HISTOPATHOLOGICAL OBSERVATIONS OF HYDRONEPHROSIS IN SHEEP (OVIS ARIES)*

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ABSTRACT

The present was undertaken during period of June, 2015 to December, 2015 to elucidate the occurrence of hydronephrosis in sheep. A total number of 1,298 specimens of kidney of sheep were examined irrespective of age, sex and breeds in North-West Rajasthan. Out of these, 211 specimens of kidney suspected for abnormalities were further processed for histopathological examination. This condition was recorded in 7 (3.31 per cent) cases. Grossly, kidneys were swollen and enlarged due to progressive dilation of pelvis and calyces and atrophy of the renal parenchyma. The cortex and medulla became thinned. The normal renal structure was finally replaced by a large enormous sacculated bag, which was filled with watery fluid. Microscopically, the affected kidney revealed atrophy of renal parenchyma, dilation of proximal convoluted tubules and shortly there were dilation of distal and straight tubule. Atrophy of the tubular epithelium was also seen. Mononuclear infiltration was observed in the surrounding interstitial tissue. There were cystic dilatations in pelvis, calyces and in surrounded tubules. The mucosa of tubules showed degeneration, infiltration and desquamation. The atrophied area became separated and replaced by diffuse cortical fibrosis. In some cases, the glomeruli and cortex showed extreme atrophy. There was atrophied renal tubular epithelium with collapsed glomeruli.

Key words: Sheep, hydronephrosis, histopathology.

Introduction

India had an enormous sheep population 65.06 millions which contributes 12.71 per cent of total livestock population in the country. In India, out of this sheep population, Rajasthan possesses 13.95 per cent. Rajasthan had around 16 per cent sheep of total livestock population of state (19th Livestock Census, 2012). Sheep has tremendous potential of maintaining its production ability of utilizing low quality fodder to yield animal products like mutton, wool, milk, hide and manure. Distribution wise, their concentration is higher in desert or hilly tracts where climate remains unfavourable during most of the part of year and the vegetation is scanty. The production of wool, meat and manure provide three different sources of income to the shepherd. It has tremendous potential of maintaining its production ability of utilizing low quality fodder to yield animal products. Various pathogenic organisms and toxins enter the blood stream and bound to pass the liver and kidneys. Kidney is one of the most intriguing and challenging organ to the pathologist, both as regards to the altered structure and disturbed function. (Boyd, 1961). Therefore, it becomes pertinent to study the renal affection in sheep. The present study has been carried out for the occurrence and pathology of congenital polycystic kidney.

Materials and Methods

In the present study, a total of 1,298 samples of urinary system in sheep were examined grossly for pathological conditions, in which 211 samples of kidney showing frank gross lesions were collected in 10 per cent formal saline for further histopathological examination. For histopathological examination, processing of tissues was done by paraffin embedding using acetone and benzene technique (Lillie, 1965). The tissue sections of 4-6 micron thickness were cut by help of hand operated microtome and stained with haematoxylin and eosin staining method as a routine. As far as possible, results were recorded by gross observations and microphotographs.

Results and Discussion

This condition was recorded in 7 (3.31 per cent) cases. A lower incidence was recorded by Rajzaie et al. (2014) as 0.08 per cent and by Tavassoly (2003) as 2.33 per cent. Higher incidence was recorded by Yener and Erer (2000) as 10.12 per cent.

Fig. 1: Microphotograph of hydronephrosis showing dilated tubules and atrophy of the tubular epithelium. H & E 100X.
Grossly, kidneys were swollen and enlarged due to progressive dilation of pelvis and calyces and atrophy of the renal parenchyma, are in accordance with the observations of Jubb et al. (1993). The cortex and medulla became thinned. The normal renal structure was finally replaced by a large enormous sacculated bag, which was filled with watery fluid.

Microscopically, large sac like dilated cystic areas in the renal tubules, increased connective tissue in kidneys, extremely atrophied cortex and glomeruli with mononuclear infiltration in the surrounding interstitial tissue and atrophied renal elements in unilateral hydronephrosis (Fig. 1). The above observations are in accordance with those described by Dennis (1979) and Ghanem et al. (2015).

This condition might be occur due to obstruction to free flow of urine. It may be congenital or acquired. Among the causes for acquired are: (a) calculi, (b) tumour of renal pelvis, ureter, bladder and urethra, (c) haemorrhagic cystitis and (d) compression (Sastry and Rao, 2001).

References

Hydronephrosis (plural: hydronephroses) is defined as dilatation of the urinary collecting system of the kidney (the calyces, the infundibula, and the pelvis). Hydronephrosis in fetuses and newborns has specific causes that are covered in a separate section. Following the identification of hydronephrosis, appropriate further investigations must be undertaken to establish an underlying cause, with potential etiologies including everything from urolithiasis, UPJ obstruction, malignancy such as cervical cancer and retroperitoneal fibrosis. A nuclear medicine diuretic renogram may be performed to assess for obstruction of urine and differentiate from other causes such as an extra-renal pelvis or parapelvic cysts. Background: The degradation of the steppe of Inner Mongolia, due to overgrazing, has resulted in ecosystem damage as well as extensive reductions in sheep production. The growth performance of sheep is greatly reduced because of overgrazing, which triggers massive economic losses every year. The liver is an essential organ that has very important roles in multiple functions, such as nutrient metabolism, immunity and others, which are closely related to animal growth. Hydronephrosis describes hydrostatic dilation of the renal pelvis and calyces as a result of obstruction to urine flow downstream. Alternatively, hydroureter describes the dilation of the ureter, and hydronephroureter describes the dilation of the entire upper urinary tract (both the renal pelvicalyceal system and the ureter). The signs and symptoms of hydronephrosis depend upon whether the obstruction is acute or chronic, partial or complete, unilateral or bilateral. Hydronephrosis that occurs Morphological and histopathological study of large intestine of goats infected with Trichuris ovis revealed the embedded attenuated anterior end in mucosa, surrounded with fibroblast and leucocytes in histopathological sections. There was no sign of fibrosis and necrosis. Crypts of Leiberkuhn, muscularis mucosa, submucosa and muscularis externa were clearly differentiated with slight infiltration of inflammatory cells like mononuclear cells, leucocytes, goblet cells along with epithelial changes and overall mucosal architecture in vicinity of worm penetration. However, clinical diseases due to T. ovis have been reported in sheep and cattle (Kuchai et al. 2013). Heavy infection may be observed in very young lambs.