

RESEARCH ARTICLE

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STUDIES ON *CYSTICERCUS TENUICOLLIS* COLLECTED FROM SLAUGHTERD SHEEP AND GOATS IN BASRAH ABATTOIR, IRAQ**ABSTRACT:**

This study includes isolation and identification of the larval stage *Cysticercus tenuicollis* of dog's cestoda thin neck *Taenia hydatigena* from slaughtered animals in Basrah abattoir. A total of 180 sheep and 90 goats were determined by sex and examined during six months of study from January to June 2009. The diameter of alive cysts and the amount of liquid were measured. The total amount of protein was estimated at cyst antigen, and finds 3.4 nm. In slaughtered animals cysts were found in omentum and abdominal cavity, while liver and spleen were enlarged with bleeding spots. Therefore, the distribution of dog cestode *T. hydatigena* increases the pathological effect on sheep and goats in Basrah city.

KEY WORDS:

Dog's cestoda, *Taenia hydatigena*, *Cysticercus tenuicollis*, intermediate host, peritoneitis

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ARTICLE CODE: 37.01.11**INTRODUCTION:**

The adult bladder worm *Taenia hydatigena* is a large thin cestode, measures about 75-500cm and mostly called slender thin worm (Michigan, 2009). *Taenia hydatigena* is found in the small intestine of canine and other carnivores, whereas the larval stage (*Cysticercus tenuicollis*) found in the peritoneal cavity, liver and abdominal cavity of ruminants (Michigan, 2009). On the other hand, it was recorded from lung, kidney and brain of ruminants (Sanchez, 1999). Also it was found alive or calcified in uterine tube and female reproductive system of ruminants (Smith *et al.*, 1999). *Cysticercus tenuicollis* was found attached to omentum, mesentery and liver. It was also recorded for the first time from the embryonic uterine shell of goats (Jones and Hunt, 1983).

T. hydatigena of dogs are important from both sanitary and veterinary vies due to the presence of its larval stage in peritoneal cavity of sheep, goats, cow, wild ruminants and swine with severe pathological effect to these hosts. The disease threaten the animal health especially sheep (Seddon, 1967; Lawson *et al.*, 1988). Rickard (1991) mentioned that the infection by larval stages of cestodes is considered a problem with a high economic important and would be formed dangerous common health if the resolution was not be found.

Adult *Taenia hydatigena* lives in the small intestine of dogs, wolves, jackals and foxes. The gravid segments are detached and eggs are expelled out and spread in the environment such as soil, grass, water and vegetables. Eggs transmitted to the intermediate hosts when eaten with plants or grasses. The egg hatches and the hexacanth embryo penetrate the intestinal wall and enter the blood circulation to reach finally the liver. Most of them leave the liver and enter the peritoneal cavity to grow and develop to *Cysticercus tenuicollis*. The final host becomes infected when fed on infected animal's offals. The scolex evaginates in the small intestine and attaches to mucosa, then grows to adult in 51 days postinfection (Smith *et al.*, 1999).

Pathak and Gaur (1982) stated that the cysts are round and white in color but in some cases they are yellowish and surrounded by a semi-transparent wall composed of fibrous tissue, which is creating from body host. The bladder worm fills the internal space and is recognized by slender large neck which measures 5.3 mm. The neck is connected with head which is bulging or unplugging (Jenson and Pierson, 1975).

Two different larval stages parasitize sheep and goats. The larval stages of *Taenia hydatigena* (*C. tenuicollis*) are found in peritoneal cavity and liver, while the larval stages of *Taenia ovis* are found in muscles of ruminant (Lloyd, 1998).

The infection by *C. tenuicollis* occurs between animals in different parts of the world and high prevalence of infection may cause a dangerous alarm (Jenson and Pierson, 1975). Usually the prevalence of infection was different according to animal geographical distribution and it had taken a high level in poor countries and could not be controlled in wild animals (Sanchez, 1999; Budka *et al.*, 2004).

The clinical signs in sheep and other ruminants infected with *C. tenuicollis* occur during the larval migration in the liver with different clinical signs on sick animals. Peritonitis, mostly in young animals, is observed and associated with weakness, sluggish and loss of appetite leads to loss of weight. In acute cases it is difficult to show any signs and the animal will be died. In chronic cases inflammation of peritoneal cavity with ascitis was observed (Acha and Szyfres, 2003). On the other hand, the effect of the adult worms on the final hosts was similar to that recorded by many other adult cestodes of different species (Soulsby, 1982).

Leiper (1957) recorded *C. tenuicollis* in Iraq for the first time from peritoneal cavity of sheep. The parasite was also recorded from peritoneal cavity of sheep in north Iraq (Mathur *et al.*, 1974; Al-Janabi and Roa, 1987), from slaughtered sheep in Basrah city (Al-Saqr and Gorani, 1987), from sheep, goat and cow in Erbil city (Molan and Saed, 1988), from slaughtered sheep in Mousl city and from slaughtered sheep in Diwania abattoir (Khudair, 1998; Al-Mayali, 2005).

This study was done in order to find out the epidemiological rang and distribution of the larval stages *C. tenuicollis* infection between slaughter animals in Basrah city and found out the real problem.

MATERIAL AND METHODS:

The peritoneal cavity, liver and spleen of 180 slaughtered sheep (85 females and 95 males) and 90 slaughtered goats (39 females and 51 males) from Basrah abattoir were examined for infection with *C. tenuicollis*. The

cysts were isolated and kept in nylon containers, then bringing to the laboratory for further studies. *Cysticercus tenuicollis* were examined alive and measured in diameter.

The protein contents from *C. tenuicollis* were estimated from both liquid and the wall of the cyst according to method of Harlow and Lane (1988).

RESULTS:

A high prevalence of infection with *C. tenuicollis* was demonstrated in female sheep (61.17%) than males (22.10%), while the prevalence of infection with *C. tenuicollis* in female and male goats was 25.64% and 21.65%, respectively (Table 1).

The results showed that most of the live cysts were bulged. The external cyst wall was semi-transparent, white in color, some with yellowish. The wall of the bladder was transparent, faint and contained clear water fluid. The head was bulged with a thin long neck that hanging in the cyst fluid, especially in cysts which isolated from slaughtered sheep with age more than 12 months. The fluid is clear, transparent and fills the cyst cavity.

The present results showed that the size of the cysts was different between slaughter sheep and goats, ranging between 15 and 25 cm in diameter (Figs 1-4). Also, the amount of protein in the liquid, which was isolated from sheep, showed differences reached 3.4 nm.

Table 1. Prevalence of *Cysticercus tenuicollis* among slaughtered sheep and goats in Basrah abattoir

Animal type	No of infected animals		No of Infected animals		Percentage infection %		
	♂	♀	♂	♀	♂	♀	total
sheep	95	85	21	52	22.1	61.17	40.55
goats	51	39	11	10	21.56	25.64	26.25
total	146	124	32	62	21.91	50	66.8

Note: The animals were examined during six months period from January to June, 2009.



Fig. 1. Photograph of the larval stage *Cysticercus tenuicollis* from slaughtered animals from Basrah abattoir.

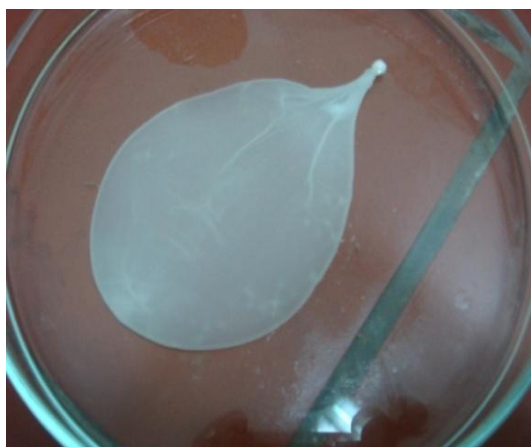


Fig. 2. Photograph of *Cysticercus tenuicollis* in laboratory with movement and amount of liquid inside it.

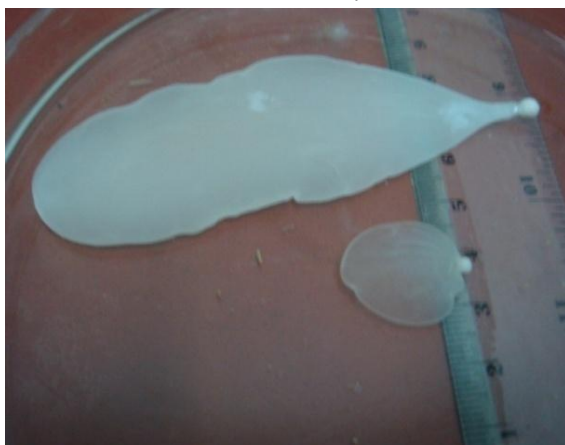


Fig. 3. Photograph of different sized isolated cysts.



Fig. 4. Photograph of cyst from liver showing scolex

DISCUSSION:

Adult *Taenia hydatigena* parasitized in the small intestine of dogs, foxes and wild carnivores, while the larval stages are found in liver, spleen and other organs of ruminants and rodents (Kara and Doganay, 2005). The parasite is not pathogenic in dogs, but the larval stages are highly pathogenic in the intermediate hosts causing harmful destruction, during their migration, in the tissues and organs (Nwosu *et al.*, 1996).

The prevalence of infection in sheep and goats was 40.55% and 26.25% respectively. This is due to accompanying of dogs with sheep and goats by owners. These animals partnered in bedding and feeding. Therefore, loss enlightenment of culture and sanitary for these owners beside isolation of these animals, cleaning of animal house and detain of sick animals and sending them to veterinary house are necessary. The owners used the UN allowance area in feeding supply of their animals such as salvage, cross road, cages, allowing their contact with stray dog's feces. Therefore, defecation of dogs near brooks and water pools, which had been supplying of sheep and goats, and also on grass and vegetables grown in farms that consider food from these animals, played important roles in transferring infection from dogs to ruminants.

The present study indicated that the prevalence of infection in slaughtered sheep and goats was 40.55% and 26.25%, respectively. These percentages were considered relatively high if compared with other previous results from Iraq. Al-Saqr and Gorani (1987) showed that the prevalence of infection in sheep with *C. tenuicollis* was 1%, while Molan and Saed, (1988) declared that the prevalence of infection in sheep, goats and cow was 35.1%, 10.4% and 9.4%, respectively. On the other hand, the prevalence of infection of sheep with *C. tenuicollis* in Mousl was 15.41% (Al-Sultan *et al.*, 1997). The infection rate of sheep and goats in Baghdad city was 14.22% and 16%, respectively (Khudair, 1998).

The infection by *C. tenuicollis* was widely spreading in Asia especially in India, Bangladesh, Iran and Jordan (Abdul-Rahman and Mia, 1975; Zeybek, 1980; Dajani and Khalaf, 1981; Karim *et al.*, 1982; Deka *et al.*, 1985; Radfar *et al.*, 2005).

The present study recorded high amount of protein in the liquid of the cyst (93.4 nm). This indicates that *C. tenuicollis* takes nourishments from this liquid. Similar results were obtained by (Nwosu *et al.*, 1996). They mentioned that the liquid of *C. tenuicollis*, which isolated from sheep, contained a high amount of protein with a molecular weight 28-116 kilodalton.

Cysticercus tenuicollis were recorded mainly in the liver. This is may be due to the presence of large amount of protein, carbohydrates and other essential elements which absorbed by the parasite, so that, *C. tenuicollis* prefer liver as organ of supplying essential elements for nourishment. Similar results were obtained by Oie (2008) which declared that *C. tenuicollis* were centralized in the liver of lamb, but Pathak and Gaur (1982) declared that *C. tenuicollis* perform mesenteric and omentum than liver of lamb and cattle.

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دراسة الطور اليرقي *Cysticercus tenuicollis* في الاغنام والمعز المذبوحة في مجزرة محافظة البصرة، العراق

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القولان شريطية الكلاب *Taenia hydatigena* تشكل خطراً على مدى واسع من المجترات والحيوانات البرية بسبب كونها مضائفة متوسطة تحمل داخلها الكيسة المذنبة و إن زيادة انتشارها والقدرة المرضية التي تحدثها ممكن ان تؤثر على الصحة العامة. وبناء على ماتقدم يمكن القول بأن انتشار شريطية الكلاب يزيد من تأثير هذا الطفيلي المرضي على الاغنام والماعز في مدينة البصرة.

تضمنت الدراسة عزل وتشخيص الطور اليرقي *Cysticercus tenuicollis* (الكيسة المذنبة) لدودة الكلاب الشريطية رفيعة العنق *Taenia hydatigena* بين الحيوانات المذبوحة في مجزرة مدينة البصرة. تم فحص (180) ذبيحة من الاغنام و(90) ذبيحة من المعز الوافدة وذلك بعد ان تم تثبيت جنس كل حيوان مفحوص خلال فترة الدراسة الممتدة ستة أشهر (كانون الثاني - حزيران 2009). فحصت الكيسات المذنبة وهي في حالة نشاطها أي (حية) وذلك بقياس قطر وحجم السائل الذي يملأ تجويفها وفحصت حركة الرأس بالعين المجردة وتحت المجهر التشريحي. قدرت كمية البروتين في سائل الكيسة المذنبة وكانت قيمته 3.4 نانوميتر. عابانيا لوحظ تركز الأكياس بالثرث والتجويف البطني، فضلاً عن ذلك لوحظ تضخم الكبد والطحال، تجمع الشحوم، شحوب او احتقان الكبد. وبناء على ما تقدم يمكن

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