12.1A: Passive Immunization

LEARNING OBJECTIVES

- Describe how artificial and natural passive immunity function to provide antibody protection against microorganisms

There are two types of passive immunity: artificial and natural. Artificial passive immunity is achieved by infusion of serum or plasma containing high concentrations of antibody. This form of passive immunity provides immediate antibody protection against microorganisms such as hepatitis A by administering preformed antibodies. These antibodies have been produced by another person or animal that has been actively immunized, but the ultimate recipient has not produced them. The recipient will only temporarily benefit from passive immunity for as long as the antibodies persist in their circulation. This type of immunity is short acting, and is typically seen in cases where a patient needs immediate protection from a foreign body and cannot form antibodies quickly enough independently.

Figure: Immunity: Natural immunity occurs through contact with a disease causing agent, when the contact was not deliberate, where as artificial immunity develops only through deliberate actions of exposure. Both natural and artificial immunity can be further subdivided, depending on the amount of time the protection lasts. Passive immunity is short lived, and usually lasts only a few months, whereas protection via active immunity lasts much longer, and is sometimes life-long.

Passive immunity can also be acquired naturally by the fetus due to the transfer of antibodies by the maternal circulation in utero through the placenta around the third month of gestation. Immunity in newborn babies is only temporary and...
starts to decrease after the first few weeks, or months. Breast milk also contains antibodies, which means that babies who are breastfed have passive immunity for longer periods of time. The thick, yellowish milk (colostrum) that is produced during the first few days after birth is particularly rich in antibodies. For the newborn to have lasting protection, active immunity must be received. The first immunisation, given when a baby is two months old, includes whooping cough and Hib (haemophilus influenza type b) because immunity to these diseases decreases the fastest. Passive immunity to measles, mumps and rubella (MMR) usually lasts for about a year, which is why the MMR is given just after the baby's first birthday.

**Key Points**

- Passive immunization provides humoral immunity.
- Artificial passive immunization is the injection of preformed antibody solution when a patient is incapable of producing antibodies fast enough to combat a disease.
- Natural passive immunization is the transfer of antibodies through the placenta of a pregnant woman to the fetus. Immunity lasts for a couple of months after the baby is born, after which active immunization is required.

**Key Terms**

- **in utero**: Occurring or residing within the uterus or womb; unborn.