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ADDED VALUE OF LIGHTNING LOCATION DATA IN THE CONFIRMATION OF LIGHTNING-RELATED FATALITIES IN LIVESTOCK BY THE VETERINARY EXPERT

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Many veterinarians around Europe are sporadically contacted by insurance companies to advise them on the plausibility of a death by lightning impact in livestock. Confirmation of a diagnosis compatible with fatal lightning impact is always based on circumstantial evidence (e.g. position of the animal, impact in a tree...) and pathological findings. Despite its importance, very little information is available in literature to help the veterinary expert in his/her judgment of individual insurance cases. Singe lesions and the presence of feed in the oral cavity as a sign of apoplectic death have historically been reported to be present in over 80% of the lightning related fatalities (LRF's). However, in the field, veterinarians are confronted with many LRF declarations which do not show pathognomonic signs. Moreover, it occurs that farmers attempt to confuse the investigation by creating false circumstantial evidence for animals which died from other causes. To deal with this issue, several expertise veterinarians contact their national meteorological service to check whether lightning impacts were detected at the time and location of the suspected death. Whether this practice positively contributes to a correct diagnosis of LRF is currently unknown. Therefore, the objective of the present study was to determine which anamnestic, environmental and pathological factors are associated with confirmation of LRF and in specific to determine the added value of lightning location data (cloud-to-ground discharges (CG)) for predictive models for LRF in livestock.

A dataset involving 410 LRF declarations, treated by the same veterinary expert in a 15 year period was available. All cases were treated in a systematic manner, which includes collection of anamnestic data by interview, of circumstantial evidence by inspection of the conditions in which the animal was found, and of pathological information by macroscopic inspection of the animal and necropsy. A total of 23 parameters were evaluated for their possible association with LRF by multivariable logistic regression modeling and sensitivity (SE) and specificity (SP) of the models with and without CG were determined.

In the studied practice on average 23% of the yearly treated dossiers involved LRF. Most (94.6%) declarations were cattle. Of the LRF declarations, 52.8% (n=217) was rejected (negative advice) by the expertise veterinarian and 47.2% (n=194) was finally accepted as a mortality compatible with lightning (positive advice). The highest number of lightning declarations, both positive and negative advices, were systematically found between June and August. Singe lesions were present in 43.3% (n = 84/194) of the confirmed cases, and absent in all negative advices. The final multivariable model to predict a positive advice by an expertise veterinarian on a declared LRF case consisted of age (odds ratio (OR)= 1.7 (1.0-3.0) for animals > 1 year old), presence of a tree within 10 meters of the cadaver (OR= 2.3 (1.2-4.5), presence of open water within 10 meters (OR= 4.6 (2.0-11.0)), tympanic at the time of the expertise visit (OR= 13.2 (4.3-40.0)), presence of feed in the oral cavity (OR= 24.1 (9.1-64.0)) and detection of CG discharges (OR= 12.2 (5.8-25.9)) at time and location of the reported case. When only relying on CG as a predictor for LRF, the logistic model had a SE and SP of 91.2% and 41.5%, respectively. In contrast, the basic model based on all significant predictors except for CG had a SE of 53.6% and a SP of 88.0%. The best model was obtained when adding CG to this basic model which increased SE to 88.1% and decreased SP to 67.6%, resulting in a correct prediction in 78% of the declarations. This study clearly shows that solely relying on detection of CG discharges at time and location of the case, will correctly predict most of the positive cases (high sensitivity; CC detected in 94.3% of the positive cases), but performs very poor to what considers identification of negative cases (low specificity; CC detected in 58.5% of the negative cases), resulting in a large number of false positives. In contrast to what was observed for CG or CC, the basic model, constructed only on the veterinary expertise visit, has a lower sensitivity, but a much higher specificity. In other words, it is much better in identifying false positives, but lacks discriminative power for the true positives.

In conclusion, the present study shows that LRF in livestock is relatively frequent in Flanders, and is the primary reason for veterinary expertise. Pathognomonic signs are not systematically present, and wrong or fraudulent declarations are frequent. Lightning detection data are very valuable to increase the proportion of correctly diagnosed LRF's, but always needs to be combined with a veterinary expertise visit to rule out fraudulous declarations.

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CERVICAL OESOPHAGEAL PERFORATION BY A COLOSTRUM TUBE WITH METAL END-PIECE IN NEONATAL CALVES

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A cervical swelling in neonatal calves is a rather rare condition, which mostly affects individual animals, but can in certain cases involve a large number of calves within a herd. Injection related infections (abscesses, phlegmones or anaerobic infections), hematoma, callus formation after first rib fracture, thymoma, struma (hypothyroidea either by uptake of goitrogenic substances or by iodine deficiency), congestive edema due to congenital cardiac abnormalities, ectopia cordis and oesophageal injuries by application of an anthelmintic bolus (in older calves) are possible differential diagnoses, reported in literature.

In a Belgian Blue beef farm, in the past 6 months 5 out of 25 calves born, developed a marked swelling in the whole cervical region and anorexia. The lesions only occurred in calves younger than 5 days old, but neither farmer nor veterinarian could exclude whether this swelling was already present at time of birth. Treatment with prednisolone, furosemide and different antimicrobials failed and all animals died between 12 hours and 1 week after birth. A 2 days old calf with marked cervical swelling was transferred to the clinic for further examination. The calf had a normal rectal temperature, tachycardia (160 beats per minute) and tachypnea (80 breaths per minute). The cervical region was diffusely swollen from the intermandibular region up to the thoracic inlet. The jugular veins were not visible nor palpable by the swelling. The swelling was edematous, painful and a crepitation could be felt due to the presence of a limited amount of subcutaneous gaz. Thoracic auscultation showed slightly muffled lung sounds in the ventral regions. Endoscopic examination showed the presence of liquid content in the caudal part of the oesophagus, but was not diagnostic. Ultrasonographic examination with a 7,5 MHz linear probe showed the presence of subcutaneous gaz and echodense (inflamed) tissues in the whole of the cervical region, left and right. The dorsal part of the lungs showed normal reverberation artifacts, whereas the ventral part of the thorax contained free liquid. The pericardium was visualized as an echodense line, after which the heart could not be seen. Native thoracic radiographs confirmed the presence of pleural effusion and a pneumomediastinum. In the whole of the cervical region soft-tissue swelling and subcutaneous gaz was present. A barium contrast-radiograph of the oesophagus was made. This radiograph was diagnostic as it showed infiltration of barium contrast in the perioesophageal tissues in the middle third of the cervical oesophagus, consistent with a perforating oesophageal injury. The calf was euthanized. Necropsy showed a 3 cm perforating tear in the oesophagus 15 cm's after the larynx. A fibrino-necrotising (peri)oesophagitis, tracheitis and myositis of the cervical muscles was present. Thoracic lesions involved a pyothorax, pneumomediastinum and pericardial emphysema. After diagnosis, these fatal oesophageal injuries could be linked to the use of a tube for colostrum administration with a metal end-piece.

In conclusion, this case report shows that cervical swellings in multiple neonatal calves can be related to the wrong use of a oesophageal tube or to the use of a non-adapted tube for the animal species. Veterinarians should be aware of the possibility of this issue and should be able to advice farmers on the correct use.

NECROSIS TUBULAR AGUDA EN TERNEROS DE RAZA RUBIA GALLEGA: ESTUDIO ECOGRÁFICO

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RESUMEN

Presentamos tres casos de necrosis tubular aguda (NTA) en terneros de raza Rubia Gallega, una hembra de 1 mes de vida y dos machos con edades de 14 días y dos meses y medio respectivamente, en los que tras realizar un estudio ecográfico, aparece una imagen de riñón invertido. Esta lesión puede ser compatible con una etiología congénita, vascular, infecciosa o tóxica.

SUMMARY

We present three cases of acute tubular necrosis (ATN) in Rubia Gallega calves, a female 1 month old and two males aged 14 days and two and a half months respectively, which after performing an ultrasound study, featured a kidney inverted image. This lesion can be compatible with a congenital, vascular, infectious or toxic etiology.

Casos clínicos: descripción de los casos

En los últimos años, en el Servicio de Atención de Animales de Renta del Hospital Veterinario Universitario Rof Codina (HVU-RC) se han hallado varios casos clínicos de NTA de pronóstico grave y evolución mortal.

Los terneros se remitían al Servicio de Grandes Animales con una sintomatología inespecífica que cursaba principalmente con apatía, disminución del apetito, diarrea y falta de respuesta al tratamiento administrado, el cual consistía en la combinación de diversos antibióticos, tales como enrofloxacina y gentamicina-amoxicilina.

Tras realizar un estudio laboratorial de las muestras de sangre, se observa en los tres casos las siguientes alteraciones en la bioquímica: el nitrógeno ureico sanguíneo (BUN) era superior a 51 mg/dl (rango normal: 7-17mg/dl); los valores de creatinina en sangre fueron superiores a 5.2 mg/dl (rango normal: 0-2 mg/dl) y, por último, la concentración de albúmina fue inferior a 1,8g/dl (rango normal: 2,5-3,6g/dl).

Los resultados de las hematologías no mostraron hallazgos anormales significativos.

En cuanto al análisis de orina, se observó una clara hipostenuria, con una densidad urinaria por debajo de 1.010 g/l (rango normal 1.020-1.040 g/l) lo cual nos indica la incapacidad del riñón para concentrar la orina.

Tras realizar una tira de orina, se apreció un pH ácido (pH 6), presencia de leucocitosis y una marcada proteinuria, siendo esta última indicativa de un daño renal.

Teniendo en cuenta todos los resultados obtenidos, se decide realizar un estudio ecográfico de los riñones para confirmar dicho diagnóstico, en la cual se aprecia una inversión de la médula renal, siendo ésta hiperecogénica respecto de la cortical, cuando lo normal es que la médula sea hipoecogénica con respecto a la corteza renal (Figura 1). Además, en uno de los terneros, también se aprecia un sedimento en la vejiga de la orina, sin celularidad en suspensión y con engrosamiento de la pared.

Dichos hallazgos ecográficos son compatibles con una nefropatía congénita, tóxica o infecciosa.