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Occurrence and pathology of sarcocystosis in heart of goat

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Abstract

In the present investigation total number of 639 specimens of cardiovascular system of goats were examined out of which 48 cases were recorded and found the sarcocystosis. Grossly, there no evidence of sarcocysts in heart muscles. Mostly these are small round, oval and elongated shape. The section of 4-6 micron thickness were cut and stained with routine staining methods by hematoxylin and eosin, results were recorded by gross observations and microscopic lesions. In the processing microscopically, multiple of round or oval shape sarcocysts were found between separated myocardium muscles of the heart. In some cases cysts were found ruptured and their bradizoites were scattered in between the myocardial cells and some sections multiple sarcocyst with degenerated cardiac muscles. Another microphotograph showed elongated multiple sarcocyst in cardiac muscles along with haemorrhages.

Keywords: Sarcocyst, heart, histopathology, goat, sarcocystosis

Introduction

Goat is the poor man's cow, (MacHugh and Bradley 2001), because goat rearing has been recommended as the best choice for rural people in developing countries due to wider adaptability, low investment, high fertility and fecundity, low feed and management needs, high feed conversion efficiency, quick pay off and low risk involved. Being small-sized animal the goats can easily be managed by women and children. Goat milk and meat also contribute to human nutrition (Casey 1992). Heart is one of the important part of cardiovascular system its comprises heart, arteries, veins, lymphatic channels. In the cardiovascular system heart is a muscular pump that sends oxygenated, nutrient-rich arterial blood throughout the body via systemic circulation. It also helps in distribution of respiratory gases such as oxygen and carbon-dioxide apart from those hormones excretory products. The heart is enclosed in the fibro-serous pericardial sac, and cardiac wall mainly consist of three layers epicardium, myocardium, endocardium. Cardiovascular system also maintains body temperature and pH and homeostasis. Sarcocystosis is one of the pathological finding in goat heart it was recorded 32.43 per cent cases.

Collection of Samples

Source and collection of samples

For the proposed investigation, samples of cardiovascular system of goats (*Capra hircus*) irrespective of age, sex and breed were collected from slaughter houses of Bikaner, Nagaur, Jodhpur and adjoining areas of these districts. The tissue specimens were also collected from the carcasses of goats submitted to the department of Veterinary Pathology, College of Veterinary and Animal Sciences, Bikaner for post mortem examination. The samples received from the field veterinarians at the department of Veterinary Pathology were also included in this study. During post-mortem examination, the samples were thoroughly examined grossly for alteration in morphology in terms of shape, size, color, consistency, location and presence of cysts and abscesses *etc.* lesions in individual parts of cardiovascular system. During present investigation 639 specimens of cardiovascular system of goats were examined and 148 specimens of heart, blood vessels and lymph nodes showing gross lesions were collected for further histopathological examination.

Processing of tissues

Following collection all the samples were properly preserved in 10 percent formalin. The part

of affected tissues measured 2-5 mm thickness and presenting the lesions with normal tissue, were used for fixation and further histopathological examination. For histopathological examination, processing of tissues was done by paraffin embedding using acetone and benzene technique (Lille, 1965). The section of 4-6 micron thickness were cut and stained with routine staining methods by hematoxylin and eosin. Results were recorded by gross observations and microphotographs.

Staining of tissue section

The heart tissue sections were using haematoxylin and eosin method for histopathological evaluation (Luna G 1960)^[10], (Bancroft JD, Suvana, SK, Layton C. Bancroft s 2013)^[8]. Following deparaffinization the sections were dehydrated using serial changes in ethanol and stained using Harris haematoxylin. After differentiation and follow up staining with Eosin, the slides were dehydrated and then permanently mounted using DPX as far as possible, results recorded by microscopic examination.

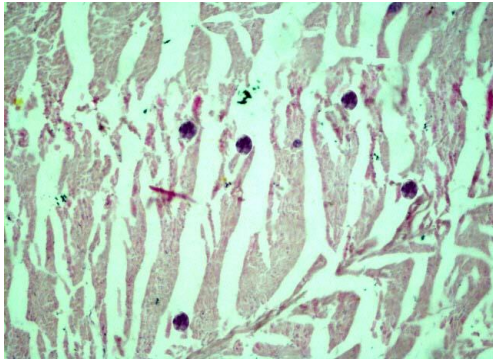


Fig 1: Microphotograph showing multiple sarcocyst between the myocardium muscles. H&E 100X.

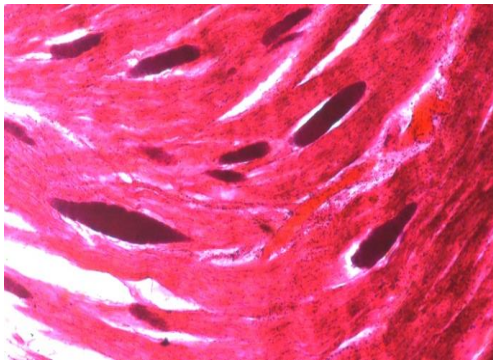


Fig 2: Microphotograph showing multiple elongated sarcocyst along with haemorrhage. H&E 100X.

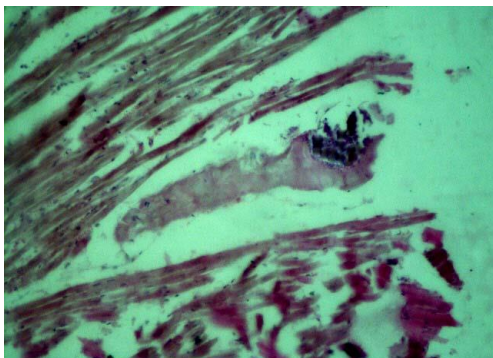


Fig 3: Microphotograph showing ruptured sarcocyst in cardiac muscles. H&E 200X.

Result and Discussion

In present study only sarcosporidiosis was observed in the cardiac muscles as *sarcocystis* are most commonly affect the musculature of the animals including cardiac muscles in domestic ruminants. In the present study this condition was recorded in 32.43 per cent cases. Higher incidence recorded by Goswami (2019) 37.83 per cent. The microscopic findings such as multiple, round, oval and elongated shape sarcocysts were found between separated myocardium muscles of the heart, some of the cysts were found ruptured and their bradizoites were found scattered in between the myocardial and these findings resembled to that of earlier report Goswami (2019), Dong *et al.*, (2018)^[3] Morsy *et al.*, (2011)^[6]. *Sarcocystis capracanis* is often found in muscles of naturally infected goats Aryeetey *et al.*, (1980)^[1], and the life cycle of sarcocyst alternate between herbivores and carnivores Uggla and Buxton (1990)^[7]. In the present study sarcocystosis occurs due to contamination through the faeces of carnivores.

Conclusion

The study considering the severity of sarcocystosis in the vital organ i.e., heart and it can be concluded that this condition is serious pathological malady in domestic animals resulting in economic loss of the rural farmers.

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