

A STUDY CASE CONCERNING RENAL AMYLOIDOSIS IN CATTLE

UN STUDIU DE CAZ PRIVIND AMILOIDOZA RENALĂ LA BOVINE

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ABSTRACT | REZUMAT

Renal amyloidosis is a rare condition in cattle. The diagnosis of this disease was established post-mortem for the first time in our clinic in an 8-year old Holstein cow, which presented profuse diarrhea, ventral edema and decreased appetite.

The biochemical analysis of blood and urine revealed: anemia, hypoproteinemia, uremia and severe proteinuria.

At necropsy, the kidneys were enlarged, yellow (waxy aspect) and with firm consistency on the surface of section.

By histopathological exam of smears stained with Congo Red, there was confirmed the renal amyloidosis by presence of amyloid deposits in renal glomeruli.

Keywords: renal amyloidosis, cattle

Amiloidoza renală este o afecțiune rară la bovine. Diagnosticul post-mortem al acestei afecțiuni a fost pus pentru prima dată în clinica noastră la o vacă de 5 ani din rasa Holstein, la care clinic s-a observat: diaree profuză, edeme declive și scăderea apetitului.

La examenul biochimic al sângelui și al urinei s-au decelat: anemie, hipoproteinemie, uremie și proteinurie severă. La examenul necropsic s-a observat: hipertrofia rinichilor, culoarea gălbuie conferindu-le "aspectul de ceară" și consistența fermă pe secțiune.

La examenul histopatologic al frotiurilor colorate cu Roșu de Congo a fost confirmată amiloidoza renală prin decelarea depozitelor de substanță amorfă, eozinofilică în glomerulii renali.

Cuvinte cheie: amiloidoză renală, bovine

Amyloidosis is a condition characterized by extracellular deposit of protean matter (amyloid) in the majority of tissues and organs.

The amyloid is composed by different proteins of plasmatic origin, with small molecular weight (5-25 kD), that have the particularity to form insoluble fibrillar structures.

The renal injury is especially at the glomerular level and it manifest by nephrotic syndrome with important edema and unselective proteinuria.

The evolution of malady is rapid to chronic renal insufficiency and death [4, 5, 6, 8, 10, 11].

MATERIALS AND METHODS

An 8-year old Holstein cow with profuse diarrhea, ventral edema and decreased appetite was examined in our clinic. The biochemical analysis of blood and urine revealed anemia, hypoproteinemia, uremia and severe proteinuria.

The diagnosis of this disease was established post-

mortem because at necropsy the kidneys were enlarged, yellow (waxy aspect) and with firm consistency on the surface of section. There were taken also the kidney samples for histopathological examination.

The samples preparation was carried out as follows: fixation in alcohol, 24 h, at room temperature (in order to prevent the tissue alteration due to the enzymes activity, preserve the tissue texture and improve the optical differentiation), alcohol dehydration in five steps with 70, 80, 90, 100% and 100% alcohol, each step for two hours, clearing with benzene, paraffin wax at 56°C, embedding tissues into paraffin blocks, trimming of paraffin blocks (6 μm), mounting of sections on the glass slides (using Meyer albumin) and Red Congo staining [7, 9].

RESULTS AND DISCUSSION

By necropsy, there were showed: catharal enteritis, ventral edema and enlarged, yellow and waxy kidney with swollen, whitish-yellow, discolored and irregularly surfaced lobes, caused by dilatation and degeneration of tubules, interstitial inflammation and fibrosis. These tubule-interstitial lesions are secondary to glomerular dysfunction resulting from amyloid deposition (Fig. 1).

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Fig. 1. Cow kidney. Renal amyloidosis, macroscopic aspect.

It can be observed a deposit of amyloid on the inner face of glomerular basal membrane (stained in violet). In some places, penetration of the basement membrane by small spicular projections of amyloid at its outer face has occurred. It can be observed also the neighboring of tubules that contain pink protean material with violet casts. Congo red-stained glomerular amyloid has an orange-red appearance in the mesangium and capillary loops, that confirm the diagnosis of renal amyloidosis (Fig. 2).

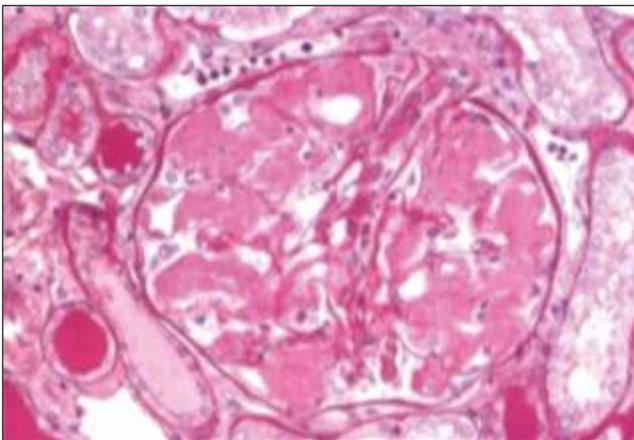


Fig. 2. Cow kidney. Renal amyloidosis, microscopic aspect (10 x 40). Red Congo staining.

CONCLUSIONS

At the clinical examination of animal by trans-rectal examination, it was observed: a large, firm and circular shaped kidney.

The laboratory analysis revealed hypoproteinemia and severe proteinuria. At the necropsy, the kidneys were enlarged, yellow and waxy.

The confirmation of diagnosis was made taking into account the histopathological examination of the kidney by Congo Red staining. The presence of the orange-red material in the mesangium and capillary loops confirmed the diagnosis of renal amyloidosis.

It is the first time when the diagnosis of renal amyloidosis in cattle is established in our clinic. The liver amyloidosis was met with quite low frequency in dogs.

Acknowledgments

This research work was carried out with the support of the project: "The development of research, education and service infra-structure in the domain of veterinary medicine and innovative technologies for RO 05", code SMIS-CSNR 2669.

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