

Glander: A Summary of Diagnosis and Control

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Abstract

Background: Glander or Farcy, is acute or chronic highly fatal, notifiable, zoonotic and infectious disease characterized by fibrocaceous ulcerative nodules in lung, skin and upper respiratory tract. Centers for Disease control and prevention (CDC) consider it a bioterrorist threat. It is a worldwide distribution, and it is endemic in some parts of Middle East, Africa, Asia and South America. It mainly infect equine.

Aims/Objectives: To review and describe the current definition, diagnosis and control of glander in a summary form.

Methods: Research studies of several articles.

Results/Discussion: Glander is a highly contagious and often fatal zoonotic disease, it is a bioterrorist threat and this requires the development of new glanders countermeasures, as there is a lack of an effective vaccine and multiple antibiotics needed to eradicate *B. mallei*.

Conclusion: Early detection is the most important method of prevention and control of glander. It depends on early detection, human isolation and eradication of test positive animals in conjunction with strict animal movement control and quarantine by cleaning and disinfection outbreak areas.

Keywords: Glander; symptoms; Method of Eradication and Controlling

Background

Glander is caused by *Burkholderia mallei* (*Pseudomonas mallei*) closely related to *Burkholderia pseudomallei* which cause melioidosis, it is gram-negative rod with rounded end, non-motile, non-spore forming bacteria, cultured on ordinary agar (blood or serum agar) or broth media contains glycerol. When the microorganisms enter body of the host, it multiplies in the point of entry, reaches regional lymph nodes. It reaches the blood through lymphatic vessels and causes septicaemia in the acute cases and bacteraemia in the chronic cases then it reaches the lung and other viscera and causes bronchopneumonia and nodules in different organs. Glander is endemic but now eradicated from most countries. Horses, mules and donkeys are mainly susceptible host, but it has been reported in dogs, cats, goats, sheep and camels, it is an occupational disease in human as veterinarian. There are highly resistant animals to this disease as pigs and Cattle. Overcrowding, badly fed animals and animals kept in poor environment are factors influencing susceptibility. Glander is transmitted by ingestion of contaminated food or drinking contaminated water with *Burkholderia mallei* (*B. mallei*). contact between healthy and infected animals is considered the main route of infection. Contaminated meat is the source of infection in Carnivores. The incubation period is two to six weeks. Morbidity and mortality rate are high, course of the disease from few days up to two weeks in acute form while in chronic form is long extending for months.

Acute form is common in donkeys and mules, there are sticky, yellow nasal discharge or may be bloody, cough, fever, laboured respiration, ulcers and nodules may present in nasal passage, mucous membrane of the upper respiratory tract, lung and skin. lymph nodes are enlarged and painful. Septicaemia may lead to death. Chronic form is common in horses. Signs differ according to the predilection site:

1) Pulmonary form: there is dyspnea to severe respiratory distress in mild cases. In severe cases, there are nodules and abscesses in the lungs, chest pain, pleural effusion, other signs as debilitation, Diarrhea, polyuria muscles tightness and orchitis in males. 2) Nasal form: Nodules and ulcers in nasal mucosa, pharynx, larynx and trachea; this nodules appear firm, round, with calcified center. Yellowish, greenish or bloody thick purulent discharge. nostrils usually appear swollen. Lymph nodes are enlarged, cold, painless. 3) Skin form (Farcy): nodules, abscesses contain oily purulent yellow exudate in the skin connected with the surrounding lymphatics by thickened lymphatics felt as rosary shape like. Lymph nodes are enlarged, there are skin rashes with pustules, excessive sweating and painful edema in the legs [1-5].

Case Study

Diagnosis

Field diagnosis is the diagnosis of Glander depending on history, clinical signs and a hypersensitivity reaction to *Burkholderia mallei* (*B. mallei*) called mallein test. it is used to identify infected equids, by injection a protein fraction of *Burkholderia mallei* (*B. mallei*) by three methods; intrapalpebral which gives swelling of the eyelid as a positive result, subcutaneous which gives firm painful swelling within 24 hours or by eye drop administration which gives conjunctivitis as a positive result. Physical examination as listening to the heart and lung, inspection examination of sores and skin lesions, palpation of the lymph nodes, limbs and muscles. Laboratory diagnosis Samples are nasal discharge, nodular content from closed nodule, blood or paired serum samples. 1) Microscopic examination of smear stained by methylene blue, Wright, Gram or Giemsa stain, show non motile, Gram negative and rod shape microorganisms. 2) Culture on ordinary media as blood agar or glycerol agar; recent colony appears smooth, moist and slightly creamy colour while old colony appears thick, tough and dark. 3) Serological tests: complement fixation and ELISA are accurate tests. Agglutination and precipitin tests are less accurate with chronic cases. 4) Animal inoculation (Strauss reaction): I/P injection of pus in male Guinea pig, if signs appear as peritonitis and orchitis this means positive Strauss reaction.

Treatment

It can be applied only in the endemic areas. Using different types of the antibiotics as this bacteria may be resistant to a particular type of antibiotics as sulfadiazine, tetracycline, streptomycin, gentamycin and novobiocin. Cleaning the sores and skin lesions with antiseptic solution. Treatment is risky as the disease is zoonotic.

Control

If suspected case:

- Isolate the animal in quarantine.
- Applied safety precautions when you contact with it.

If confirmed case:

- Euthanize the animal in outbreak areas.
- Cleaning and disinfection the equipment and stable.
- Burning or burying the contaminated materials, bedding, food and Carcasses.
- Quarantine newly purchased animals for at least 28 day.
- Quarantine the infected animal in the endemic areas for 6 months.

Conclusion

Regular monitoring and controlling the infected cases and effective quarantine measurements are the most important steps to prevent infection with Glander disease.

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