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## Studies on prevalence and epidemiology of obstructive urolithiasis in pashmina goats of Ladakh region in Jammu and Kashmir

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### Abstract

Urolithiasis is a common problem in small ruminants and causes great economic loss to owners in form of mortality and cost of medication. A detailed study was carried to know the pattern of occurrence of obstructive urolithiasis in pashmina goats of Ladakh and to identify some of the major etiological factors responsible. One Hundred (100) pashmina goats of All India Co-ordinated Research Project on Changthigi Goats (ACRIP-CG) were screened for obstructive urolithiasis for a period of 3 years from September 2014 to September 2017. Goats with history of urinary retention and other related clinical signs were classified as having urolithiasis. The data so generated were analyzed to find the occurrence (%) and distribution of cases according to age, sex, season, and castration status. During this period 14 cases of urolithiasis were reported, which constituted a farm incidence of 4.66%, only male sex were affected and age-wise farm prevalence of obstructive urolithiasis was 42.85% (6/14) in below 2 years age group and 35.71% (5/14) in age group of 2-3 years and 21.42% (3/14) in the age group of 2-3 years age. Highest number of cases of urolithiasis were observed in winter 7 (50%), followed by spring 3 (21.42%), summer 2 (14.2%) and autumn 2 (14.2%). Out of total goats affected with urolithiasis 10 (71.42%) were castrated and only 4 (28.57%) were not castrated.

**Keywords:** Pashmina goat, obstructive urolithiasis, Leh and epidemiology

### 1. Introduction

Uroliths are concretions of solid mineral and organic compounds that cause disease through direct trauma to the urinary tract and obstruction to urinary outflow [1]. The condition becomes serious if urolith lodges at such a site in the urinary tract which causes obstruction to flow of urine, thus giving rise to a clinical emergency called as obstructive urolithiasis [2]. If left unattended mortality rates can become high due to rupture of urethra or urinary bladder resulting in death of animal due to peritonitis and toxemia [3, 4]. Earlier studies have reported that only 10% cases of urolithiasis might show signs of obstruction, while rest remains asymptomatic. In India incidence of urolithiasis is very high in the states of Punjab, Haryana, Uttar Pradesh, Bihar, Madhya Pradesh, Orissa, Andhra Pradesh and Tamilnadu [5, 6]. The etiology of disease is complex and multifactorial and is known to have many predisposing factors like age, type of feed and water, season, castration which play an important role in pathogenesis of disease [2]. Factors such as diet, age, sex, breed, genetic makeup, season, soil, water, hormone, mineral, and urinary tract infections play an important role in the genesis of urolithiasis [7]. Young goats and calves are frequently affected with this frustrating condition [8]. The calculi are mostly found at urinary bladder and less commonly in renal pelvis and urethra [9]. The calculi dislodged from bladder may get trapped in narrow male urethra, Sigmoid flexure or at preputial opening [10] which result in complications seen in obstructive urolithiasis.

Clinical signs observed in obstructive urolithiasis results due to failure of excretory process and accumulation of waste products in the body with fluid and electrolyte disturbances and pain due to distention of bladder by accumulated urine [11]. As the bladder continues to distend, the animal exhibits signs of pain reactions until perforation of the urethra or rupture of bladder which inevitably end up in death of the animal [12].

### 2. Material methods

The study was conducted on 100 Pashmina goats of All India Co-ordinated Research Project of Changthangi goats (AICRP-CG), maintained at High Mountain Arid Agricultural Research Institute (HMAARI), Leh during the period of 3 years (September 2014 to September 2017). The urolithiasis in goats was diagnosed mainly based on the clinical history of urinary

retention, clinical signs and physical examination. According to age group the goats were grouped into 3 groups, animals below 2 years age, animals 2-3 years age and animals 3-4 years age. Data was collected considering common epidemiological factors like breed, age, season, sex and castration.

### 3. Results

During the study period a total of 14 animals were diagnosed for obstructive urolithiasis which constituted an overall farm prevalence of 4.66%. All the animals affected were male and no female was affected showing prevalence in males and females as 4.66% and 0% respectively. On the basis of age prevalence of obstructive urolithiasis was 42.85% in below 2 years age group, 35.71% in age group of 2-3 years and 21.42% in the age group of 3-4 years. The number of goats affected according to seasons was 14.2% in summer, 14.2% in autumn, 50% in winter and 21.42% in spring. Out of the total goats affected with urolithiasis 71.42% were castrated and only 28.57% were not castrated.

### 4. Discussion

In the present study, all the goats affected with urolithiasis were males and no female was affected. Although urolithiasis can affect both sexes but no female suffered from urolithiasis in our study which may probably be attributed to lesser number of animals in present study. Increased prevalence of obstructive urolithiasis in males as compared to females found in our study is in accordance with the findings of earlier studies [14, 15]. Earlier study [16] have attributed increased prevalence of obstructive urolithiasis in male to the anatomical differences in conformation of urinary tract between the sexes, males having long and tortuous urinary tract, while as females have a shorter and wider urethra which allows the passage of any formed urolith [17].

In present study, higher prevalence of urolithiasis 42.85% was observed in goats below 2 years age group, followed by 35.71% in age group of 2-3 years and 21.42% in the age group of 3-4 years age group. Our results are in concurrence with earlier studies [18, 19, 20] which have also reported higher prevalence of urolithiasis in goats below 6 months of age group. Higher prevalence in goats below 2 years may probably be due to due to feeding of high proteinaceous diet during early age, changes brought about by weaning [21] or due to the underdeveloped (narrower) urethral process [22]. Earlier studies [23] have reported similar findings in bovines with 89% cases of urolithiasis between the ages of 2 to 6 months.

In the present study higher numbers of goats affected with urolithiasis were in winter season that is 50%, followed by spring 21.42%, summer 14.2% and autumn 14.2%). Higher prevalence of urolithiasis observed in winter (50%) is in conformity to early findings [24]. Higher prevalence of obstructive urolithiasis in winter may be attributed to reduced water intake in winter [25], deficiency of green fodders thus causing vitamin A deficiency and feeding of more concentrates having high mineral content [26].

Higher prevalence of urolithiasis 71.42% in our study was found in castrated as compared to non castrated (28.57%) which is in accordance to findings of [27], who reported that young castrated male goats are more commonly affected with urolithiasis than the intact or adult animals. Higher prevalence in castrated animals may be due to effect of lack of testosterone. Lack of testosterone in early life causes penile hypoplasia thus decreasing the bore size of urethra and failure

of urethral process to mature [28]. Lack of testosterone also decrease the hydrophilic colloids in urine and tends to cause calculus formation [29].

### 5. Conclusion

Obstructive urolithiasis is a serious condition affecting pashmina goats. The prevalence of obstructive urolithiasis is higher in castrated male goats as compared to non castrated goats. Maximum numbers of cases of obstructive urolithiasis are seen in goats below 2 years of age and according to season maximum cases of obstructive urolithiasis are observed during winter season.

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