Use Of Galliuim Maltolate To Treat Foal Pneumonia

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Background: Pneumonia caused by the bacterium Rhodococcus equi is a major cause of disease and death in foals at breeding farms. The disease is prevalent even at farms that use best practices for controlling infectious diseases (attended foalings, checking foals for adequate transfer of antibodies from the dam via colostrum, etc.) It is not a disease of neglect or poor hygiene, and is a problem at the very best managed and maintained farms.

Because a vaccine is not available to control this disease, many farms have implemented screening testing of foals in an effort to identify foals with R. equi as early as possible. The rationale for screening foals for R. equi pneumonia is that earlier intervention will lead to fewer deaths from this form of pneumonia and possibly a shorter duration of treatment in foals. A problem with this approach is that more foals are treated with the standard antibiotic regiment (a macrolide antibiotic such as azithromycin in combination with the antibiotic rifampin).

The more widespread use of these antibiotics has led to another problem:resistance of R. equi to the standard antibiotics. Resistance to macrolides is class-specific, meaning that if a bacterium is resistant to 1 macrolide it is resistant to all. Currently, there are no practical alternatives to standard antibiotic treatment for controlling R. equi pneumonia. The lack of effective alternatives to standard treatment and the specter of increasing resistance to standard antibiotics led us to pursue a clinical trial to determine if a novel antimicrobial compound known as gallium maltolate could be considered similar (non-inferior) to standard antimicrobial treatment. Gallium maltolate is a metal-based drug that has been documented to be effective at killing R. equi even when the bacteria are inside cells, and to be safe for treating foals.

Methods of the Study: Foals at several breeding farms in central Kentucky (Lexington area) were screened using ultrasound of the chest to find foals with abscesses in their lungs considered to be caused by R. equi. Foals with these abscesses were randomly assigned to receive either standard treatment (clarithromycin + rifampin) or gallium maltolate. In the 54 foals included in the project, the investigators observed similar frequency of successful outcome with standard treatment and gallium, and statistical evidence that the gallium maltolate was not inferior to standard treatment.

Importance: **Because gallium maltolate is not inferior to standard treatment, it can be used as an alternative to standard treatment. This is important because using gallium maltolate could help to limit or reduce the occurrence of resistant bacteria. The issue of antibiotic resistance is a problem of urgent importance for equine and human health.** Identifying clinical effectiveness of novel classes of drugs (such as metal-based ones) is of clear importance for veterinary and human medicine.