

# The Presence of *Fasciola hepatica* (Liver-fluke) in Human and Farm animal (sheep, goats&cattle) in Al Diwaniya province

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انتشار الوريقة الكبديه الكبيره في الانسان والحيوانات الحقلية في محافظة الديوانية  
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## أخلاصه :

تم إجراء الفحص المجهرى ل 350 عينه خروج من الانسان 149 من ابقار، 117 من ماعز و 123 من اغنام بعد تحضيره بالفحص المباشر والترسيب في مناطق (عفك، الدغاره، الديوانيه) في محافظة الديوانية امتدت الدراسة للمدة من شهر تموز 2009 ولغاية شباط من العام 2010 للتحري عن طفيلي الوريقة الكبديه الكبيره بلغت عداد العينات من الاغنام المصابة (الموجبه) 17 (13.82%). كانت نسبة انتشار الطفيلي اكبر بين الاعمار ( 7-12 ) بلغت 21.87% واقلها في العمر 1-6 شهر بلغت 4.55% كما اشارت الدراسه الى وجود فروقات معنوية بين الذكور والإناث. بينت الدراسه ان اعلى نسبة للاصابه سجلت في قضاء عفك وكانت 18%.

## Abstract

Faecal samples of 350 human, 149 cattle, 117 goats and 123 sheep's were collected from areas around Afak, Al Dagghara and Al dewaniya. The overall prevalence of *Fasciola hepatica* was among sheep and relationship between age, sex and infection of parasite was studied.

The number of infected samples with of *F. hepatica* was 17 cases. Infections with parasite was more prevalent in female than in male with no significant difference ( $P>0.05$ ). Results regarding the relationship between different age groups of sheep and *F. hepatica* showed that highest prevalence (21.87%) of parasite was observed in age group of 7-12 months and the lowest (4.55%) in age group of 1-6 months. The prevalence was significantly different ( $P<0.05$ ) in different age groups. It was concluding that the prevalence of *Fasciola hepatica* in sheep was significantly affecting by the breed age.

## Introduction:

*Fasciola hepatica* is an important parasite of sheep, goats and cattle and has been the subject of many scientific investigations. This importance not only because of its high prevalence

rates, but also due to its enormous production losses in these animals reported from various parts of the world, such as Burma [1], Nigeria [2], Central Africa [3] [4], Bangladesh [5], Indonesia [6] and Thailand [7]. Man is not usually considered a host of *F. hepatica* but in fact this infection is not unusual in humans and infections have been reported in many countries including Europe and the USA.

The eating of watercress appears to be a common source of human infection. In addition, an experimental study suggested that humans consuming raw liver dishes from fresh livers infected with juvenile flukes could become infected.[8] The usual site of infection is the liver but in aberrant invade other sites such as the lungs may be involved. The life cycle includes freshwater snails as an intermediate host of the parasite. Fasciolosis occurs only in areas where suitable conditions for intermediate hosts exist [9]. The typical environment for this snail, including, average annual temperature higher than 20°C(minimum 8°C and maximum 32°C), high rainfall, high humidity and a short dry season with natural rivers and lakes [10].

Several authors, have studied mechanisms of resistance to *F. hepatica* in different animal species .It has been established that cattle acquire resistance to challenge infection with parasite [11]. In our knowledge, there is no study investigate the prevalence of fasciolosis in area that included in our study, thus we design this study to inspect this area about infection in human, cattle, sheep and goats.

## **Materials and methods**

### **Samples collection**

The stool collection from rectum in(sheep,goats &cattle ) but in human the sample take from persona contact with infected animals .

This study was undertaken from July 2009 to February 2010 in the around Afak, Al Daghara and Al dewaniya. samples were examined by two methods to diagnosis the egg of this parasite

#### **Direct faecal smear**

- 1- Place a drop of saline on center of slide .
- 2- With an application select a 1-2 gm faeces
- 3- Comminute faeces with saline until suspension even .
- 4- Remove coarse particles from suspension & cover with cover glass .
- 5- Examination under microscope using X10 & X40 objective

#### **Formalin – ether centrifugal sedimentation**

The method is best for concentration eggs & larvae of helminthes & cysts of protozoa .

##### **Procedure**

- 1- Transfer about 1ml of faeces to 15 gm centrifuge tube & comminute with about 3ml water
- 2- Add water to fill tube , mix and strain through gauze into paper cup . add water through gauze to make approximately 15 ml of filtrate .
- 3- Rinse centrifuge tube & return filtrate into tube for centrifuge at 2000 r.p.m for minute .
- 4- Decant of supernatant & add 10 ml of 10% formalin , thoroughly mixing the sediment .
- 5- Leave this for about 10 minutes to allow proper fixation of material in formalin .
- 6- Add 5ml of ether , stopper the tube & shake vigorously for about half a minute .
- 7- Centrifuge 2 minutes at about 1500 r.p.m.
- 8- Pour off the plug that is formed at the ether –formalin interface by a rapid tilt of the tube , care being taken not to up churn the sediment.
- 9- Remove a drop of sediment with a pipette and examine on a slide with a tinge of iodine under cover glass

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**Statistical analysis:** independent samples *t* test was used for comparison of the prevalence rates of fasciolosis in different age groups and difference between male and female infection. Differences were considered significant when  $p < 0.05$  and not significant when  $P > 0.05$ , using computer software SPSS version 11.5 for windows (SPSS, Chicago, IL, USA).

## Results and Discussion

The study was conducted to reveal the prevalence of *F. hepatica* in Al Diwaniya province, Iraq in areas around Afak, Al Daghara and Al dewaniya city, from –july 2009 to February 2010. Faecal samples were obtained from 350 human, 149 cattle, 117 goats and 123 sheep.

According to inspection of faecal samples from human that included in our study, all samples have no egg, i.e. not infected (table 1). Transmition of infection need to presence of snail (intermediate host) and it need to special environmental condition (rainfall weather, high moister) [10], and same condition not found in area where we inspect the infection. On the other hand, the food consumption habit of people there (good cooking and washing the vegetable) make a barrier to prevent of disease.

**Table (1): Prevalence of *Fasciola hepatica* infection in human.**

Sample		Infected	%
M	210	-	-
F	140	-	-
Total	350	-	-

Table (2) show the total number of faecal samples of cattle and its distribution between male and female. Also there is no infections.recorded. In spite of all the cattle submitted to this study were from the same areas of sheep (that included in our study) , that may come from the idea of the cattle is more resistant [11] and need high dose of metacercariae to make infection than sheep. However, acquired resistance to *F. hepatica* infection is well known in adult cattle [10]. Calves are susceptible to the disease but in excess of 1000 metacercariae are usually required to cause clinical fasciolosis [12] in comparsim with sheep which infected with a dose (200 metacercariae) [13]. In addition, the cattle breeding is different from breeding of sheep.

**Table (2): Prevalence of *Fasciola hepatica* infection in cattle.**

Sample	Infected	%
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M	26	-	-
F	123	-	-
Total	149	-	-

All faecal sample from goats that was shown in table (3) showed no infections in the goats in the area of inspection. That may be have a relation to a grazing habit of goats when compare with sheep, A goat is a typical browser, feeding on leaves, shrubs, twigs and vines, while sheep grazing on grass and clover. As we mention above the infection need to intermediate host (snail) and special environment, especially moisture, and the type of sheep food is more suitable for exist of snail on it (more moist than goat food) [14], this may explain the absence of infection in goats that live in same area of infected sheep .

**Table (3): Prevalence of *Fasciola hepatica* infection in goats.**

Sample		Infected	%
M	27	-	-
F	90	-	-
Total	117	-	-

The overall prevalence of *Fasciola hepatica* was in sheep, 17 infected animals, distributed to 3 males and 14 females of total (123) animals (table 4).

**Table (4): Prevalence of *Fasciola hepatica* infections in sheep.**

Sample		Infected	%
Male	41	3	7.32
Femal	82	14	17.1
Total	123	17	13.82

The animals were divided into 4 age groups that was shown in table (5), statistical analysis showed significant increase ( $p < 0.05$ ) in infections among age group (7-12month) with highest infection percentage (21.87%) when compare with the age group that have lowest infected percentage (G1 1-6 months). This may be related to the life cycle of *F hepatica* and time need from ingestion of metacercariae and penetrate the intestinal wall and migrate through the abdominal cavity and the liver capsule into the liver parenchyma, and finally egg production and that take 14-20 weeks to done[15].

**Table (5): Prevalence of fasciolosis in sheep according to age.**

Age/months	-ve	+ve	Total	%
G1 (1-6)	21	1	22	4.55
G2 (7-12)	25	7	32	21.87
G3 (13-18)	36	3	39	7.7
G4 (19-24)	24	6	30	20
Total	106	17	123	13.82

The deferences in infections between male and female of sheep statistically not significant ( $p > 0.05$ ) as shown in table (4). Of total inspected sheep in area around Afak, Al Daghara and Al dewaniya, the more endemic is area around Afak (18%) when compare with others areas and shown in table (6).

**Table (6): distribution of infection of sheep in three area of province Al Diwaniya .**

Place	Total	-ve	+ve	%
Diawanya	24	21	3	12.5
Afak	50	41	9	18
Daghara	49	44	5	10.2

## **Conclusions:**

1. It could be concluded that the prevalence of *F hepatica* infections in areas that included in our study was overall in sheep species only of domestic animals.
2. The area that included in our study is free of human *F. hepatica* infections.
3. The present study has provided an indication of the epidemiology of *F hepatica* infection and has lead to developed treatment for this disease.
4. More susceptible age to infect by *F hepatica* in sheep was age group 17-12 months.
5. The study had attribute the free area of infected in human to good food conception habit and dray environment in area was included in present study.

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