

A Brief Note on Pathology of Uterine Abnormalities in Goats

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Abstract

Goat was the earliest ruminant and probably first animal after dog to be domesticated by man. Due to its economic viability, goat is also called the poor man's cow and it is an essential component among livestock in agriculture-based production system. Around 80% of the global goat population is in the developing countries. India holds second largest population of goats and stands first in goat milk production and is the second largest in goat meat production with an annual growth rate of 2.6% and 2.4%, respectively. Among small ruminants, main factors which affect production are lack of good management, reproductive disorders, harsh climatic conditions and diseases. Goats attain early sexual maturity with regular and successful reproduction and producing about two kids per year with 20–30% twinning. But due to genital problems among female goats this target is not attained. Reproductive tract diseases are more common in female goats as compared to male goats due to hormonal effects. Reproductive abnormalities inflict a huge economic loss by causing either infertility or sterility in animals. Uterine and ovarian lesions are more common in animals and these greatly contribute to sterility or infertility and thereby reduce the enterprise.

Keywords: Goats, uterus, abnormalities, lesions, endometritis

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INTRODUCTION

The incidence of various reproductive organs disorders of goats varies from 1.9–21.2% [1, 2]. Besides reproductive health status, the hypothalamo-pituitary abnormalities diagnosis and the influence of external hormonal sources on the individual animal are reflected by the nature of uterine lesions [3]. The uterus exhibit highest level of diversity and frequency of lesions among all the genital system segments studied in goats [2].

Congenital anomalies of uterus are rare among domestic animals and mostly associated with inbreeding and intersex conditions [4]. Intersexes are relatively common among dairy goat breeds [5]. Bilateral uterine agenesis, uterus unicornis (hemiuterus), segmental aplasia and uterus didelphys are described in association with freemartins and genetical intersexuality [6]. The pregnancy rate is decreased in postpartum uterine lesions such as metritis, clinical and subclinical endometritis, and pyometra [7].

Among 51 black Bengal goats, uterine abnormalities were found to be 35.2% and uterine infection in 27% by Rahman *et al.* [8].

Uterine disorders, primarily nonspecific infections, reduce reproductive efficiency of dairy cows [9]. Ewes with cystic ovaries have higher prevalence of uterine abnormalities due to increased plasma progesterone concentrations and can reduce uterine resistance to bacterial infection [10, 11]. In ewes the effect of uterine infection and subsequent immune response may directly be exerted on the ovary or indirectly by suppression of LH secretion [12, 13].

DIFFERENT UTERINE ABNORMALITIES IN GOATS

Endometrial atrophy results from ovarian inactivity. It is characterised by a thin, flat and greyish endometrium with no evidence of caruncles [14].

Pyometra is the accumulation of pus in the uterine lumen as a result of acute or chronic suppurative uterine infection with closed cervix [15]. It is a hormonally-mediated diestral disorder due to cystic endometrial hyperplasia [16]. Increased progesterone secreted by the persistent corpus luteum makes uterus susceptible to infection. Pyometra can arise from an on-going specific bacterial

infection such as campylobacteriosis [5], *Escherichia coli* and *Proteus* with foetid odour or nonspecific uterine infections especially during the puerperal period. Grossly, the condition appeared as large uterus full of mucopurulent exudates and histologically large amounts of neutrophils and fibrin were observed in the endometrial epithelium [17]. Most significant microscopic feature was endometrial hyperplasia and enlarged columnar, vacuolated progestational epithelium with small pyknotic nuclei.

Mucometra and *hydrometra* are conditions characterised by uterine distension by mucinous and watery fluids, respectively in association with endometrial hyperplasia or a distal uterine tract obstruction [14]. Hydrometra is a significant factor causing infertility and infertility in individual goats following embryonic death rather than oestrous without conception. Increased incidence of the occurrence of hydrometra in pseudo pregnant does suggest that there were indications for genetic influence [18]. Grossly it appeared as an enlarged and distended uterine horns containing 1–2 l of thin fluid mixed with flakes and histopathologically, endometrium and myometrium had changes of pressure atrophy, with mononuclear cell infiltration in lamina propria. Histologically, desquamated endometrium covered with pinkish blue homogenous material and endometrial glands were in various stages of degeneration and periglandular fibrosis.

Cystic endometrial hyperplasia (CEH) is a progressive and pathological endometrial expansion caused by an increase in the size and number of endometrial glands [19]. Cystic endometrial hyperplasia has been commonly described in dogs and cats, but rarely in other species [20]. The condition occurs in goats due to prolonged oestrogenic stimulation and presence of follicular or luteal cyst in association with mucometra or hydrometra [4]. In goats, the condition is reported in association with a cystic graffian follicle and granulosa–thecal cell tumour [2]. Grossly, the affected uterus appears flabby and diffuse endometrial thickening by numerous clear fluid filled cysts. The endometrium was markedly expanded by many irregular cystic and hyperplastic glands [21]. Histologically it

is characterised with endometrial glandular hyperplasia and hypertrophy with clear to foamy cytoplasm together with stromal oedema and inflammatory cell infiltration. Uterine cavity contains fluid covering the gelatinous mucous membrane.

Endometritis refers to the inflammation of endometrial lining of uterus. According to the part(s) of the uterus involved inflammatory lesions in uterus are named as metritis, endometritis, perimetritis and parametritis. In India, endometritis was described as the most common pathological condition of adult goats, whereas a lower incidence of endometritis was reported in local nondescript goats [22]. Grossly, the affected uteri were hyperaemic, oedematous and showed deep blackish red coloured pigment on the surface of the uterine horn [23]. Histopathological examination revealed multifocal erosions of the superficial epithelium, inflammatory reaction beneath the mucous layer [1, 13] and infiltration with neutrophils, lymphocytes and plasma cells along with mild amounts of cellular debris and hemorrhage. In chronic endometritis, focal or multifocal white to grey foci or nodules and in some cases cysts of about 1–5 mm in diameter were observed; the palpable nodules were firm in consistency and some were necrotic and gritty on incision.

Uterine inflammation is due to either specific diseases such as tuberculosis or nonspecific infections following breeding or parturition, especially in retention of the placenta. Isolation and identification of the organisms is essential for diagnosis. Mineralization of the cotyledons due to necrosis along the chorionic and basophilic granular debris and necrotic placentitis are characteristics of *T. gondii* infection of pregnant uterus. Brucellosis is reported as one of the most important infectious causes of reproductive disorders in domestic animals. Pronounced histopathological changes in genital tract seen in brucella infection are different forms of endometritis mainly ulcerative with multifocal desquamation of surface epithelium and its basement membrane [24]. Granulomatous lesions indicate the chronicity of the condition and the bacteria multiply within the cytoplasm of the phagocytes which are transformed into epithelioid cells. Around these cells

lymphocytes, Langhan's giant cells and plasma cells accumulate [25]. Colonization of the organism in trophoblastic cells of the placenta results with abortion [26]. Necrosis of caruncles, endometrial ulceration, severe suppurative metritis and numerous surface bacterial colonies were present in uteri [27]. In cattle *Chlamydophila pecorum* causes purulent endometritis.

Post-parturient metritis has been grossly described as unilateral or bilateral uterine distension by luminal sero-sanguinous to chocolate coloured exudates. Mucosal oedema, hyperaemia (in some cases) and haemorrhage were the main features seen [2]. Rainy season is favourable for metritis [9]. Chronic metritis affects the fertility of the goat.

Adenomyosis is the invasion of the muscular wall of an organ by glandular tissue. It is regarded as a rare lesion in domestic animals including goats [14]. Adenomyosis occur in goats of all age groups. In goats, the lesion has been described in association with hyperoestrogenic states [28]. The aetiology of adenomyosis is idiopathic. Metaplasia or malformation of myometrial tissues and hyperplastic growth of endometrial tissues into myometrium have been postulated as possible mechanisms of adenomyosis development [15].

CONCLUSION

Goats are highly prolific animals with two kids per year regularly and they attain sexual maturity at an early age. However, due to pathological problems related to genital tract in female goats such prolificacy often fails to be attained. Various studies suggested that uterine lesions in animals results into sterility or infertility of the animal and this cause economic losses for farmers. Therefore it is better to screen the animals for various kinds of infections affecting the reproductive tract especially uterus and adopt preventive measures to save the animals as well as the productivity.

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