

Assessment Of *Sarcocystis fusiformis*, Whole Cyst Extract Antigen From Buffaloes In Diagnosis Of Cattle Sarcocystosis

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ABSTRACT

In this study, the whole extract antigen of *Sarcocystis fusiformis* from buffaloes was assessed for diagnosis of cattle sarcocystosis using ELISA. Prevalence rate of *Sarcocystis species* among cattle using microscopical examination was 87.69% while the prevalence rate was 92.31 % by using ELISA. The sensitivity and specificity of ELISA in diagnosis the infection in cattle were 93.33% and 80%, respectively. Due to the presence of hidden or microscopic cysts, we strongly recommend the use of combined microscopical examination and ELISA test for *Sarcocystis* diagnosis, to avoid human infection of such zoonotic parasite and to control the consequent disease. This study concluded that the use of whole cystic crude antigen of *S. fusiformis* derived from buffaloes is a reliable mean for diagnosing cattle sarcocystosis.

INTRODUCTION

There are three species of *Sarcocystis* in cattle: *Sarcocystis cruzi*, *Sarcocystis hirsute* and *Sarcocystis hominis*. *Sarcocystis cruzi* is the most common one, while *Sarcocystis hominis* has a significant impact on public health. Meat and meat products are the main source of infection in human beings who become infected when ingesting well-developed tissue cysts containing bradyzoites (1).

The clinical signs of infected cattle with *Sarcocystis* include fever, anorexia, anaemia, diarrhea, cachexia, weight loss, accelerated heart rate, abortion, myositis and neurological signs. Moreover, acute sarcocystosis can be fatal (2).

Diagnosis of *Sarcocystis species* infection in domestic animals is very difficult where the clinical signs observed on infected animals are non-specific. At the same time, detection of either macroscopic or microscopic cysts in skeletal and oesophageal musculature by

histological or digestion techniques is not a valid procedure for diagnosing in alive animals. So, several studies have been performed to diagnose *Sarcocystis species* infection by detection of antibodies directed against this parasite such as enzyme-linked immunosorbent assay (ELISA) (3,4).

Since *Sarcocystis species* of cattle were proved to infect buffaloes

(5) and the macroscopic *S. fusiformis* of buffaloes produce large amount of antigen that can't easily available from microscopic cysts of cattle, *S. fusiformis* antigen was assessed in this study for diagnosing cattle sarcocystosis.

Table 4. Sensitivity and specificity of ELISA using *Sarcocystis fusiformis* antigen for diagnosis of cattle sarcocystosis.

Animal	Examined No.	True +ve	True -ve	Sensitivity	Specificity
Cattle	65	56	4	93.33%	80%

DISCUSSION

In the present study, diagnosis of cattle sarcocystosis by ELISA using whole cyst antigen of *S. fusiformis* of buffaloes was assessed. Using microscopical examination, the prevalence of *Sarcocystis species* of cattle was 87.69%; while using serological diagnosis (ELISA), the prevalence rate was 92.31%. *Sarcocystis fusiformis* was used in the present work as a source of antigen to diagnose the *Sarcocystis* infection in cattle by ELISA. (9,10) used *S. fusiformis* antigen in ELISA diagnosis of sarcocystosis in humans. Also (11,12) used the same antigen in ELISA for diagnosis of *Sarcocystis* infection in cattle.

The present study indicated a high prevalence 87.69% and 92.31% of *Sarcocystis species* infection among slaughtered cattle at Zagazig abattoir using microscopic examination and ELISA, respectively. This suggests that cattle were frequently exposed to infection due to their close relationship with dogs, cats, and even wild animals that act as final hosts for these protozoa. Similar results were reported in China, 79.25% (13) and 71.5% in dry zones in Sri Lanka (11). On the other hand, (14) detected low incidence rate (30%) of *Sarcocystis* infection among the examined cattle in Assiut governorate, 49.5% and 54.8% in Australia using antigens from cystozoites and merozoites, respectively (15), 56.5% in wet zones in Sri Lanka (16) and 29.6% in Egypt (17).

In the present study the sensitivity and specificity of whole cystic crude antigen of *Sarcocystis fusiformis* for diagnosis of cattle *Sarcocystis species* were 93.33% and 80%, respectively. These results were relatively agreed with that of (16) who found that cystozoite crude antigen of *Sarcocystis*

fusiformis had 100% sensitivity and specificity for diagnosis of cattle sarcocystosis, (13) said that the sensitivity was 99% using soluble cystozoite antigen of *Sarcocystis fusiformis*, however the specificity was 91% and (15) who recorded that sensitivity and specificity of antigens derived from merozoites and cystozoites of *Sarcocystis fusiformis* were 68%, 97%, 95% and 84%, respectively.

In conclusion, the results presented here suggest that whole cystic crude antigen of *Sarcocystis fusiformis* derived from water buffaloes is accurate in discriminating between cattle infected and non infected with *Sarcocystis species* and may be used in diagnosis of acute infection of sarcocystosis in livestock animals. Finally, it is strongly recommended to use both microscopical examination at postmortem and serological examination (ELISA) for routine examination of sarcocystosis in Egypt.

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الملخص العربى

تقييم استخدام مولد الضد من المستخلص الكلى لحويصلات ساركوسيستس فيوزيفورميز من الجاموس فى تشخيص ساركوسيستس الأبقار

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لقد أجريت هذه الدراسة لتقييم المستخلص الكلى لحويصلات ساركوسيستس فيوزيفورميز التى تصيب الجاموس فى تشخيص حويصلات الساركوسيستس فى الأبقار باستخدام اختبار التحليل المناعى الإنزيمى المترابط (الإليزا).

لهذا الغرض تم تجميع 65 عينة من دم و عضلات المرئ الخاصة بالأبقار التى تبلغ اعمارها من 2-3 سنوات لتشخيص الساركوسيستس وقد وجد أن نسبة الإصابة بالفحص المجهرى كانت 87,69% بينما كانت نسبة الإصابة باستخدام الإليزا 92,31%.

وقد وجد أن نسبة الحساسية ونسبة التخصصية لإختبار الإليزا باستخدام مولد الضد من ساركوسيستس فيوزيفورميز المعزولة من الجاموس فى تشخيص ساركوسيستس الأبقار كانت 93,3% و 80% على الترتيب.

نظرا لصعوبة تحضير مولد الضد من الساركوسيستس التى تصيب الأبقار تستخلص الدراسة أن استخدام مولد الضد لساركوسيستس فيوزيفورميز من الجاموس باستخدام إختبار الإليزا يمكن الإعتماد عليها فى تشخيص إصابة الأبقار بطفيل الساركوسيستس.