An Outbreak of Gangrenous Dermatitis in Broiler Chickens Reared on Battery Cage Operation in Umuahia, Abia State Nigeria

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Abstract

A sudden outbreak of disease occurred after a broiler flock being reared on a battery cage was treated of chronic respiratory disease. The disease was marked by a short duration, high case fatality, rapid putrefaction and severe necrosis of the abdominal region evidenced by dark areas on the skin. There were areas of gas crepitation on the leg region. Necropsy revealed accumulation of red serosanguinous fluid in the affected subcutis with marked congestion of the musculature. Culture of the affected tissues yielded Clostridial and Staphylococcal spp in addition to E.coli. A combination of the clinical signs and laboratory evidence led to the diagnosis of gangrenous dermatitis. A successful treatment was achieved with the intramuscular administration of a long acting oxytetracycline and comprehensive cleaning and disinfection of the farm.

Keywords: Gangrenous dermatitis, broiler, immunosuppresion, battery cage.
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However, there were no significant changes in the viscera in most of the birds posted.

Impression smear of the subcutaneous tissues and liver of affected birds showed a sizable population of large gram-positive rod-like bacilli. Samples from the liver, spleen and affected muscle mass were cultured. *S. aureus* and *E.coli* were isolated aerobically while *Clostridium* spp was isolated anaerobically at the Microbiology unit of the Veterinary Teaching Hospital MOUAU. However, the species of *Clostridium* could not be ascertained.

Culture and sensitivity test showed that the *S. aureus* was sensitive to streptomycine and oxytetracycline and resistant to ciprofloxacin, ampicillin, nalidixic acid, pefloxacin, gentamicin, augmentine, and tarivid. The *E.coli* was sensitive to chloramphenicol, ciprofloxacin, streptomycin, rifampicin, and levofloxacin and resistant to amoxycilin, erythromycin, gentamycin and norfloxacn.

**Treatment and Control**

Control was instituted by carrying out a comprehensive clearing and disinfection of the entire battery cage. A broad spectrum virucidal antibacterial agent, VirkonR was used in sanitizing the poultry house to reduce the microbial load. Broilers in pens 3 and 4 at the 3rd and 4th week were monitored and treated for CRD before being transferred into the cage. Based on the antibacterial sensitivity test, streptomycine at the rate of 5mg – 7mg/kg was administered orally to the birds for five days. This produced no appreciable result. Subsequently 0.5ml/kg L.A. oxytetracycline was then administered via intramuscular route using the breast muscle at the 4th week just before being transferred to the cages. This regimen achieved a marked reduction in mortalities. The disease was eliminated from the farm after the third batch of birds had undergone this treatment.

![Fig. 1: Showing moist, glistering, soft necrotic areas of the skin with obvious cellulitis around the neck and breast region.](image)
Fig. 2: Showing dark purplish discolouration of the skin around the breast and abdomen.
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Fig. 3: Showing serosanguinous exudates around the subcutis of the neck and varying degrees of necroses on the neck and wing.

Fig. 4: Showing areas of gas emphysema that ruptured leaving ulcers on the leg.

Discussion
The aetiologic components of GD, which includes; *Clostridium* spp, *Staph. Aureus* and *E. coli* are ubiquitous in nature. Whereas *Clostridium* is found in the soil, dust and animals, *E. coli* is a normal inhabitant of the digestive tract while *S. aureus* may be found in the bodies of birds and animals (Jordan and Pattison, 1998). The affected birds in this study usually sustain skin injuries while being transferred to the battery cage at the 4th week. By the 5th week while the injuries were getting healed, the anaerobic condition needed for the proliferation of the *Clostridium* was provided.

Coupled with the lowered immune status of the bird probably generated by the CRD outbreak and an unhygienic farm environment, gangrenous dermatitis ensures. Lesions of GD are often pathomonic, (Jordan and Pattison, 1998). The lesions in this case report together with the foul smell and gas crepitation were quite diagnostic of GD. *Clostridial* cultures typically emit putrid odours due to products of peptide catabolism. *C.septicum* is said to be the leading *Clostridium* in wound infections in farm animals and has been associated with the production of hemolytic toxins which are leukotoxic, necrotizing and lethal, (Biberstein and Hirsh, 1999). Generally, the disease has been associated with a lowered immunity, environmental insults and poor litter condition, (Frazier *et al.*, 1964; Saunders and Bickford, 1965; Ficken and Dennis, 1997). In this report, skin injury to the birds appeared to have played the most significant role in the emergence of the disease. The birds in the deep litter never came down with the disease asemicollon an observation that buttresses this fact. Furthermore when care was taken to reduce the injuries to the birds during transfer to the cages, the incidence equally reduced.

This report lends credence to the “outside-in” theory as Ritter, (2008) earlier on noted that since GD lesions are found close to damaged or interrupted areas of the skin, the presumed route of infection must have been through the damaged integument. The localized skin infection then produces bacterial toxins leading to enterotoxemia. Most enterotoxemia are too acute for successful treatment (Biberstein and Hirsh, 1999), thus birds are quickly killed. This probably explains why the oral antibiotics therapy was not very effective compared to the intramuscular one which could readily get to the predilection site, the integument on time. However, the treatment and control in a deep litter system may be more challenging as *Clostridium* is a spore former and can survive in the more accommodating litter conditions for quite a while.

**Conclusion**

Although GD may be difficult to eradicate as observed from other studies, a combined effort towards addressing the predisposing factors in this outbreak led to a successful treatment and control of the disease. The use of the long acting oxytetracycline administered on time, appeared to have played a major role in preventing the occurrence of the disease subsequently. Introducing it on time also means that the withdrawal period of three weeks will be observed before the broilers are slaughtered at seven weeks.

**References**


WB Saunders Comp. pp. 60-66.
Kahn CM (2010). Gangrenous dermatitis. In the Merck  
dermatitis reemerges as broilers. Watt Poult., U.S.A.  
March 38.
Immunopathol., 30; 51-65.
dermatitis in chickens and attempt at experimiental  
Convention”, St Paul. Minnesota U.S.A.
dermatitis in chickens and attempts at experiemental  
Convention”, St Paul, Minesota U.S.A.
Cooperative Extention Service. University of Georgia.  
Athens.
Willoughby DH, bickford AA, Cooper GL and Charlton BR  
(1996). Periodic Recurrence of gangrenous Dermatitis  
Associated with Clostriduim septicum in a Broiler  