

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

INANITION-EXPOSURE SYNDROME ASSOCIATED TO COLIBACILOSIS AND SEPTICEMIC LISTERIOSIS IN KITS

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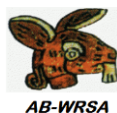
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Resumo: Este estudo apresenta o caso clínico de doze láparos, enviados ao Laboratório de Diagnóstico Animal, no Vale Mexicano, CIESA, com idades variando entre 2 a 5 dias de vida, provindos de diferentes ninhadas, cujas coelhas matrizes não apresentavam sinais aparentes de enfermidades. Em linhas gerais, o estudo anatômico fisiológico, áreas de consolidação vermelha e congestão marcada foram observadas nos pulmões; leite coagulado e conteúdo intestinal amarelado foram observadas neste órgão, como também no estômago; fígado com áreas necrosadas e congestão foram também observadas. Considerando a histologia patológica foi observado o seguinte: nos pulmões, infiltração linfocitária nas paredes alveolares e congestão; congestão e inchaço de hepatócitos e necrose multifocal no fígado; pleomorfismo nuclear no coração; gliose difusa, linfocítica perivascular, infiltração e micro abscessos no cérebro. O laudo bacteriológico mostrou isolamento de *Escherichia coli* de origem intestinal. A identificação histopatológica de micro abscessos no cérebro está associada a listeriose. A importância deste caso está

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relacionada ao fato de que no México, é pouco frequente o envio de láparos ao laboratório, para que seja determinada a causa da morte. Normalmente, exposição ou fome poderiam ter sido o único diagnóstico presuntivo associado a este tipo de caso. Desta forma, higiene e monitoramento ambiental são essenciais para garantir a saúde animal.

Palavras Chave: colibacilose, diagnostico, láparos, listeriose, saúde animal

Abstract: This study presents the clinical case of twelve kits, sent to the Animal Diagnostic Laboratory, in the Mexican Valley, CIESA, aging from 2 to 5 days old, from different litters, with does having no apparent pathological sign. In general, at the anatomo-pathological study, areas of red consolidation and marked congestion were observed in the lungs; clotted milk and yellowish intestinal contents as well as in the stomach were found; liver with necrotic areas and congestion were also seen. While for histopathology the following was observed: in the lung, lymphocytic infiltration in alveolar walls and congestion; congestion and swelling of hepatocytes and multifocal necrosis liver; nuclear pleomorphism in heart; diffuse gliosis, perivascular lymphocytic, infiltration and micro-abscesses in brain,. The bacteriological report showed isolation of *Escherichia coli* from the intestines. The histopathological identification of micro-abscesses in the brainstem is associated with Listeriosis. The importance of this case is that in Mexico, it is infrequent to have rabbits sent to laboratory, in order to determine the cause of death. Normally, exposure or starvation could have been the only presumptive diagnostic addressed to these types of cases. Therefore, hygiene and environmental monitoring are essential to ensure animal health.

Keywords: animal health, colibacillosis, diagnosis, kits, listeriosis

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Introduction

Inanition-exposure syndrome is considered as being the main cause of perinatal mortality, often associated with unfavorable weather conditions, for that reason it is usually pointed as a syndrome; which is, a combination of bad climate and lack of feeding for various reasons, which altogether, lead to the death of the newborn. The direct causes of inanition death are: starvation due to lack of milking from the mother, either from blind nipples, does malnutrition or other causes, also due to the mother's death or nest abandonment. However, there are other indirect causes, including the does' feeding deficiency in the last pregnancy stage, which causes poor body condition at the end of pregnancy, so that the beginning of lactation does not coincide with the moment of delivery. The last, can also delay the mother's recovery and the attention given to the newborn will be inappropriate, as a consequence, weakness and scarce body reserves will be observed in the newborns, as well as interference with maternal behavior and poor teat development (Winkelman and Lammers, 1998; Badiola, 2010).

The concept of exposure refers to the direct effects of climate such as extreme cold or high temperatures, rain or wind that can be responsible of the newborns death. The most susceptible animals are those that come from mothers with poor body condition and those born with low weight (independently of the cause), since there is a relationship between the weight at birth and their ability to respond to cold, hence the birth weight is important for the ability to maintain body temperature, early in life. When cold temperatures manages to lower the body temperature and cannot be recovered by the newborns, it soon leads to death. On the other hand, high temperatures can cause dehydration of the newborn, leading to death as well. Special attention should be given to the wind; which even at moderate temperatures, can cause hypothermia and also leads to death (Winkelman and Lammers, 1998, Badiola, 2010).

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High charges of environmental microbes, as well as the lack of cleaning and disinfection in the animal production units; represent a determining factor in the presentation of various diseases, which should continue to be a critical point of attention for animal health and welfare. The presence of various infectious agents can minimize the health status of rabbits (Gyles et al, 2004). So the importance of this report, when determining the cause of death of kits sent for diagnostic to CIESA, is to make evident the assessment of many risk factors and their association, which can minimize rabbit production and have a drastic effect on the rabbit farmers' economy.

Material and methods

In this work, 12 kits of 2-5 days old, from different litters, were sent to the Animal Diagnosis Laboratory, in order to determine the cause of death. According to the entry report, the kits' mothers did not present any signs of disease; data from their facilities referred to have closed spaces with windbreaks and concrete floors. An anatomo-pathological and histopathological study was carried out, as well as the request for a bacteriological study based on intestinal content.

Results and discussion

According to the scarce information presented at the admission time, taking into account the age and species, the presumptive diagnosis was associated to digestive track diseases, generally produced by enteropathogenic *E. coli* (EPEC) and *Salmonella*, leaving *Rotavirus* and *Clostridium* as the differential diagnosis. Each of these was discarded according to what was observed at the necropsy, as well as the histopathological study findings and finally the bacteriological study isolation, thus reaching to the integral diagnosis. Nevertheless, it is important to refer to the way in which the main diseases are presented.

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Infection produced by *Salmonella typhimurium* and *S. enteritidis*´ sings are presented by kits and weak animals, from birth to the second or third day of life, and are characterized by having yellowish diarrhea that stains the perineal zone. Septicemic enteritis, peritonitis and splenomegaly are also presented. As kits´ age increases, clinical features are reduced. Mortality is usually high, if kits are not treated with therapeutic measures (Kötsche and Gottschalk, 1999, Badiola, 2010).

The disease of bacterial origin, Clostridiosis, is caused by *Clostridium spiriforme*. In rabbits, it causes an enteric pathology that is often fatal. The incidence is higher in rabbits between 5 and 8 weeks of age, but rabbits from any age can also be affected. Symptoms include depression, apathy, hypothermia, anorexia, abundant liquid diarrhea; which can be hemorrhagic, dehydration and finally death, usually within the first 24 - 72 hours. The lesions are: reactive and hemorrhagic mesenteric ganglion, aqueous and bloody cecal content, diffuse hemorrhages in the small intestine and cecal hemorrhages and necrosis in the cecum (Winkelmann and Lammers, 1998).

Rotavirus causes an aqueous type of diarrhea in rabbits, which has abundant yellowish to green mucus; diarrhea ceases spontaneously 2 to 3 days after the onset of symptoms, with mortality being very low. The anatomo-pathological examination shows congested and distended intestine, with a slightly hemorrhagic intestinal liquid content, there is hepatic and renal congestion. Histologically, moderate to severe villous atrophy is observed, especially in the anterior part of the small intestine, with desquamation of epithelial cells mainly in the apical third of the villi (Kötsche and Gottschalk, 199; Carter and Chengappa, 2001).

Escherichia coli are negative-Gram bacillus that colonizes the gastrointestinal tract within a few hours of life, and establishes a stable relationship of mutual benefit with the host. As a member of the normal flora of man and many animals, it is considered a germ, indicator of fecal contamination, when its present in the environment, water and food, together with similar ones, are grouped and named

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"coliform bacteria". Although, there are different strains, the most important is enteropathogenic *E. coli* (EPEC), since it was the first group serologically identified and associated with cases of diarrhea in infants, Adherence was the main pathogenicity factor. Histopathologically they produce a characteristic lesion in the small intestine known as "attaching and effacing" (A / E), characterized by intimate contact with enterocytes, secondary alteration of their cytoskeleton, effacement of superficial microvilli with pedestal formation, modification of their water and ion flow, which altogether alters the enterocyte normal morphology at the apical region. Enteropathogenic species with different serotypes will produce the disease among individuals, depending on their characteristics.

O109: H2 and O8: H serotypes, mainly affect lactating rabbits; while O26: H11, O20: H7, O109: H7, O153: H7, O128: H2 and O132: H2 serotypes will act on weaned animals; being the O109: H2, the most severe and lethal serotype which causes diarrhea on lactating rabbits, however, this serotype does not cause diarrhea on weaned rabbits. O15: H, O103: H2 and O26: H11 serotypes produce diarrhea with high mortality on weaned rabbits. Nevertheless, EPEC causes outbreaks or isolated cases of diarrhea. This group mainly affects infants and newborns. It has a fecal-oral way of transmission, mainly due to contaminated hands of food handlers.

The main clinical manifestation is acute diarrhea, which can be from mild to severe, with vomiting, low fever and poor nutrient absorption. The disease has systemic signs, such as dehydration and cachexia, yellowish watery diarrhea, poor body condition, abdominal flaccidity and irritation in the perineal area, as well as watery intestinal content and stomach presenting undigested milk. Within the first hours of life, neonatal septicemia due to *E. coli* can develop and reach mortality close to 100%. Predisposing factors include: situations of excessive intake, intestinal hypoperistalsis and intestinal paralysis, intestinal flora modification, pH alterations or at the intestinal mucosa, as well as immunosuppression in animals or animals with

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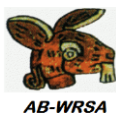
low immunity, early weaned, contaminated feed and the presence of carrier animals (Vidat et al. al., 2007).

Listeriosis is an invasive bacterial disease, produced by *Listeria monocytogenes*. Susceptibility in relation to the host immune status, plays an important role in the presentation of the disease after exposure; the host experiences a physiological or pathological defect, that affects T cell-mediated immunity, which justifies the classification of *L. monocytogenes* as an opportunistic pathogen. Its pathogenicity is due to the ability to adhere, invade and multiply within a large variety of macrophages and non-phagocytic cells (enterocytes, hepatocytes, fibroblasts, endothelial cells and dendritic cells).

Entry of *L. monocytogenes* and host tissue colonization is carried out in four stages: 1. Crossing the intestinal barrier: since it is able to withstand the stomach adverse environment, invading the intestinal epithelium. Intestinal barrier crossing occurs in the absence of intraepithelial replication. The preferred sites for bacterial replication are Peyer's plates. 2. Liver multiplication: bacteria cross the intestinal barrier through the lymph and blood stream to the mesenteric lymph nodes, the spleen and the liver. *L. monocytogenes* is rapidly removed from the blood stream by macrophages residing in the spleen and liver. 3. Pregnant uterus and fetus colonization: *L. monocytogenes* accesses fetus through the haematogenous penetration of the placental barrier. Bacterium reaches the fetal bloodstream, leading to a generalized infection and subsequent death of the fetus at the uterus or premature death of the infected newborn. 4. Brain invasion: *L. monocytogenes* invades brain by centripetal migration along the cranial nerves (Torres et al., 2005).

There are four syndromes: 1. Intestinal (subclinical) listeriosis: *L. monocytogenes* is frequently isolated from apparently normal animals. 2. Septicemic listeriosis: occurs in neonatal animals. They are visceral infections with septicemia. Adults may have bacteremia but are asymptomatic. The main clinical sign is septicemia, but gastroenteritis and meningitis may occur. 3. Abortions: after fetal

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death the product can be retained 24-72 h before abortion, which takes place during the last trimester of pregnancy. 4. Nervous or neural listeriosis: is a meningoencephalitis and is the most common form of clinical disease. The characteristic signs are directional turn, unilateral facial paralysis, unilateral corneal opacity, prostration, coma and death. The lesions are mainly found in the brainstem (bridge, medulla oblongata and spinal cord) consist of perivascular nodules of inflammatory infiltrates, composed of mononuclear cells, scattered neutrophils and lymphocytes; parenchymal microabscesses and foci of necrosis (Torres et al., 2005).

Conclusion

Due to the above, the integral diagnosis based on evidence is colibacillosis and septicemic listeriosis, associated to the inanition-exposure syndrome. Therefore, it would be important to perform *E. coli* serotyping, in order to establish a source of epidemiological data that allows us to establish the prevalence of this disease in the national rabbit breeding. The importance of considering infrequent diseases, in the submission of samples is highlighted, since in this case, lesions associated with listeriosis were identified, a process which was not initially suspected when receiving the case. At that time, shipment of encephalon and brainstem for bacteriological isolation had been avoided. The suggested epidemiological consideration of these data, is pointed towards sanitary policies formulation, aiming to the prevention of these diseases in the Mexican rabbit breeding; with the consequent decrease on injuries and premature kits death.

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