HISTOPATHOLOGICAL STUDY OF NATURALLY OCCURRING PATHOLOGICAL CONDITIONS OF UTERUS AFFECTING REPRODUCTION IN SMALL RUMINANTS

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ABSTRACT

The study was conducted to assess the histopathology of genital tract diseases of small ruminants (n=638; sheep 267 and goats 371). Out of the total sheep and goat genitalia examined, 19 (7.11%) and 30 (8.08%), respectively, had uterine abnormalities. Pregnancy was recorded in 11.59 per cent of the abattoir goat genitalia and 7.86 per cent of ewe genitalia. Histopathologically, gravid uterus revealed an increase in the size and number of endometrial glands, sparse stroma and increased cellularity of the surface epithelium. Uterus with pyometra revealed dilated and hyperplastic endothelial glands variably filled with pus. Uterus with hydrometra revealed variably dilated lumen with thin wall or flat in appearance and the variable sized areas of serous fluid accumulation in the endometrial stroma. Uterus with mucometra revealed variably dilated lumen with thin wall and flat in appearance and there was an increase in the number and size of endometrial glands with increased epithelial activity. Uterus with haemorrhages revealed focal areas of haemorrhages in the endometrium or focal areas of hemosiderosis in the endometrial stroma. It was concluded that the natural occurrence of the uterine affections can adversely affect the reproductive performance in sheep and goats.

KEY WORDS : Sheep, Goats, Uterus, Hydrometra, Pyometra, Mucometra

INTRODUCTION

Although, various aspects of reproduction in different breeds of goat kept under a variety of environments in many parts of world have been studied, there is still a need to increase our knowledge on this issue, particularly when it is compared with other food animals. Such information is essential to improve reproductive performance and productivity of sheep and goats, which play an important role in food animal production under tribal system of agriculture. The abattoir study provides a useful source of information about pathological conditions of uterus affecting the reproduction. Therefore, the present investigation was carried out with the objective to conduct a histopathological study of naturally occurring pathological conditions of uterus affecting the reproduction in small ruminants.

MATERIALS AND METHODS

For the present study, a total of 267 sheep and 371 goat female genitalia were collected from local abattoirs irrespective of their age, breed or reproductive status. Whole of the genital tract of sheep and goats was collected in normal saline immediately after slaughter. It was washed with normal saline (0.9%) and transported to the laboratory in separate thermocol containers at 37°C and examined within 2 hours of slaughter. Each tract was incised along the long axis through cervix, uterine body, into the horns and processed for further histopathological studies. A detail gross morphology of uterus was noted and classified as non-pregnant, pregnant/gravid and abnormal uterus showing pathological lesions. The representative uterine tissue pieces showing gross pathological lesions were collected in 10% neutral buffered formalin and processed for histopathological studies (Luna, 1968). Individual sections were microscopically examined and the histopathological

alterations were recorded and digitally microphotographed. Histopathological study was carried out in Disease Investigation Laboratory, IVRI Regional Station, Palampur.

RESULTS AND DISCUSSION

Out of total sheep genitalia (267) examined, 40 (14.98%) had one or more genital abnormalities. Examination of 371 goat genitalia revealed that 92 (24.80%) had genital abnormalities. Out of the total sheep and goat genitalia examined, 19 (7.11%) and 30 (8.08%), respectively, had uterine abnormalities. Pregnancy was recorded in 11.59 per cent of the abattoir goat genitalia and 7.86 per cent of ewe genitalia.

Among the acquired reproductive abnormalities, different uterine pathologies also have been recorded earlier in ewes and goats. Alosta *et al.* (1998) reported that overall 9.4 per cent of the tracts showed evidence of pathological changes. Abeyratne and Atureliya (1982) reported an incidence of 11.4 per cent of pathological conditions and malformations in indigenous female goats of Srilanka. Dawood (2010) recorded prevalence of macroscopically diagnosed pathological abnormalities in 25.7 per cent of the ewes. Long (1980) examined 276 reproductive tracts of ewes and found the incidence of pathological conditions as 8.7 per cent.

Gravid and Non-Gravid Uterus: Histologically, the uterus of non-pregnant animals (sheep and goats) revealed normal architecture comprising uniform layer of surface epithelium, dense endometrial stroma and well distributed endometrial glands. However, gravid/pregnant uterus revealed an increase in the size and number of endometrial glands, sparse stromal cell population and the increased cellularity of the surface epithelium (Fig. 1).

MICROPHOTOGRAPHS OF PATHOLOGICAL CONDITIONS OF UTERUS

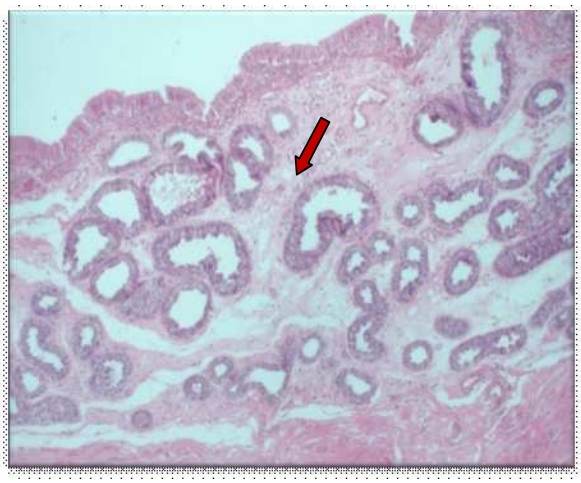


Fig. 1: Photomicrograph of the uterus of pregnant animal (H&E x 66)

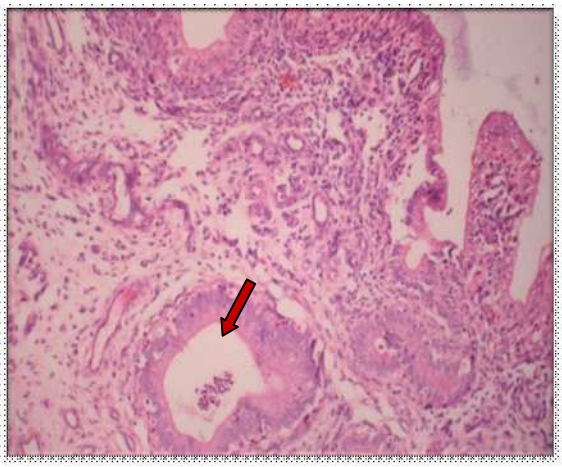


Fig. 2: Photomicrograph of the uterus of acute pyometra showing dilated and hyperplastic endothelial glands filled with pus (H&E x 66)

Pyometra: Pyometra was identified in 1.34 per cent specimens of goats and 1.88 per cent of ewes. The uterus showing gross pathological lesion of pyometra revealed dilated and hyperplastic endothelial glands variably filled with purulent exudation. In acute cases, the predominant cell was neutrophils in the stroma as well as in the lumen of the endometrial glands (Fig. 2). However, in case of sub-acute to chronic pyometra cases the surface epithelium of the uterus was variably hyperplastic or hypertrophied in nature and a large number of lymphocytes, plasma cells and occasional macrophages were present and the areas of infiltrated inflammatory cells were noted

frequently in the endometrial stroma. Acyclicity, inflammation and infertility are consequences of pyometra which can be a sequelae to postpartum endometritis (Morrow, 1986). Persistency of a functional corpus luteum precipitates occurrence of pyometra by increasing uterine susceptibility to infection, inducing mucus plug formation and inhibition of myometrial contraction. This is mediated by progesterone secreted by the corpus luteum (Kennedy and Miller 1993).

Hydrometra: Hydrometra was characterized with accumulation of aseptic fluid in the uterine lumen and presence of persistent corpus luteum in the ovaries of goats (Pieterse and Taverne 1986). Hydrometra was evident in 3.5 per cent of genitalia involving either both the horns (76.92%) or right (15.38%) or left (7.69%) horn of goat uterus. It was diagnosed in 2.99 per cent specimens of ewes. A clear watery fluid was accumulated either unilaterally in three (one in left and two in right uterine horns) or bilaterally in five ewe genitalia. The uterus showing gross pathological lesion of hydrometra revealed variably dilated lumen with thin wall and flat in appearance and the variable sized areas of serous fluid accumulated in the endometrial stroma, which was comparatively reduced in size. The endometrium was comparatively thin and flat in appearance with lesser number and size of endometrial glands due to variable pressure atrophy caused by the fluid accumulation in the uterine lumen (Fig. 3).

Mucometra: Mucometra is a condition where mucus of variable consistency and amount collects in the uterus. The cause is congenital or acquired obstruction of the outflow of mucus initially produced in normal amount. However, it can be due to the production of excessive amounts of mucus in cases of hyperestrogenism (Kennedy and Miller, 1993). Mucometra was evidenced in 1.07 per cent of specimens of goat while mucometra was recorded in 1.49 per cent of ewes. The uterus showing gross pathological lesion of mucometra revealed variably dilated lumen with thin wall and flat in appearance and there was an increase in the number and size of endometrial glands with increased epithelial activity. Excessive mucin or mucinous substances were present within and in-between the stromal cell population of the endometrium (Fig. 4). The luminal epithelial cells were comparatively taller, columnar, hypertrophied with vacuolated cytoplasm.

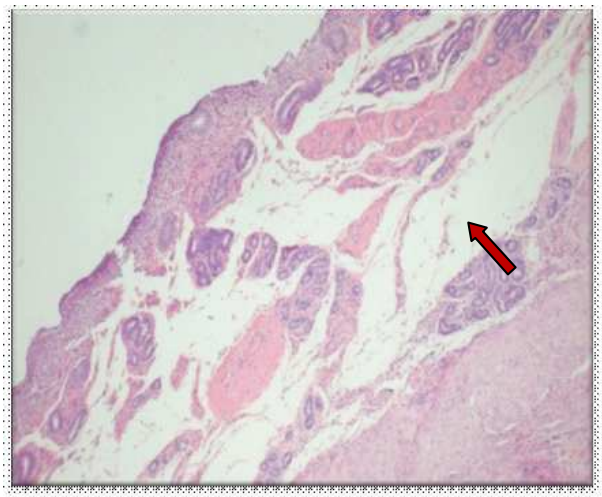
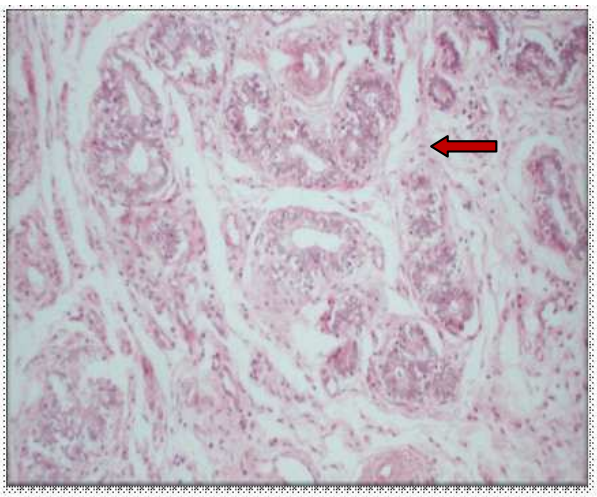


Fig. 3: Photomicrograph of hydrometra showing clear white areas of serous fluid accumulated in the endometrium (H&E x 66)



Fig, 4: Photomicrograph of mucometra showing increased glandular epithelial activity and presence of mucinous substance (H&E x 132)

Endometrial haemosiderosis/haemorrhages: Excessive haemorrhage in uterine horns was evidenced in 0.8 per cent of goats; in one case it was bilateral while in the other two either right or left horn was affected. The uterus showing gross pathological lesion of haemorrhages revealed focal areas of haemorrhages in the endometrium. The presence of focal areas of variable amount of granular, golden brown colour pigment in the endometrium due to earlier or old haemorrhages was also frequent in these cases. The pigment was present as cluster either extracellularly or intracellularly as evident by the presence of haemosiderin laden macrophages in the endometrial stroma.

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