

Equine Melioidosis: The Results of a Challenge Experiment

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Short Communication

Received: 05-May-2023,

Manuscript No. JVS-23-97873;

Editor assigned: 08-May-2023, Pre
QC No. JVS-23-97873 (PQ);

Reviewed: 22-May-2023, QC No.

JVS-23-97873; **Revised:** 29-May-
2023, Manuscript No. JVS-23-

97873 (R); **Published:** 06-Jun-2023,
DOI: 10.4172/2581-3897.7.2.002

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Citation: Wernery U, et al. Equine
Melioidosis: The Results of a
Challenge Experiment. J Vet Sci.
2023;7:002.

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ABOUT THE STUDY

Melioidosis is an infectious disease in humans and animals caused by the Gram-negative motile bacillus *Burkholderia (B.) pseudomallei*. It sometimes resembles glanders in horses. *B. pseudomallei* shares 99 % genetic homology with *B. mallei*, the etiological agent of glanders [1]. *B. mallei* has evolved from *B. pseudomallei* by reduction of genetic information and is phylogenetically considered a clone, a pathovar of *B. pseudomallei* [2]. This is the reason why both diseases, glanders and melioidosis, are in one chapter of the Terrestrial Manual of WOA [3]. Melioidosis is considered an emerging disease and is present in many regions worldwide [4]. In horses, it presents itself as per acute, acute and chronic forms and may closely resemble glanders. Clinical signs of acute melioidosis have been reported with high fever, septicemia, lymph edema, colic, diarrhea and death in 24 hours, whereas chronic cases show a course of 3 weeks to 8 months during which emaciation, edema, and lymphangitis of the limbs, pneumonia, and cough with nasal discharges are observed. It is reported that the lungs are always affected and show signs of acute bronchopneumonia with numerous abscesses of different sizes undistinguishable from glanders pyogranulomatous nodules of various sizes. No approved antibiotic regimens have been recommended. In humans, the disease is frequently fatal despite timely therapy.

Six horses were experimentally (3 orally and 3 subcutaneously) infected with *B. pseudomallei* as well as 2 male guinea pigs intraperitoneally [5]. Additionally CFT and antibody ELISA were used according to the OIE Manual. Horses

infected orally and subcutaneously with the pathogen displayed severe lesions in the lungs and urinary bladder (Figures 1-3a and 3b).

Figure 1. Subpleural lung abscesses of different size.

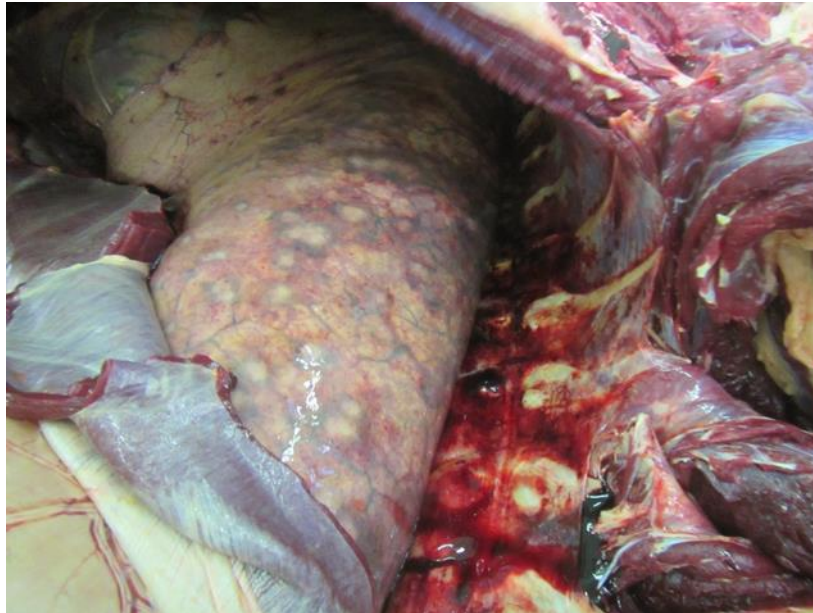


Figure 2. Lung cut surface showing whitish necrotic granulomas.

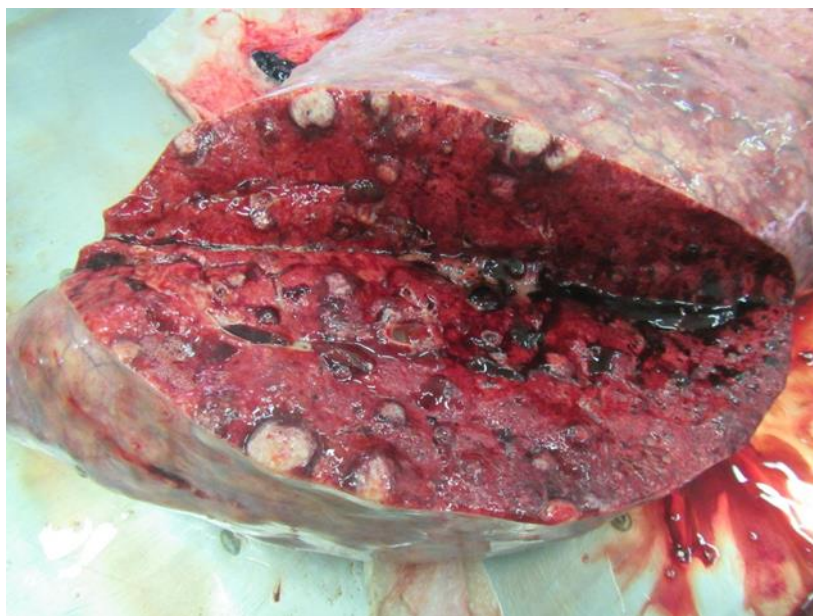
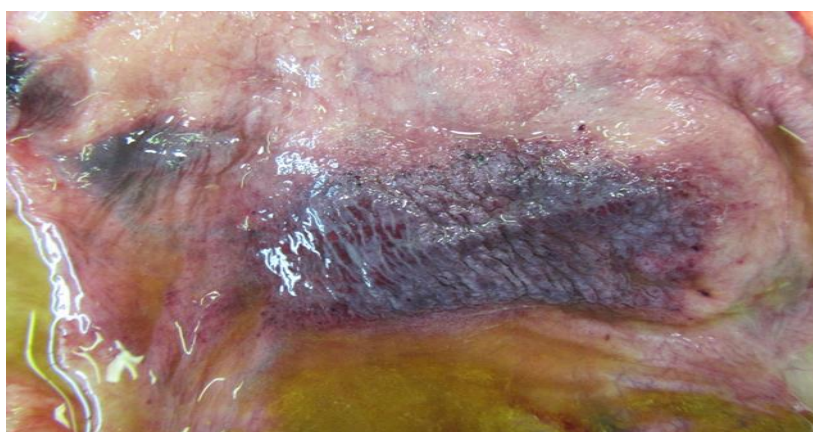


Figure 3a. Thickened edematous urinary bladder wall with massive ecchymosis.



Figure 3b. Edematous urinary bladder wall with mucosal hemorrhages.



Both male guinea pigs displayed multifocal whitish granulomas 2 mm in diameter in liver, spleen and testicles from which the pathogen was re-isolated. *B. pseudomallei* was also re-isolated from lung, urinary bladder, urine and surface floor of the stables where the infected horses were housed. The experimental infection of 6 horses with *B. pseudomallei* showed several differences between glanders and melioidosis. The infected horses produced severe lesions in the urinary bladder wall associated with edema and ecchymosis. It is therefore of importance to collect urine when dealing with melioidosis. Another important difference between these 2 notifiable diseases is that none of the infected horses displayed lesions in the nasal septum nor conchae and therefore nasal discharge is rarely observed. If nasal discharge is observed, it originates from severe lesions of the lung and not from the head. Typical pyogranulomas were, however detected in the lungs and other organs indistinguishable from glanders alterations. The infection experiment also confirmed that serological diagnosis of melioidosis is difficult and that glanders and melioidosis cannot be differentiated based on current diagnostic tests for glanders laid down in the Office International des Epizooties (OIE) Manual [5]. Control of melioidosis should include the elimination of all equine reactors, stable hygiene with special emphasis on the usage of disinfectant, removal of feces several times a day,

and reduction of water usage for cleaning. This procedure proved its success in the enzootics in France some time ago when the infected soils were cleared only after all infected animals were removed.

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