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MACROSCOPIC AND MICROSCOPIC STUDIES ON SARCOCYSTIS INFECTION IN BUFFALOES - PUBLIC HEALTH ALERT

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ABSTRACT

Sarcocystosis is one of the important zoonotic parasitic diseases and commonly reported in buffaloes, cattle and pigs. Meat and meat products are the main sources of infection in human beings. The present study aimed to record the prevalence of Sarcocystosis in buffaloes during the time of slaughter. Out of 61 buffaloes slaughter for meat purpose, 38 showed the presence of macroscopic sarcocysts in different organs and they were in creamy colour lying parallel in between the muscle bundles. Distribution of the sarcocysts was noticed in the muscles of oesophagus, diaphragm, heart and base of the tongue. Microscopic examination of the stained impression smears collected from the mixed meat which is ready for sale from the 61 buffaloes, 52 were found positive for microscopic bradyzoites. In conclusion, Sarcocystis is more prevalent in buffaloes and diagnosis of the disease can be done by microscopic examination of the stained slide impression smears from the suspected meat along with the macroscopic examination of the muscles.

Contribution/Originality: This study is one of the very few studies which have investigated the diagnosis of zoonotic disease in veterinary sciences. This study contributes in the existing literature on diagnosis of the Sarcocystosis in the mixed meat which is readily available for sale to the public and caution as a public health alert.

1. INTRODUCTION

Most of the parasites in livestock reduce the body growth and economy for the farmers. Sarcocystis is a cyst forming coccidian parasite and it requires two hosts i.e. carnivores which will act as definitive host; herbivores and humans act as intermediate host. It is transmitted by the ingestion of the bradyzoites contaminated and undercooked meat and by accidental ingestion of the oocysts excreted by definitive hosts. During the disease process chronic pyrexia, emaciation, neurological signs, debility and death are noticed [1]. However, most of the animals infected with Sarcocystosis appear to be normal and healthy at the time of clinical examination and found positive while conducting the post-mortem. Routinely it was diagnosed by the direct visualization of the cysts, examination of the impression smears, histopathology, digestion methods and serological methods. In humans, Sarcocystosis caused by intake of the raw or undercooked beef containing the larval stages of *Sarocystis hominis* [2]. Throughout the world, different literature and information was available on Sarcocystis diagnosis during the time of slaughter and examination of the minced meat of animals [3, 4]. But literature was very limited on the examination of Sarcocystis in the impression smears collected from the meat. Hence the present study was started

to record the incidence of Sarcocystis in buffaloes during the time of slaughter and analysis of the slide impression smears collected from the mixed meat which is ready for sale for human consumption.

2. MATERIALS AND METHODS

The present study was carried out at Proddatur of YSR Kadapa district, Andhra Pradesh, India, from August 2015 to February 2016. During the study period, the slaughter of the 61 buffaloes for meat purpose was screened for Sarcocystis. At the time of slaughter visual inspection of the meat samples were carried out for the presence of macroscopic sarcocysts and their anatomical distribution. Few macro sarcocysts were isolated from the muscles, placed in separate vials for the assessment of the gross morphology. Slide impression smears were collected randomly from all the animals' meat which is ready for sale. This meat consists of muscles of the different parts of the body. Microscopic examination of the slide impression smears was done to record the incidence of Sarcocystis in mixed meat samples which are ready for sale [5].

3. RESULTS AND DISCUSSION

At the time of slaughter out of 61 buffaloes, 38 showed the presence of macroscopic sarcocysts in different organs and it was in creamy colour lying between in parallel to the muscle bundles (Fig.1). Microscopic examination of the stained impression smears collected from the mixed meat of 61 buffaloes, 52 buffaloes were found positive for microscopic bradyzoites (Fig.2). Distribution of the sarcocysts was noticed in the muscles of oesophagus, diaphragm, heart and base of the tongue.

Sarcocystis is one of the obligatory intercellular parasites in mammals. Most of the large ruminants show the subclinical infection and presence of macro or micro cyst formation in the muscles [6]. In bovines, it causes the huge reduction in the production by reducing the body eight, low feed conversion ratio, abnormal clinical changes, susceptibility for other disease conditions and death [3]. In humans, it is caused by consumption raw and undercooked meat which containing bradyzoites of Sarcocystis. Li, et al. [7] was recorded the clinical disease in humans with clinical diseases abdominal distension, watery diarrhoea, vomiting, chilling and fever, dizziness, pain and anorexia [7]. Clinical disease in humans was noticed by the ingestion of oocysts from the dogs and after 10 days and 12 days of post-infection, sporocysts forms were detected in faeces of humans [2].

Muscle wise prevalence of infection was also reported and it is high in the tongue, oesophagus and cardiac muscles and the study findings were in association with the previous literature [1, 8]. Most of the buffaloes in the present study were used to go for grazing over the open areas where more population of pet dogs is there and buffaloes used to intake the water and feed contaminated with the sporocysts voided by the infected dogs. Voided sporocysts are in huge in number and they can survive in the external environment for several months which results in higher prevalence of infection. It is very essential to educate the public about the zoonotic aspect of this disease and its transmission. It had zoonotic significance, it is essential to formulate the appropriate control strategy.

4. CONCLUSION

The results of the present study indicated a high incidence of *Sarcocystis* spp. infection in buffaloes. It is recommended that microscopic examination of slide impression smears collected from the meat is essential to diagnose the Sarcocystosis for screening of the disease.

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Fig-1. Recovered macroscopic sarcocysts from the diaphragm
Source: Figure was constituted from the inspection of meat of current study

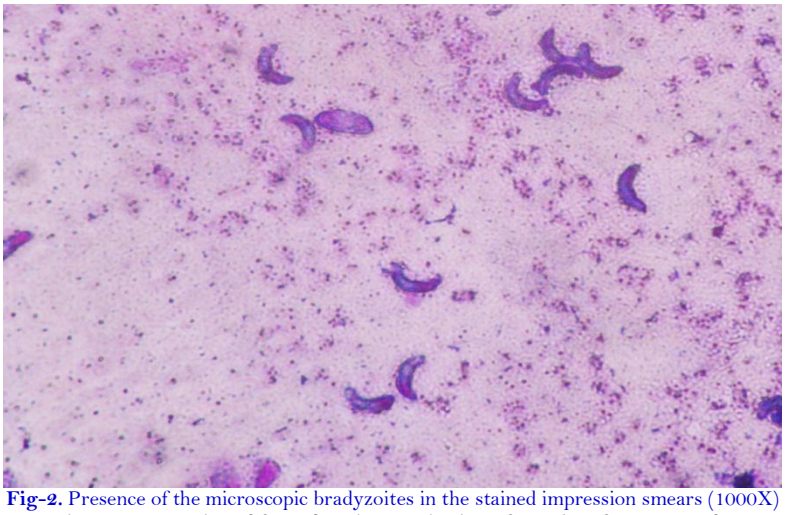

Fig-2. Presence of the microscopic bradyzoites in the stained impression smears (1000X)
Source: Figure was constituted from the microscopic view of samples of current study