

MVSc. Programme- VMC-602 -
lecture 6

Bacilli-2

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ANTHRAX



Anthrax is most commonly observed as peracute and acute form

Ch / by sudden death without apparent clinical signs and symptoms

Sign and symptoms:

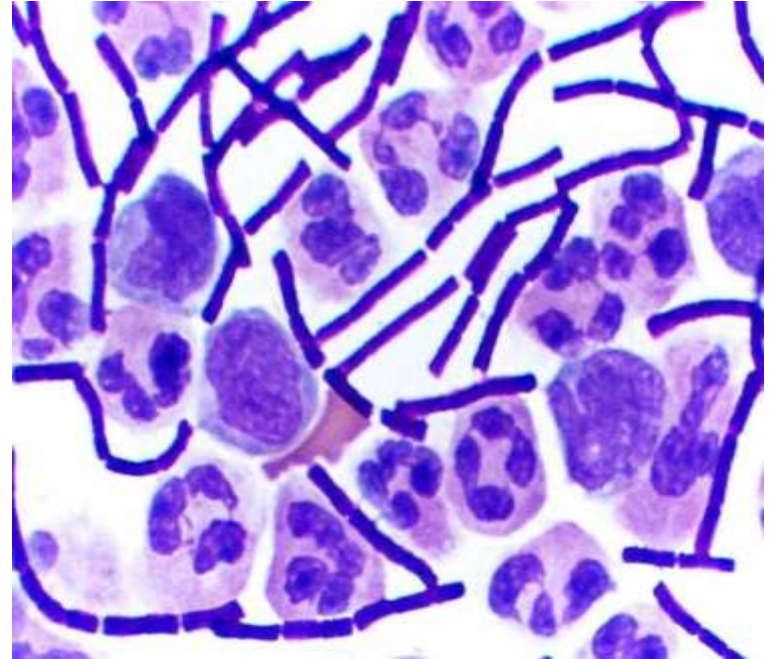
- The course of disease is rapid in susceptible species whereas more protracted course is observed in animals exhibiting lower susceptibility.
- The blood may come in urine and oozing of tarry coloured fluid from rectum and other natural orifices is generally observed from carcass.
- Acute cases ch/by fever, muscle tremor and difficulty in breathing
- Animal may die within 2-3 days
- *Splenomegaly* is a common finding, in case PM examination is performed

Sign and symptoms:

- Sub acute forms is characterised by fever, depression, inappetence, prostration and death.
- In some animals, swelling in throat region is observed.
- Horses may exhibit signs of digestive upset and colic.
- Pig population exhibit greater resistance to anthrax bacilli
- Symptoms mainly observed are swelling of the throat and pharyngeal and cervical lymph glands.
- Intestinal form of the disease in pigs is ch/by with anorexia, vomiting, diarrhoea (*sometimes bloody*) or constipation.

Diagnosis:

- Per acute death with oozing of tarry coloured blood from nature orifices (mouth, nostril, anus etc.)
- Carcass do not exhibit signs of rigor mortis and putrefy rapidly.
- Polychrome methylene blue staining- smear prepared from peripheral blood –
 - *blue square ended long chains of bacilli, surrounded by pink capsule*
- This unique staining characteristic - “*Macfaden reaction*”



Diagnosis:

Ascolis test:

- Performed on samples like hide.
- The homogenised material is boiled and filtered to be used as antigen in this reaction.
- The filtrate is layer over specific antisera kept in a narrow tube.
- In positive case, white precipitin line appears between the antigen and antisera.
- PCR methods have been developed to detect cases of anthrax.

Treatment and Control:

- Penicillin in large doses can be used to treat the affected animals.
- PM examination is prohibited on suspected carcass
(*as exposure to oxygen promotes sporulation*)
- Deep and safe burial of carcass should be ensures.
- In endemic areas, routine and mass vaccination of susceptible population should be followed.
- ***Sterne strain live spore vaccine*** is recommended
(*non-capsulated avirulent strain*)
- Sporicidal disinfectant should be used
Eg- 5% formalin
3% peracetic acid etc

Anthrax in Human

- Anthrax cases human are seen after occupation exposure or consumption of contaminated carcass.
- Three clinical presentations -depends upon the route of entry of spores
 - through skin,
 - by ingestion or
 - by inhalation
- The *cutaneous form of anthrax* is the most common and least severe form.
- Entry of spores through abrasion or cut skin may lead to localised lesion *i.e.* large boil or sore covered by black scab (Kradin, 2017).

Anthrax in Human

- Infection through inhalation of spore exhibit most severe *pulmonary form of the disease*
- Ch/ by haemorrhagic pneumonia and associated pleural effusion (*Wool sorters disease*)
- The initial symptoms are of high fever and difficulty in breathing. Pulmonary anthrax is often fatal.
- Gastro-intestinal form is observed following ingestion of spores, usually after eating of infected undercooked meat.
- The symptoms of *intestinal form of anthrax* are fever, abdominal pain, bloody diarrhoea and vomiting with blood.

Bacillus licheniformis

- *B. licheniformis* is widely distributed in environment
- Important organism associated with food spoilage.
- Recognised as a cause of abortion in late pregnancy in cattle.
- Feeding of silage and mouldy hay has been reported as an associated factor.
- *Necrotizing placentitis* and *fetal multifocal suppurative bronchopneumonia* is observed.

Bacillus cereus:

- *Bacillus cereus* has been implicated in cases of:
 - food poisoning in human,
 - wound infections and
 - sometimes in mastitis
- *Bacillus cereus* grows on wide variety of foods producing heat resistant toxins.
- Consumption of such food may lead into self limiting poisoning in human characterised by vomiting and diarrhoea
(Tiwary and Abdullah, 2015)
- *B. cereus* mastitis in cattle is characterised by very high somatic cell counts, though the number of cases are negligible.

Thanks