gestational allo-immune liver disease, hemolytic disease of the fetus and newborn for early-onset severe intrauterine disease, Anti-Phospholipid Syndrome (APS). IVIG therapy controls the immune system in several mechanisms, in a way that might enhance the survival rate of the embryo in the uterus and might reduce the odds of a miscarriage.

CONCLUSION

Gamma globulin replacement therapy and the use of gamma globulin for autoimmune disease have been safe in pregnancy. The essential for maternal IgG to provide an immunoglobulin infusion to the fetus during the third trimester requires that the dose remain sufficient to maintain an adequate plasma IgG level in the mother during the pregnancy. The prevention of infection may also require a change in dose during pregnancy since the increase of volume of distribution will require an increase in gamma globulin dose to maintain the same blood level. The plasma volume increases in pregnancy approximately 30%-50%, with a peak at approximately 32-34 weeks of gestation.

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