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HISTOCOMPARATIVE STUDY OF LIVER AND LUNG OF DONKEY AND SHEEP INFECTED WITH HYDATID CYST IN BASRAH CITY

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ABSTRACT

Echinococcus is the smallest cestodes that can be found as adult form in the intestine of wild and stray canine, while, the larval stage (hydatid cyst) found in carnivores animals and human. This study focusing on comparative study in histopathological changes between sheep and donkey that liver and lungs were infected with hydatid cyst in Basrah city. And the results was some with similar other with deferrers, but the most one was calcification in lungs of sheep, clear congestion in liver of donkey, fibrosis in both organs at both animals, so, the risk factors for human infection was in high level because these two animals was an causative agents for speared the infection in Basrah city even than an stray dogs.

INTRODUCTION

Echinococcus is the smallest cestodes found in the intestine of carnivores, that belong to Cyclophyllidea order, Taeniidae family(Urquhart et al. 1987). The historical preview referred that Rudolphiwho established the genus Echinococcus and placed in order, then classified tothe three different species, which was *E. hominis*, *E. simiia*, and *E. veterinorum*, themodern techniques, found and discovery of DNA and knowledge of its tools in the science of molecular, focused on a lot of new characteristics that been identified in the parasites study, and there was a step towards the reclassification Echinococcus, particularly *E. granulosus*. classification of parasites is not only relied on the existence of such parasites traits but also a relationship with a host that reservoir this parasite(Grove 1990).

Molecular technique that used for detection parasite either in faecal or hydatid cyst samples that isolated from carnivore'shosts (dogs, foxes, and wolves), slaughtered animals and patients, to identify species genetically. The amount of antigenic parasites were a few or a large, genetics tools such as RFLP has able to detect the parasite. This is used routinely to observe infection or reinfection of Echinococcus in faeces of dogs (Borji and Jahangiri 2013).

Furthermore, PCR procedure has been used to identify Echinococcus in different carnivores like(foxes, wolves and hyena)(Beiromvand *et al.* 2011).

PCR also have been using to detection hydatid cyst in human, sheep, goat, camel, cattle and pigand follow to sequencing the mitochondrial genome to differentiation between different species of Echinococcus (Dinkel *et al.* 2004). One of methods in developing PCR, introduced dot blot assay targeting the mitochondrial gene NADH dehydrogenase subunit 1 (nad1) for differential diagnosis of taeniid eggs (Armua-Fernandeza *et al.* 2011).

There were different studies about hydatid cyst in different animals, for example; Al-Azizz *et al.,* (2014) noticed an incident case of donkey with pulmonary hydatid cyst infection with many pathological changes, like thick fibrous capsule, with calcification, other fibrous capsule at the periphery capsule with infiltration of inflammatory cells and pulmonaryfibrosis with few and massive inflammatory cells, and found that hydatid cyst in donkey indicating more resistant response than that by sheep and cattle.

The aim of this study was to make a comparative study in histopathological changes between sheep and donkey that liver and lungs were infected with hydatid cyst in Basrah city.

Materials and Methods:

-Samples Collection:

A total of five donkeys brought to the College of Veterinary Medicine at Basrah University for anatomy and histology purpose for teaching student in undergraduate stages. In some of them after during anatomyan accidently found a cyst in the lungs and liver and during microscopic investigation finding the cyst referred to hydatid cyst. By the other hand, sheeps that slaughtered in slaughter house at Basrah city found mostly infected with hydatid cyst, mostly found in liver. The hydatid cysts from both animals were isolated carefully and put it in close container with 10% formaldehyde.

-Histological Techniques

The lesion in lungs and liver was present as scattered nodules, then, the method of (Luna, 1968) was done for histological study.

Results:

1-Liver of sheep

The section of sheep's liver with hydatid cyst noticed different pathological changes; like, large chronic hydatid cyst enclosed by fibrosis inflammatory cells and aggregate of

lymphocytes, some with superficially areas of congestion (Figs. 1, 2). A massive fibrosis and aggregator lymphocytes centrally areas of necrosis, periportal fibrosis, other, periportal fibrosis and proliferation of bile duct epithelium (Figs. 3, 4).

2-Lung of Donkey

The sections of donkey's lungs found with chronic hydatid cyst with marked fibrosis and calcification, some, marked fibrosis and calcification and congestion (Figs. 5, 6).

3-Liver of Donkey

The liver of donkey infected with hydatid cyst noticed periportal fibrosis and congestion (Fig.7).A periportal fibrosis and aggregation of lymphocytes (Figs. 8,9).An periportal fibrosis and bile duct proliferation found in (Fig. 10). Fig. (11) noticed a marked fibrosis and central necrosis. An fibrosis and central necrosis other with periportal fibrosis and bile duct proliferation and congestion found in (Figs. 12, 13, 14). Periportal fibrosis and decongested dilated portal vein (Fig. 15). While, proliferation of the bronchial epithelial lining noticed in (Fig.16). Chronic hydatid cyst with fibrosis and congestion and central necrosis found in (Fig. 17).

4-Lungs of Sheep

chronic hydatid cyst with fibrosis and calcification found in (Figs. 21, 22).

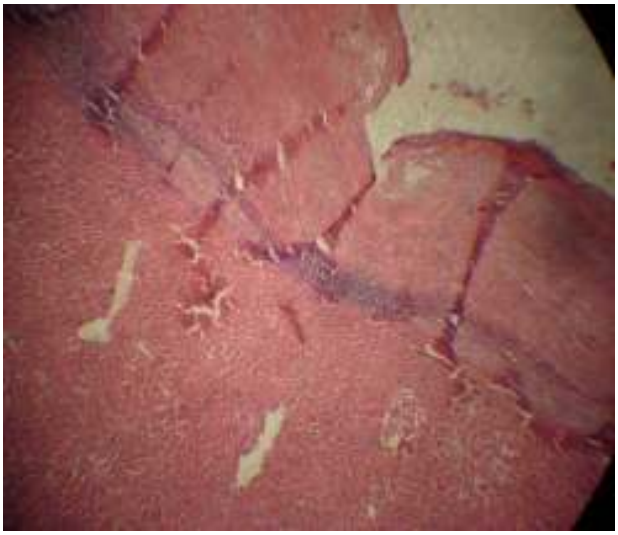

Fig. (1); liver of sheep with large chronic hydatid cyst enclosed by fibrosis, inflammatory cells, aggregation of lymphocytes.

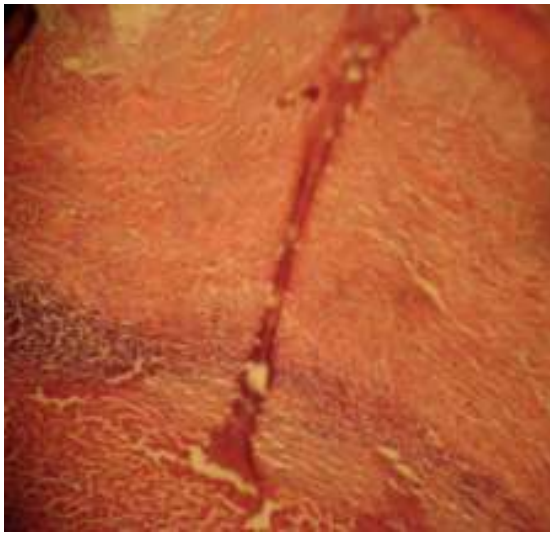

Fig. (2); liver of sheep areas of congestion superficially.

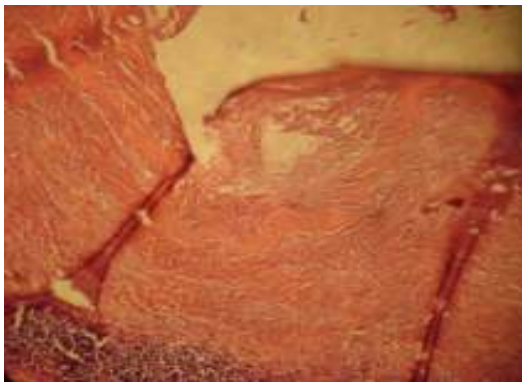

Fig. (3); liver of sheep mass of fibrosis and aggregates of lymphocytes with central necrosis and periportal fibrosis

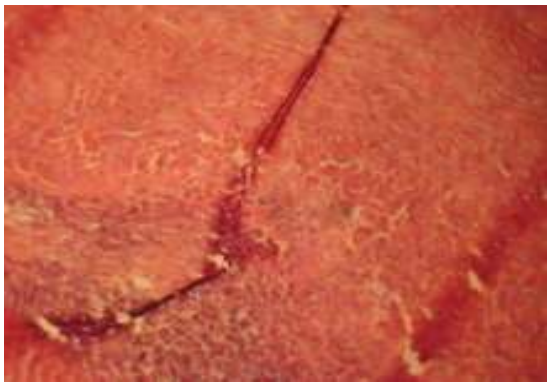

Fig. (4); liver of sheep periportal fibrosis and duct proliferation.

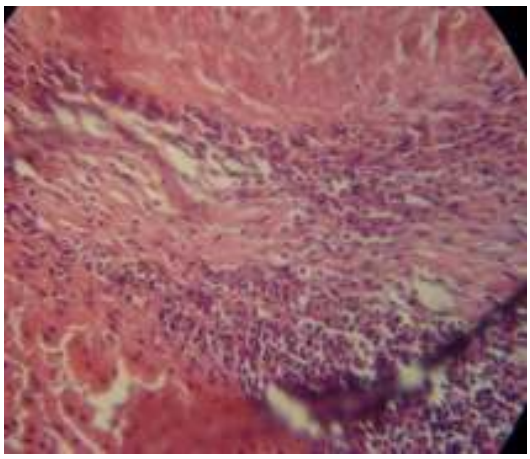

Fig. (5); Lung of donkey chronic hydatid cyst with marked fibrosis and calcification

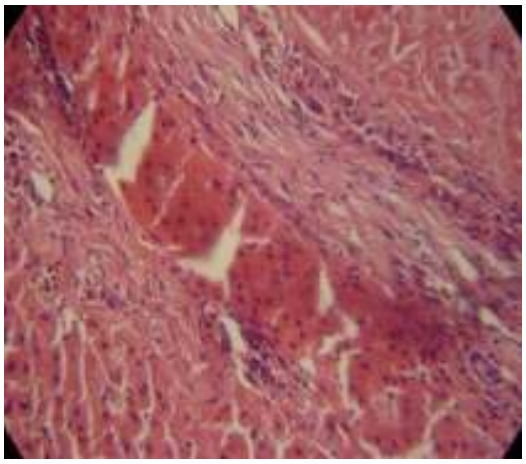

Fig. (6); Lung of donkey hydatid cyst with marked of fibrosis, calcification and congestion.

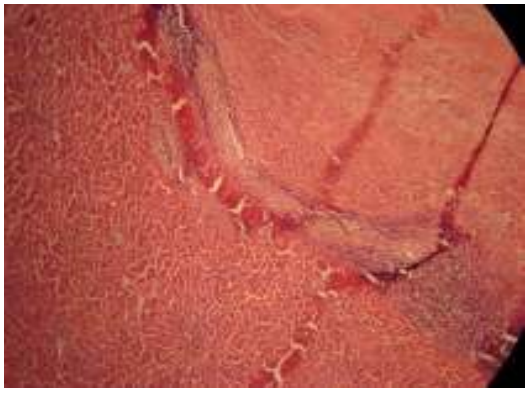

Fig. (7); Liver of donkey periportal fibrosis and congestion.

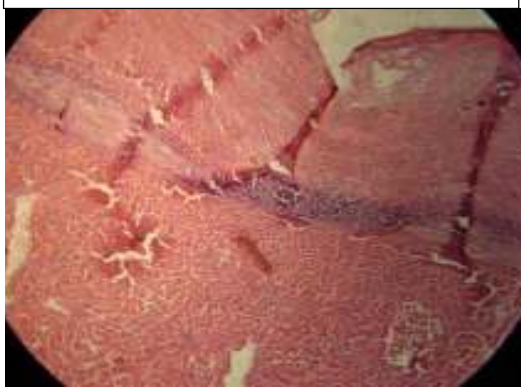

Fig. (8); Liver of donkey periportal fibrosis and aggregation of lymphocytes.

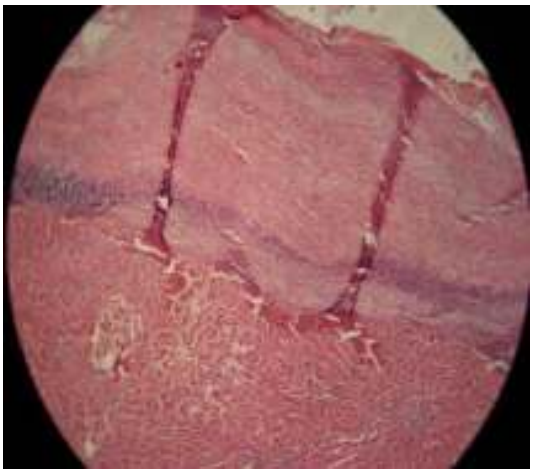

Fig. (9); Liver of donkey periportal fibrosis and aggregation of lymphocytes.

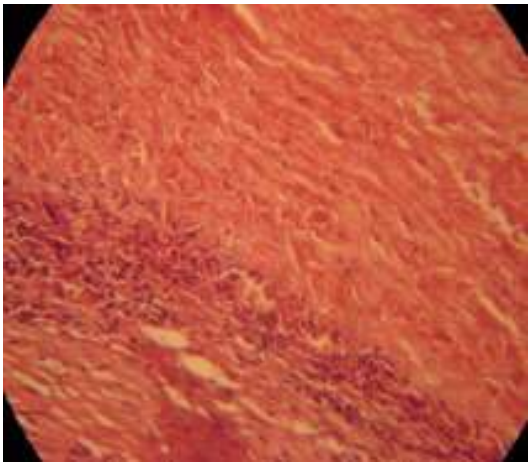

Fig. (10); Liver of donkey periportal fibrosis and bile duct proliferation.

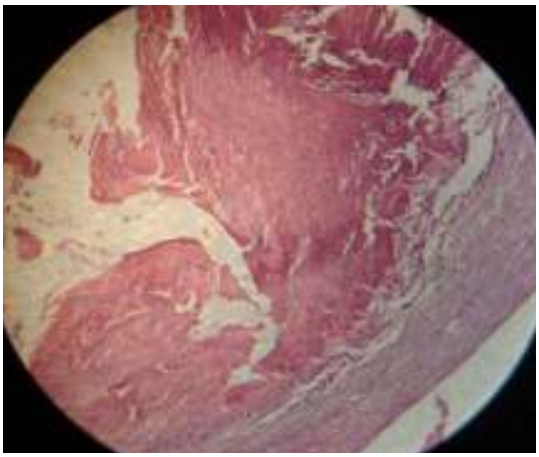

Fig. (11); Liver of donkey of hydatid cyst, marked fibrosis and central necrosis.

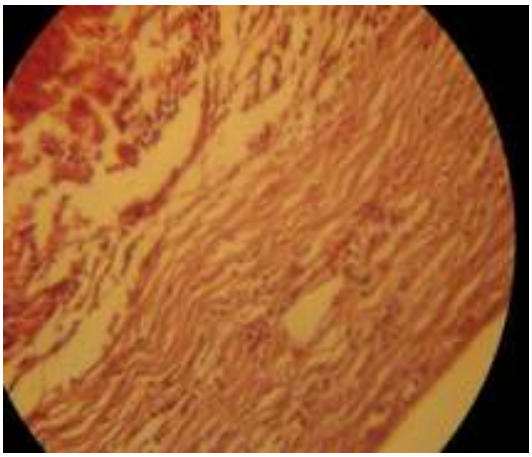

Fig. (12); Liver of donkey hydatid cyst, note fibrosis and central necrosis.

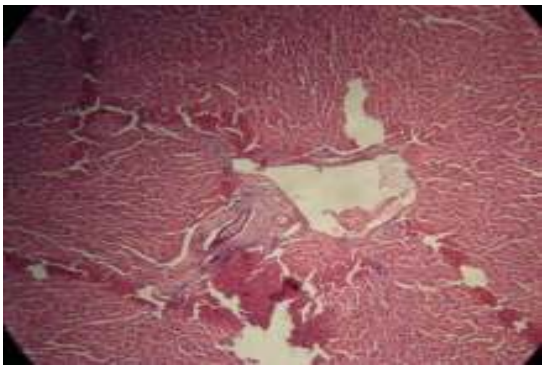

Fig. (13); Liver of donkey periportal fibrosis and bile duct proliferation.

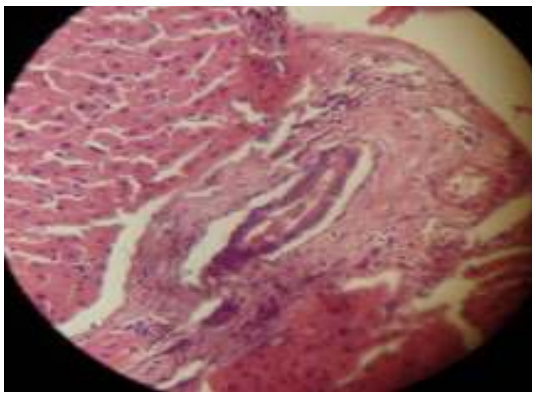

Fig. (14); Liver of donkey periportal fibrosis and congestion.

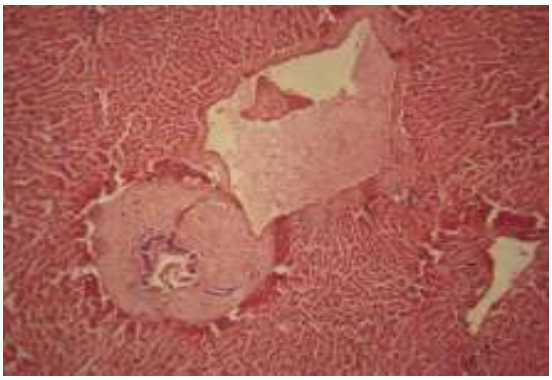

Fig. (15); Liver of donkey periportal fibrosis and decongested dilated portal

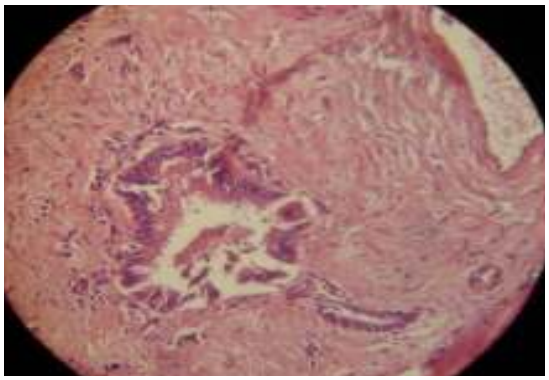

Fig. (16); Lung of donkey note, proliferation of the bronchial epithelial lining.

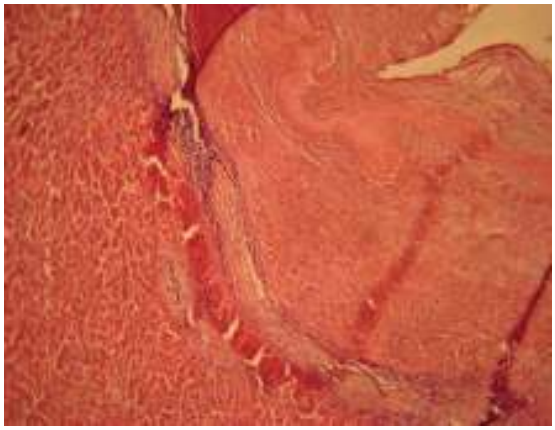

Fig. (17); Liver of donkey chronic hydatid cyst with fibrosis and congestion.

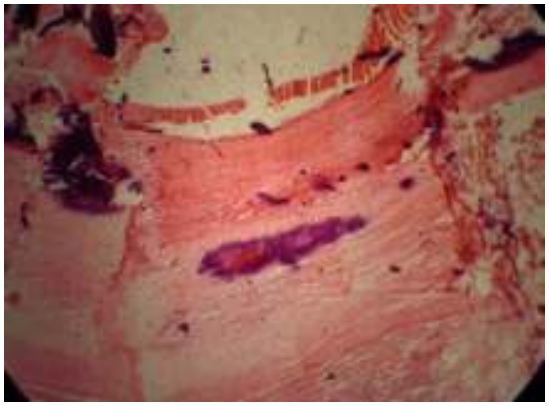

Fig. (18); Lung of sheep chronic hydatid cyst with fibrosis and congestion and central necrosis.

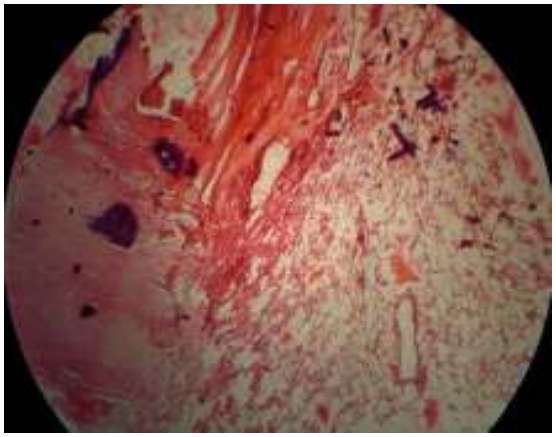

Fig. (19); Lung of sheep chronic hydatid cyst with fibrosis and central necrosis.

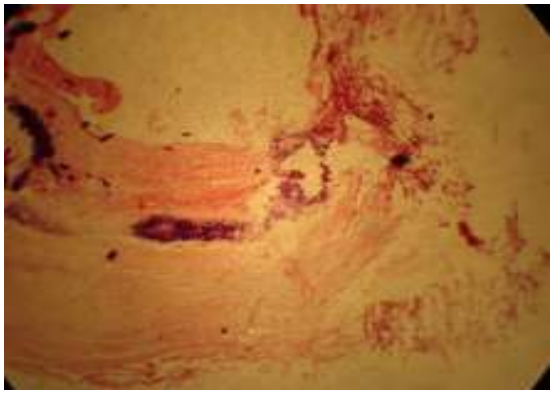

Fig. (20); Lung of sheep chronic hydatid cyst with fibrosis, calcification and central necrosis.

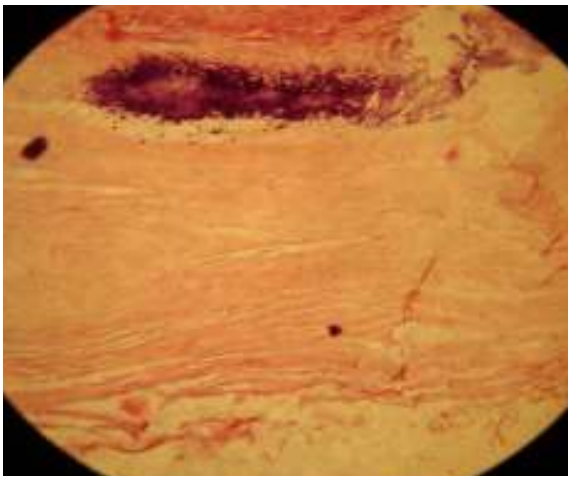

Fig. (21); Lung of sheep chronic hydatid cyst with fibrosis and calcification.

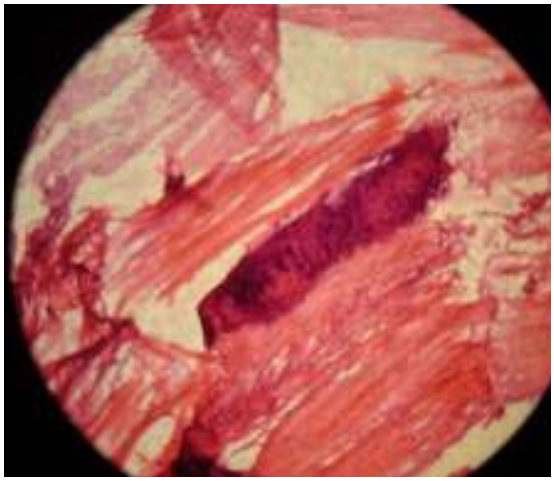

Fig. (22); Lung of sheep chronic hydatid cyst with fibrosis and calcification.

Discussion

The present research is comparison of hydatid cyst in liver and lung of sheep and donkey with hydatid cyst infection. In both, the reaction of the host to the presence of hydatid cyst whether it is in liver of sheep or liver of donkey, there was very clear chronic inflammatory reaction characterized by fibrosis associated with lymphocytic reaction and congestion, centrally with areas of necrosis.

Hydatid cyst in lungs of donkey is not a common finding as that of in an common organs even in the liver, but presence of hydatid in uncommon organs even in the brain was reported by (Mumtaz *et al.,* 2009) as they reported cerebralhydatid cyst in children, but no histopathological analysis was done. Furthermore, Mumtaz*et al.,* (2009) incited other authority reporting hydatid cyst in the brain such as (Ersahin*et al.,* 1993; Abu-Eshy, 1998; Pasaoglu*et al.,* 1989; Boudwara *et al.,* 1999). By the other hand, Kumar *et al.,* (2003) using ultrasonography and computed tomography for studying hydatid cyst in liver of human as a case reported with evidence of calcification, but the case in 71 year old woman and was only the clinical finding was reported.

The above finding showed the possibility of presence of hydatid cyst in liver of human and the present research which described histopathological hydatid in liver of sheep and donkey and it can be of benefit for comparative pathology between human and sheep and donkey. From all the above it showed the importance of comparative pathology between human and animals in describing the histopathology of hydatid cyst.

Abu-Hasan *et al.,* (2001) studied human cystic Echinococcus in west bank of Palestine as surgical incidence and seroepidemiological study, they reported that the liver was the most common site of hydatid cysts with 69.9% of cases, lung cysts were predominate in younger age group (20 years or less) and considered cystic echinococcosis is a significant endemic disease throughout the west bank. The disease is acquired early in life is more prevalent among females than males. Behavior and life style around the spread of the disease. Also, find that liver is favored site for hydatid cyst in human.

In the present research it showed that hydatid was found in liver and lungs of sheep and donkey, also, Abu-Hasan *et al.,* (2001) showed hydatid cyst in lungs mostly in children but to a lesser extent than liver, but the present research more description of the histopathological lesions. By the other hand, Abu-Hasan *et al.,* (2001) incited Ibrahim and Gusbi, (1997) studied hydatid cyst in animal in north Africa(except Morocco), While, Schwabe and Abou-Daoud , (1961) studied the hydatid cyst in children in Lebanon, Shamhesh *et al.,* (1997) studied about the hydatid cyst in human in Libya.

The above cases reported by Abu-Hasan *et al.,* (2001) showed the importance of hydatid cyst in human and animals and the present research add more information on histopathology of hydatid cyst.

Shuja *et al.,* (1996) incited Fanto et al., (1984) about liver hydatid cyst in human and Flice *et al.,* (1990) reported hydatid cyst in man and it's treatment, all the above it can be compared with the present research reporting liver and lung hydatid cyst in sheep and donkey with additional histopathology which can be of benefit from the comparative pathology and histopathology.

Al-Azizz *et al.,* (2014) found the same pathological changes in lungs of donkey, but in this research with more calcification, congestion and inflammatory cells aggregation.

In conclusion, it can be noticed that both animals (sheep and donkey) can be taken the hydatid infection by eaten grass contaminated with *E. granulosus* ova which brought and speared from stray dogs in Basrah city, so, can transfer the infection also to the human who was under risk factors. So, it must be make a controlling program depending on killing stray dogs, the animals (sheeps) slaughter in slaughter house in the city and make a modern serological test for human.

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