Your Foal's First Challenge: Passive Transfer of Immunity

Overview: When a foal is born, they have very little circulating antibodies in their blood. Immunity from diseases is obtained from antibodies which are transferred from the mare to the foal through the mare's milk. The milk that is rich in antibodies and other nutrients is called colostrum. Colostrum is a thick, yellow liquid which is secreted from the mammary gland only around the time of parturition. A foal is able to absorb the maternally derived antibodies, immunoglobulins, including IgG (primarily and most importantly) and IgM and IgA (in lesser amounts) from colostrum within the first 12 hours of life before "gut closure". The concentration of IgG within the milk decreases rapidly after lactation begins and there is none left 24 hours post-foaling. If a foal does not receive these antibodies, called failure of passive transfer, they are very susceptible to infections. Failure of passive transfer (FPT) is the number one cause of mortality in foals during the first week of life.

Causes of FPT: There are maternal and foal causes for FPT. The maternal causes include premature lactation, poor colostral quality (colostrum low in antibody count), failure of lactation, death of the mare during parturition, and excessive maternal aggression towards the foal. Poor colostral quality may occur in maiden mares (first pregnancy) or may result from inadequate vaccination of the mare prior to parturition. In addition, foal causes for FPT include the failure to ingest colostrum or failure to absorb colostrum (premature foal). If a foal does not nurse adequately during the first 24 hours of life, then the degree of passive transfer must be evaluated. The average 40 kg (88 lb) foal requires 2-3 liters of mare's colostrum.

Common Sequela to FPT: Diseases such as septicemia, including septic joints or "joint ill", meningitis, eye infections, enterocolitis, umbilical infections, pneumonia and death can result from FPT.

Diagnosis: A few diagnostics tests can be performed by your veterinarian to assess passive transfer of immunity. The most common test which can be performed on the farm is called an ELISA test, also known as the Foal Snap Test. Adequate passive transfer is considered greater than 800 mg/dl of IgG concentration. A range of 400-800 mg/dl is partial failure of passive transfer, and less than 400 mg/dl is considered complete failure of passive transfer.

Treatment: If the foal is less than 12 hours old, colostrum (up to 2-3 liters) obtained from the mare or from banked colostrum can be administered to the foal orally or via a nasogastric tube. Plasma (whole blood without red blood cells which contains antibodies) can also be administered intravenously (preferred) or orally by your veterinarian. If the foal is greater than 24 hours old, then intravenous plasma is necessary. IgG levels should be re-evaluated in 12-24 hours after transfusion to see if additional transfusions are necessary.

Prevention: First, the pregnant mare should be vaccinated 4-6 weeks prior to parturition. This results in protective levels of antibody in the foal for 4-6 months after adequate passive transfer. Making sure a foal stands and nurse's adequately is important. A normal foal should start nursing 2 hours postpartum and nurse 4-6 times per hour. Having your veterinarian perform a foal examination and ELISA snap test within 12 hours after birth is a good way to prevent FPT. If the level of IgG is inadequate, then the sooner the foal receives treatment, the better chance your foal will have a healthy start to life. Even if your foal appears healthy, we recommend a foal exam and IgG level by 24 hours of age. Prevention is the best treatment!

If you have any questions regarding failure of passive transfer, please contact your regular veterinarian or the veterinarians at New England Equine Medical & Surgical Center.

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