



The Prevalence of Liver Flukes in Slaughtered Camels (*Camelus dromedarius*) of Different Iraqi Governorates

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Abstract

A retrospective study covered the period of 10 years (2006-2015) to investigate the prevalence of liver flukes in camels reared in different governorates of Iraq. A total of (7972) slaughtered camels were inspected macroscopically for liver flukes' infestation, out of which (118) slaughtered camels (1.48%) were infected with liver flukes. The prevalence of this parasitic disease varied according to the governorate and the year of study, but in general, Dhi Qar governorate recorded the highest prevalence among the other governorates mainly in 2010 and 2013 which revealed (3.1% and 2.5% respectively), followed by Al Muthanna governorate (2.3%) in 2008. This could be due in part to the areas associated with marshes and wetlands in the Dhi Qar governorate which are leading to an increase in the capacity of the snails as intermediate hosts to reproduce rapidly providing the opportunity to spread the infective stage of liver flukes and pollute the grass. The current results provide baseline data for the prevalence of this parasitic disease in camels of different Iraqi governorates, which supply the opportunity for future monitoring and evaluation leading to control programs of liver flukes in Iraq.

Keywords: Camel, liver fluke, Abattoir, prevalence, Iraq

Introduction

Camels are considered an important source of milk and meat production in many regions of the world, mainly in Asia. These livestock species play an essential role in Arabian community traditions and people's economic activities (1). With about 35 million worldwide distributions of population, the one-humped camel (*Camelus dromedarius*) occupies 95% of the whole population of African and Asian camels (2). The estimated camel population in Iraq is about 58000, the majority of them bred in the area extending from the Euphrates to the western frontier (3). Camels are susceptible

to infection with different kinds of parasites among them Fascioliasis (liver flukes) which is a food and water-borne disease, that infects many grazing animals even camels and men. This parasitic disease has a growing concern mainly in the public health of developing countries causing a major health problem for humans due to its adverse health effects on liver tissue of humans and animals rather than the pronounce economic losses due to a pronounced decrease in milk and meat production, rejection of affected livers, abortion, increased mortality and the expense of its control measures (4). About 3 million people have been recorded infected and the

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susceptible risk of infection threatens about 200 million people around the world (5). The disease could result from either, the migration of immature flukes through the liver, or from the presence of adult flukes in the bile ducts. Adult flukes lay eggs in the feces of infected animals causing contamination of pasture, at a suitable environment, a larval stage (miracidium) develops within the egg then hatches and migrates seeking the mud snail host (*Lymnaea*), within it the miracidium develops to infective cercariae, which emerges from the snail, migrates onto wet grass, encysting as metacercariae, which is represent the infective stage of the parasite (6). After grazing an animal on contaminated pasture, the young flukes migrate from the intestine to the liver, in which they tunnel causing liver tissue damage and resulting in a notable economic loss represented in disapprove the affected liver tissue, reduction of animal body weight, milk yield, and fertility as well as animals health condition (7; 8). Few reports about liver flukes in camels are available in the literature, it is an important problem

that deserves further attention owing to its potential impact on camel production in general and its effect on food security in Iraq.

This study aimed to clarify the prevalence of this parasitic disease in slaughtered camels that are traditionally used as sources of meat for human consumption in different Iraqi governorates. Furthermore, it could provide a database for further epidemiological studies that enhance the evaluation and update of the control programs for liver flukes in Iraq.

2. Materials and Methods

2. 1. Methods

A retrospective study covered the period of 10 years (2006-2015) and was performed to investigate the prevalence of liver flukes in camels reared in three Iraqi governorates (Al Muthanna, Al-Qadisiyah, and Dhi Qar) Fig(1). Slaughtered camels in each governorate abattoir were inspected macroscopically for liver flukes' infestation.

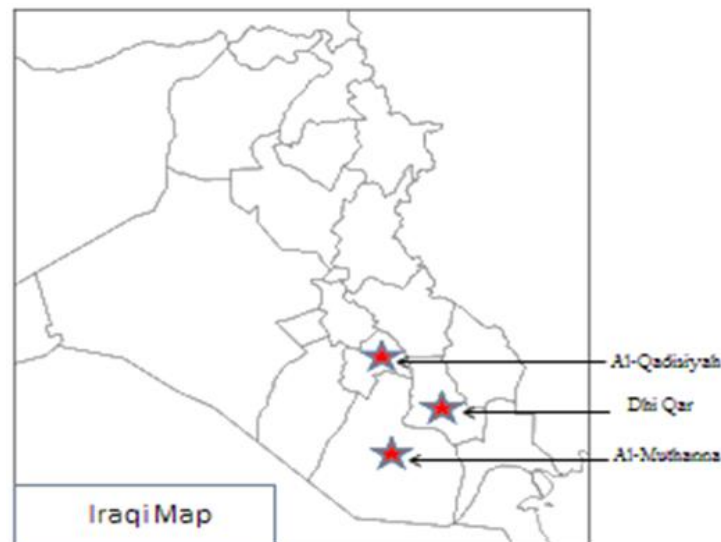


Figure 1. The map of Iraq shows the geographical locations of the three Iraqi governorates where liver flukes in camel are recorded.

2. 2. Sampling

The study was performed in slaughterhouses of three Iraqi governorates, where camels are used as a source of meat for human consumption, and it was conducted following the Ethics Committee of Veterinary Medicine College at the University of AL Muthanna, Iraq. In which a total of (7972) slaughtered camels including, (Al-Qadisiyah (2385), Al-Muthanna (2262), and Dhi Qar (3325)). In each governorate abattoir where these animals are slaughtered, the prevalence of liver fluke infestation was calculated as a number of affected animals divided by the total number of macroscopically inspected animals and multiplied by 100 per each year over ten years (from 2006 to 2015).

3. Results and discussion

Slaughterhouse information resulting from veterinarian records of postmortem meat inspection in several countries is considered of great value in the field of preventive medicine and has been used as a dependable source of data for the evaluation of epidemiological aspects for many parasitic diseases including liver flukes (9).

During the covered period of the study, the distribution of liver flukes cases among slaughtered camels in the studied governorates, as in (fig. 2) revealed that infected camels in Al Muthanna governorate recorded (28) cases out of 2262 slaughtered camel (1.23%), in Al-qadisiyah governorate recorded (30) infected cases out of (2385) slaughtered camel (1.26%), while the highest prevalence value (1.8%) showed in Dhi Qar governorate which revealed (60) infected cases out of (3325) slaughtered camel, this was obvious in 2010 and 2013 which recorded (3.1% and 2.5% respectively), followed by Al Muthanna governorate (2.3%) in 2008 (fig. 3). Although (10) revealed the predominance of liver flukes in the central and southern Iraq which coincided with our results, it could be due to the availability of wet lands and marshes in these regions particularly in areas as in Dhi Qar governorate associated with marshes and wetlands which are leading to increasing the capacity of the intermediate host (snails) to reproduce rapidly providing the opportunity to spread the infective stage of liver flukes and pollute the grass. Despite the climate of the covered governorates being hot and arid, our results recorded liver fluke infection in all studied governorates.

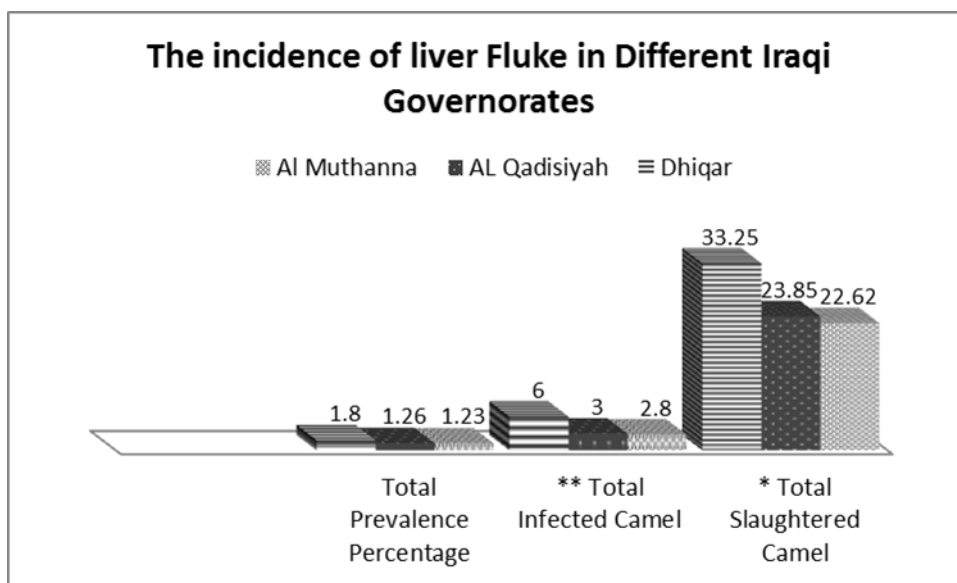


figure (2): The total slaughtered camels, total infected camels, and total prevalence of liver flukes in camels recorded in abattoirs of different Iraqi governorates
(*) Camel number x10 while (**) Camel number x100.

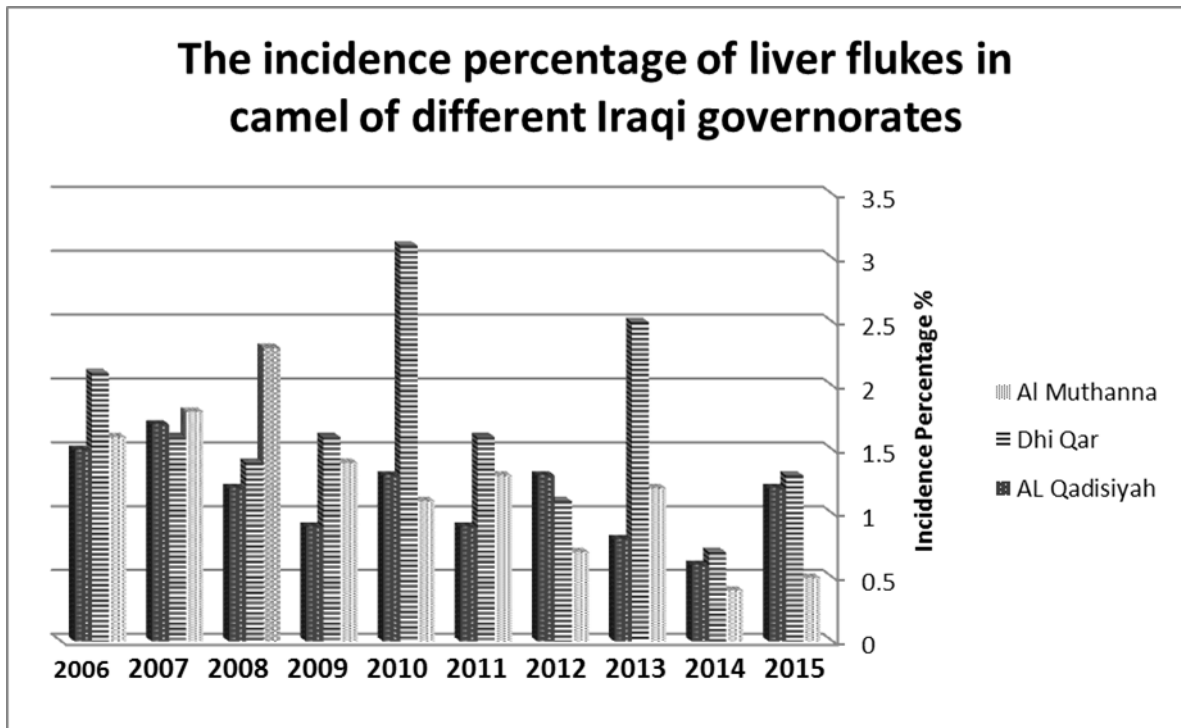


figure (3): The percentages of liver flukes in camels recorded in abattoirs of different Iraqi governorates.

Many studies conducted in different governorates showed that the prevalence of liver flukes differs from one region to another, according to environmental conditions, animal species, and raring method (11). For instance, a study conducted in Baghdad city by (12) showed the prevalence of liver flukes in sheep, buffalo, and cows was (9.1%, 13%, and 8.3%) respectively, while in Mosul governorate, recorded 13.3% (13). (14) revealed the prevalence of infected sheep in Tikrit was 17.54% from December 2017 to the end of June 2018. (15) Found the infection rate was 26.1% of post-slaughter inspected cows in Mosul city. (16) Indicated that the incidence of liver Flukes was 6.3% in sheep of Lorestan, Iran.

In Turkey, (17) showed the prevalence of the disease ranged between (0.7%–29.4%) in sheep and (0.13%–2.02%) in goats. In Basra governorate, (18) recorded the incidence percentage of liver flukes in buffaloes, cattle, sheep, and goats at (4.8%, 3.3%, 0.72%, and 0.13%) respectively. The incidence difference between this study and the previous studies could be due to the different species that were used, the raring pattern, breeding, and feeding habits of the studied animals. Although the cultural and economic value of this livestock species, it could

also make camels a growingly important source of zoonotic disease transmission to humans, especially in developing countries.

4. Conclusions

Although the studied areas shared the similarity in camel raring patterns and climate, the result variation could be due in part to the areas associated with marshes and wetlands in the Dhi Qar governorate accordingly leading to an increase in the opportunity for the intermediate host to reproduce rapidly providing the ability to spread infective stage of liver flukes and pollute the grass. The current results provide baseline data for the prevalence of this parasitic disease in camel that affects different Iraqi governorates, which supply the opportunity for future monitoring and evaluation leading to control programs of liver flukes in Iraq, especially in view of the risk factors associated with this parasitic disease.

Conflict of interests: None

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