

6-Summary

The present work was carried out on 100 abattoir native breed animals (85 bulls and 15 cows) of different ages to study the pathological affections of the whole urinary system (organs and tract) with special attention to urolithiasis.

After gross examination and description, tissue specimens were taken from right and left kidneys, the anterior part of both right and left ureters and the whole urinary bladder. The kidneys were incised sagittally through cortex, medulla and renal pelvis. Specimens were also taken from detectable renal lesions if present, or a representative specimens.

The urinary bladder was thoroughly examined by palpation and incision searching for any foreign material (calculi, blood clots) or any other lesion. The degree of urinary bladder fullness or distension were observed and the physical properties of the urine (aspect, consistency and color) were also reported. Pathological cases of the kidneys were associated with lesions of various pictures that included acute focal interstitial nephritis (51 cases), chronic focal interstitial nephritis (2 cases), embolic suppurative nephritis (2 cases), renal calculi (4 cases), single case of cystic kidney associated with renal calculi, nephrocalcinosis (13 cases), associated cases of nephritis and nephrocalcinosis (10 cases) and acute tubular necrosis (2 cases).

In our material, the lesions of acute focal interstitial nephritis were bilateral and multifocal in the majority of cases and involved the inner medulla in few cases. Chronic lesions were observed in only two cases and characterized by development of excessive fibrosis. A special type of interstitial nephritis, which may be result from a delayed hypersensitivity, was found. In that single case, characteristically focal numerous eosinophilic infiltration appeared in the renal cortex admixed with a greater number of neutrophils especially adjacent to the glomerulus and within the Bowman's capsule. Acute and chronic renal angiopathy lesions were common in many

cases of interstitial nephritis. In some cases, these renal vascular lesions were associated with similar lesions in blood vessels of urinary bladders and ureters of the same cases which indicate the presence of systemic reaction. In our material, two cases of acute tubular necrosis were found. The necrotic changes were diffuse throughout the cortex in irregular manner. Two cases of multifocal embolic suppurative nephritis were found. These cases were associated with acute focal interstitial nephritis which may indicate a wide variety of pyogenic and non-pyogenic microorganisms that invaded the renal tissue and suspected to be at short intervals. In our study, we found a single case of unilateral most probably acquired renal cyst associated with renal calculi. In this case, inflammation and stone formation may indicate a strong link between infection, nephrolithiasis and cyst formation.

In the present investigation, nephrocalcinosis and urolithiasis including renal calculi were found in 16 cases. The observed five cases of renal calculi may be of struvite type (magnesium ammonium phosphate hexahydrate). The majority of nephrocalcinotic cases showed focal interstitial nephritis (10/13 cases; 70.7%). Under certain circumstances, the mineral salts precipitate from solution and crystallize about foci of organic material. From histopathological picture of nephrocalcinotic and nephrolithiasis cases, we can conclude that inflammation play an important role in induction of such conditions by providing organic nidi.

Infection, dietary mineral imbalance, insecticides, drugs, limited water intake or drinking from wells may independently or multifactorially contribute to nephrocalcinosis and or nephrolithiasis in cattle.

In our material, only one case presented mild congestion of the ureter grossly. Lymphocytic ureteritis in the form of focal and diffuse lymphocytic infiltration of the submucosa was the common microscopic picture. Many cases of ureteritis were associated with both nephritis and cystitis which reflect descending infection in some cases and indicate systemic reaction in

other cases when it was accompanied with generalized angiopathies. A single unique case of ureteral fibroadenocarcinoma was found.

The urinary bladder suffered from various types of inflammatory conditions due to viral, bacterial or parasitic causes.

In our study, we recognized four types of cystitis, simple acute catarrhal, acute hemorrhagic, chronic and chronic polypoid cystitis. Most examined cases of cystitis were associated with nephritis which may prove descending infection. However, pathological changes indicating systemic infection as common vascular changes especially bilateral were observed.

In our material, bladder calculi were found in three cases with an incidence of 3%. Two types of bladder calculi were found, namely in the form of sand-like yellowish material precipitated on the mucosa, and chalky material which aggregated to form large particulated bodies filling the urinary bladder lumen.

According to the macro and microscopical findings, cystic calculi tends to result from already present nephrolithiasis or from long-standing cystitis of exudative type.

Our results may provide the evidence of the relationship between cystitis from one side and between cystic calculi and mucosal hyperplasia from the other side. It appears that continuous mechanical irritation of calculi stimulates the epithelium to hyperplastic changes. Invasion of the microorganisms aggravate the condition by changing the urine pH and its direct effect on the urothelium leading to ulcerative cystitis. The desquamated epithelium and delirious products of inflammation may provide an organic nucleus for formation of cystic calculi. Chemical irritation of urine may also be a cause of mucosal hyperplasia.

In our experimental study, a total number of 28 male albino rats were divided into two main groups (group A and group B). The rats of group A were fed a basic diet (deficient in Mg) while the rats of group B were fed the

control diet (supplemented with Mg). All experimental animals were injected i.p. with a dose of 1 ml containing 30 mg/kg body weight of tetracycline at the beginning of the experiment. A second fluorescent substance (2,4 Dis) N,N-di (carboxymethyl) (Amino methyl fluorescein) DCAF was injected i.p. at a dose level of 30 mg/kg body weight half an hour before sacrifice. Fresh 15um frozen sections were prepared from the kidneys of laboratory animals and were directly mounted in glycerin for fluorescent microscopy. The tissue specimens of both abattoirs animals and laboratory animals were fixed in formalin solution and processed. Sections were stained by H&E, PAS, and Von Kossa stains.

Our experimental study was undertaken in order to investigate the dynamics of formation and growth of the renal calculi under the condition of Mg deficiency as a model. Combination between fluorochromes such as tetracycline (TC) or DCAF and calcium can be used as an aid to further elucidate the mechanism of calculinosis. Double labeling with TC and DCAF can provide a reliable method to study the morphogenesis and mobility of renal calculi through differentiation between old and recently deposited calcium salts in the area.