



Original Article

Frequency of Hydatid Cyst among Sheep Slaughtered at Alkadarw Slaughterhouse

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ABSTRACT

This work has been conducted at Alkadarw abattoir and slaughter house to identify the frequency of cystic echinococcus (CE) among slaughtered animals, a total of five hundred of collected sheep were clinically examined and inspected for the evidence of presence of CE. Animals inspected were imported from three main districts; Kordufan, Butana, and White Nile. Macroscopic and microscopic were done. All inspected animals were sheep. CE was not detected in the study population this evident may be that the efforts of animal health authorities had eventually ended with such elimination of the parasite especially among animals for export. The comparison indicates that there is a significant decrease in the prevalence of CE down to zero per cent as found in this study.

Key Words: Echinococcosis, hydatid, Tapeworm.

INTRODUCTION

Echinococcosis (hydatid disease or echinococcal disease), is a parasitic disease caused by different species of the tapeworm of genus *Echinococcus* that affects wide range of mammals such as sheep, dogs, rodents, camels, horses, and even human. The parasite is found as a larval stage in herbivore and ruminant animals which represent the intermediate host, and the adult stage is usually found in the definitive hosts (dogs and other canines) (Berger *et al.*, 2006). The seriousness of the health hazard represented by hydatidosis has been reviewed frequently; the appearance of the disease, within recent years, in countries previously free of it has produced an entirely new global situation (Kemp *et al.* 2001).

Studies at 1990's have shown that in central Europe *E. multilocularis* occurs and endemic in Belgium, Luxembourg, France, Switzerland, Liechtenstein, Austria, Germany, Poland, and the Czech Republic. The prevalence rates of *E. multilocularis* in foxes are alarmingly high in some areas with average rates more than 40%. Infection rates in dogs and cats are much lower. The mean annual incidence rates of alveolar echinococcosis in humans are low varying between 0.02 and 1.4 cases per 100,000 inhabitants in several European countries and regions (Eckert, 1997).

Fourteen cases have been surgically treated in the Universities Hospitals of Cairo and Ain Shams in the period from 1995 to 2000 (Haridy *et al.*, 2000). The highly infected site was the liver and the least was the spleen. On the other hand, a total of 2,871,510 sheep slaughtered in the governmental abattoirs over five years (1995-1999) showed an overall hydatidosis of 0.33%. The highly infected site was the lung followed by the liver. However, sheep play the important role in dissemination of the disease. This is due to the fact that their cysts are the highly fertile ones as compared to other animal intermediate hosts. So, the risk cycle in hydatidosis is sheep-dog-man (Haridy *et al.*, 2000).

Ernest *et al.* (2009) study showed that, the overall prevalence of hydatidosis to be 47.9% and species prevalence of 48.7%, 34.7% and 63.8% in cattle, goats and sheep respectively in Tanzania

In a study conducted by Ibrahim (2010) reported that in Saudi Arabia in Al Baha region, during four seasons from June 2008 to May 2009 the prevalence of infection was 32.85%, 8.28%, 12.61% and 6.56% in camels, cattle, sheep and goats respectively. The prevalence of the parasite varied significantly in relation to site, season and host age classes and sex in most host species. Spring showed the highest prevalence in camels, cattle and sheep. The most commonly infected organs were liver and lungs which constituted 48.75% and 32.83% respectively, of the total infected organs. There was a significant difference among host species in fertile cysts ($P < 0.001$) (Ibrahim 2010).

In study conducted in Iran in February 2011, of 4564 livestock studied 245 (5.4%) were infected by *Echinococcus granulosus*, among them, 2.7% were sheep, 8.6% were cattle, and 12.9% were water buffalos. The highest frequency of cysts was pulmonary type of hydatid cyst. About 38% of cysts were fertile and the other 62% were infertile. The fertility rates of hydatid cyst in sheep, was 37% for liver and 26% for lung; in water buffalo, it was 46% for liver and 44% for lung; and in cattle, it was 43% for liver and 39% for lung infection (Tappe *et al.*, 2011).

The general objective of this study is to identify the frequency of hydatid cyst among sheep slaughtered at Alkadaw slaughterhouse. Also this work aimed mainly to contribute in the assessment of animal as well as human health from the prospective of the quality assurance for the already performed health measures.

Information was collected on cystic echinococcosis in livestock (camels, cattle and sheep) and humans in the central region of Sudan by Elmahdi and co-workers. The livestock data were collected in abattoir-based surveys in the towns of Omdurman, Tamboul and Wad Madani, between 1998 and 2001, and covered a total of 8205 gv animals. The highest prevalence of infection was found in the camels (44.6% of 242 infected), followed by the sheep (6.9% of 5595) and cattle (3.0% of 2368) (Elmahdi *et al.*, 2004)

The above mentioned worked was followed by a survey of cystic echinococcosis in livestock conducted from May 2001 to July 2003 in central, western and southern Sudan by Omer *et al.* (2010). They found that hydatid cysts were present in 59% (466/779) of camels, 6% (299/4893) of cattle, 11% (1180/10,422) of sheep and 2% (106/5565) of goats, with little variation among different geographical areas. Genotype was also performed in this study, and this was the first genetic characterization of human CE in Sudan. This study confirms the predominance of the 'camel strain' in Sudan and the infectivity of this strain for humans (Omer *et al.*, 2010)

MATERIALS AND METHODS

Study type and design

This is a cross-sectional abattoir based study, of a qualitative approach. In this study, sheep slaughtered at Alkadaw slaughterhouse from July 2011 to October 2011 were examined to identify the frequency of hydatid cyst.

Study area and population

This study was conducted at Alkadaw slaughterhouse, Khartoum North. This location is the biggest and the oldest slaughterhouse in the Sudan, where animals are prepared for exportation –life or processed. The facility is well equipped with suitable and appropriate technology for its function. Furthermore, the facility is occupied by well trained and experienced medical, technical, and managerial staff.

Animals are imported from different part of the country mainly North Kordofan, White Nile, and Butana plains. Study population were sheep slaughtered at the facility. 500 sheep autumn were the subject of this study. Selection of animals followed the selection criteria for slaughtering.

Study population

In this study, 500 sheep slaughtered at Alkadaw slaughterhouse were examined. Among them, 195 animal (39%) were originated from North Kordofan, 150 (30%) from White Nile and the Gazeera, and 155 (31%) were form Butana plain, distribution of animals is illustrated in figure (4-1).

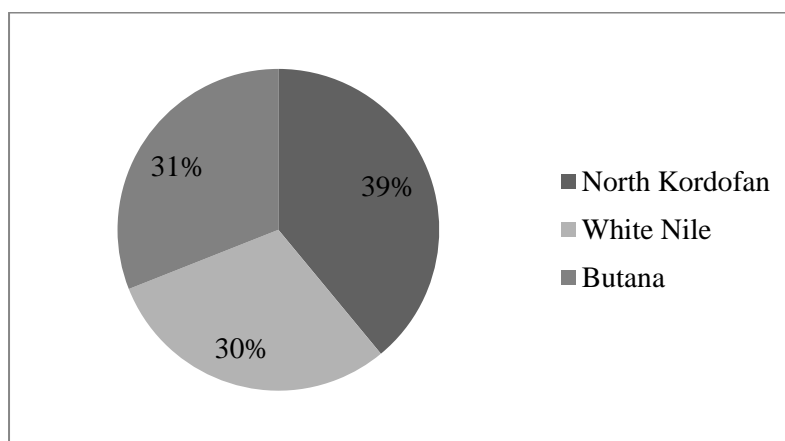


Figure 1. Distribution of sheep according to the area of origin

Study variables

This study investigated the following variables:

- Presence of hydatid cyst by naked eye inspection
- Sterility of the cyst by microscopic examination of cyst fluid
- Anatomical location of the cyst
- Classification of animals according to their original source
- Comparison with previous studies

MATERIALS AND METHODS

Data were collected through the followings:

- Macroscopic inspection and examination of slaughtered subject
- Microscopic examination of cyst fluid

- Information demographic and clinical information collected via study questionnaire

Macroscopic examination

Slaughtered subjects were macroscopically examined by the investigator with the aid of an expert veterinarian.

Hydatid cyst will be identified by its classical appearance:

- Fluid filled mass
- Variable in size
- Whitish creamy colour
- Fibrous thick shiny wall

Slaughtered animal will be thoroughly examined including liver, lung, brain, and elsewhere.

Microscopic examination

Cyst, if present, will be prepared for microscopic examination. First it will be injected with 10% formal saline for fixation and killing of protoscolices if present. Then cyst fluid will be withdraw and then transferred to microscopic slide, then examined under the microscope for the presence of protoscolices evidence.

Statistical analysis

Collected data was tabulated in the master sheet, and then transferred to electronic form using the Statistical package for social sciences software (SPSS). Correlation and analysis and descriptive analysis were performed.

RESULTS AND DISCUSSION

Frequency of EC among study population

Hydatid cyst was not detected among the study population. Unpublished reports form Alkadaw abattoir during mid 1980's recorded case of about 2% frequency.

Table 1 and Figure 2 compare between three different studies and the present study in the prevalence of CE in Sudan. The comparison indicates that there is a significant decrease in the prevalence of CE down to zero per cent as found in this study.

Table 1. Comparison between 3 different studies of prevalence of Echinococcus hydatid cyst in sheep in different years and the present study

Year	1986	2001	2003	2011
Percentage	12.9 %	6.9%	11%	0%
Reference	(Ahmed 1985).	(Elmahdi <i>et. al.</i> , 2004)	(Omer <i>et. al.</i> , 2010)	Present study

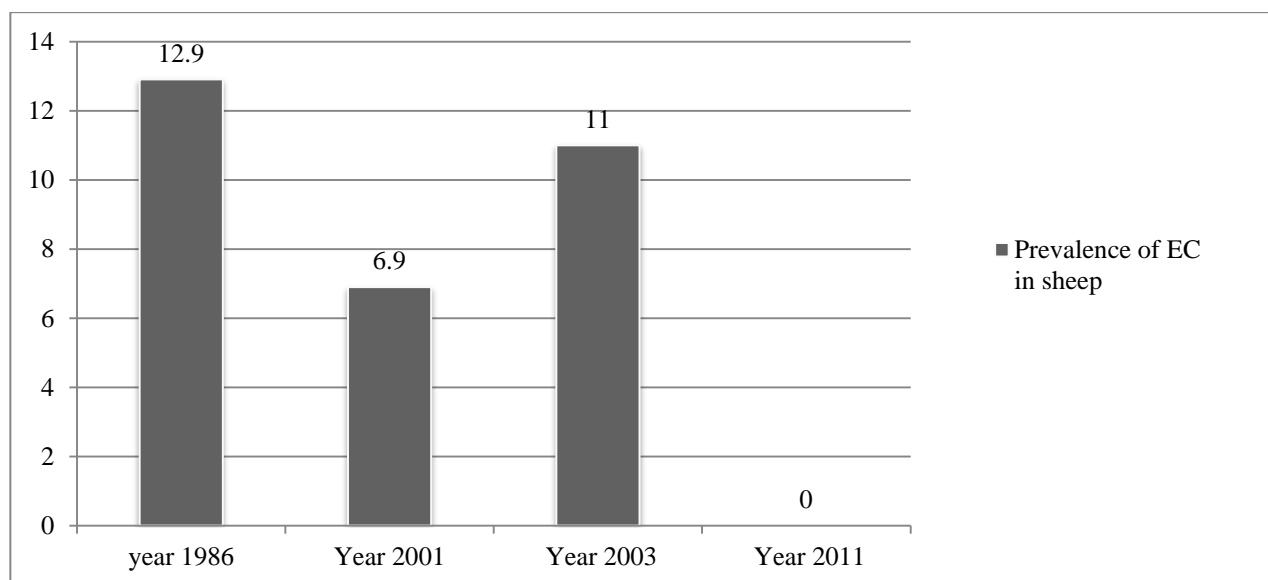


Figure 2. Comparison between 3 different studies of prevalence of Echinococcus hydatid cyst in sheep in different years and the present study

The objective of the present study is to identify the frequency of CE among slaughtered animals at Elkadarwabattoir. The ultimate aim however, is to assess the efficacy of clinical monitoring as well as the field inspection. This result is differ from the findings of ((Haridy *et. al.*, 2000, Eckert, 1997, Ernest *et. al.*, 2009, Ibrahim, 2010, and Tappe *et. al.*, 2011) who studied the prevalence of cyst of eccinococcus in Egypt, Europe, Tanzania, Suadia Arabia, and Iran respectively. On the other hand this study gave an indication about the grazing environment. As indicated previously, the prevalence of CE decreased to the minimum levels. This observation may be attributed to many different factors. Changing of grazing field environment is one of the important factors. They have been shifted from

wild rural and open yards, to an environment free of wild living associates. Moreover, it is evident that the efforts of animal health authorities had eventually ended with such elimination of the parasite especially among animals for export.

The systems of inspection ensure that health animals will be properly selected. Hence, the chance of finding infected animal after slaughtering is tends to be rare. Similar study should be done in other facilities especially those dealing with cattle and camels and the results like it. At the end of this study I recommend that:

- A) Health education for productions, transporters and all slaughters workers.
- B) Motivation and dissemination of animals production and food hygiene.

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