Zag. Vet. J. (ISSN. 1110-1458) Vol. 42 No.1 (2014) pp 81-86

Fascioliasis In Man And Animals At Sharkia Province, Egypt

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ABSTRACT

A total of 600 faecal samples from different animal species (200 sheep, 200 cattle, and 200 buffaloes) were screened for the presence of *Fasciola gigantica* eggs at different localities, Sharkia Province, Egypt. In addition, stool samples were collected from 200 individuals at different hospital laboratories, Sharkia Province. The results revealed that *F. gigantica* eggs were detected in 97 (16.7%) out of 600 examined animals. The respective overall prevelance of *F. gigantica* eggs were 21, 15 and 12.5% in sheep, cattle and buffaloes. The prevalence of *F. gigantica* in females versus males were (26.09% Vs 14.11%), (20.91% Vs 7.78%) and (18.18% Vs 5.56%) in the examined sheep, cattle and buffaloes, respectively which indicate that *F. gigantica* was higher in female than male. The infection was higher in the age groups (0-2 years old) in examined sheep, cattle and buffaloes with a percentage of 36, 24 and 21%, respectively. The predominance of *F. gigantica* infection in relation to season was during winter to be 42% in sheep, 36% in cattle and 30% in buffaloes. The overall prevelance of *F. gigantica* infection in human was 9 (4.5%) out of 200 individuals and it was detected in 7 (5.83%) out of 120 females and 2 (2.5%)out of 80 males. In relation to age groups in human, *F. gigantica eggs* was 9.72, 1.69 and 1.45% in age individual group of (1-15), (16-30) and (>30) years old, respectively. The highest prevalence of *F. gigantica* was detected in human during winter season (14%) while in spring and autumn, it was 2% each. On the other hand, it was not detected in human' stool during summer.

INTRODUCTION

Fascioliasis is a cosmopolitan parasitic infection caused by the digenetic trematodes (*Fasciola hepatica* and *Fasciola gigantica*). It affects mainly ruminants but also other animal species, such as horses and pigs are affected. The disease causes important economic losses in the animal husbandry, estimated at US $ 3 billion per year *(1)*. Human are commonly infected through ingestion of raw aquatic vegetables containing encysted metacercariae of *Fasciola* spp. *(2)*, drinking of untreated water carrying free floating metacercarial cysts *(3)*. The Nile Delta is considered one of the most endemic areas in the world for human fascioliasis *(4)*. Traditionally, diagnosis based on observation of *Fasciola* eggs in faeces *(5)*, while the pathological findings of immature fascioliasis occurs as early as 3 weeks post-infection, whereas, parasitological diagnosis can be performed only at approximately 12 weeks post-infection in human *(6)*, 2 months post-infection in cattle *(7)* or 3 months post–infection in sheep *(8)*.

This research was conducted to study the prevalence of fascioliasis in human and animals (sheep, cattle and buffaloes) at Sharkia Province, Egypt with respect to age, sex and seasonal variation.

MATERIAL AND METHODS

A total of 600 animals' faecal samples (200 sheep, 200 cattle, and 200 buffaloes) were screened for the presence of *F. gigantica* eggs. at different localities, Sharkia Province,

Egypt. Also, faecal samples from other animals were collected from cases admitted to the Veterinary Clinic, Faculty of Veterinary Medicine, Zagazig Univeristy. In addition, stool samples were collected from 200 individuals at different hospital laboratories, Sharkia Province (Zagazig, Menia- El Kamh, Hehia, Abu-Hamad and Fakous cities). All stool and faecal samples were examined microscopically for detection of *Fasciola gigantica* eggs by using Direct unstained method as previously recommended *(9)*. Also faecal sedimentation technique and formalin-ether sedimentation technique were applied as previously recorded by others *(10, 11)*.

RESULTS

Table 1. Prevelance of *Fasciola gigantica* eggs in human stool and animal faecal samples

Host	Examined number	No. of +ve	%	No. of -ve	%
Human	200	9	4.5	191	95.5
Sheep	200	42	21	158	79
Cattle	200	30	15	170	85
Buffaloes	200	25	12.5	175	87.5
Total examined animals	600	97	16.17	503	83.83

Table 2. Prevelance of *Fasciola gigantica* eggs in human stool and animal faecal samples in relation to sex

Host	Sex	Examined number	No. of +ve	%	No. of -ve	%	Chi squar test	P value
Human	Female	120	7	5.83	113	94.17	0.444	>0.05(NS)
	Male	80	2	2.5	78	97.5		
Sheep	Female	115	30	26.09	85	73.91	0.039	<0.05(S)
	Male	85	12	14.11	73	85.88		
Cattle	Female	110	23	20.91	87	79.09	0.009	<0.01(S)
	Male	90	7	7.78	83	92.22		
Buffaloes	Female	110	20	18.18	90	81.82	0.007	<0.01(S)
	Male	90	5	5.56	85	94.44		

(P) probability value, (S) significant,(S*) highly significant, (NS) non significant.

Table 3. Prevelance of *Fasciola gigantica* eggs in human stool and animal faecal samples in relation to age

Host	Age groups	Examined number	+ve	%	-ve	%	Chi square test	P value
Human	1-15	72	7	9.72	65	90.28	0.028	<0.05(S)
	16-30	59	1	1.69	58	98.31		
	>30	69	1	1.45	68	98.55		
Sheep	0-2years	100	36	36	64	64	0.000	<0.001(S*)
	3-8years	100	6	6	94	94		
Cattle	0-2years	100	24	24	76	76	0.000	<0.001(S*)
	3-8years	100	6	6	94	94		
Buffaloes	0-2years	100	21	21	79	79	0.000	<0.001(S*)
	3-8years	100	4	4	96	96		

(P) probability value, (S) significant,(S*) highly significant.

Table 4. Prevelance of *Fasciola gigantica* eggs in human stool and animal faecal samples in relation to season

Host \ Season	Winter (No=50)				Spring (No=50)				Summer (No=50)				Autumn (No=50)			
	+ve	%	-ve	%	+ve	%	-ve	%	+ve	%	-ve	%	+ve	%	-ve	%
Human	7	14	43	86	1	2	49	98	0	0	50	100	1	2	49	98
Sheep	21	42	29	58	8	16	42	84	4	8	48	96	9	18	41	82
Cattle	18	36	32	64	4	8	46	92	3	6	47	94	5	10	45	90
Buffaloe	15	30	35	70	3	6	47	94	2	4	48	96	5	10	45	90

Winter has statistically highly significance different than other season in human and animals (P-value < 0.001).

DISCUSSION

In the current study, *F. gigantica* in animals was detected in 97 (16.17%) out of 600 examined animals. Table (1) substantiate the fact that cattle were the 2nd mostly affected animal species with a prevalence rate of 15%. Concerning the distribution of *F. gigantica* eggs in relation to animal species (table, 1), the prevalence rates were 21, 15, 12.5% in sheep, cattle and buffaloes, respectively. The infection rate of *F. gigantica* in the examined sheep was nearly similar to previously recorded by others *(12, 13)*. However, others *(14)* recorded that the percentage of *F. gigantica* eggs in examined cattle in Nigeria was 54.9%. Meanwhile, the obtained results in our study in buffaloes were inagreement with those reported by others *(15)* in Alexandria. The highest prevalence of fascioliasis in sheep may be attributed to the fact that these animals usually graze in low level than cattle and in continuous movement from place to another which in turn increase the possibility of spreading the infection *(16)*.Higher prevalence in cattle than buffaloes might be due to difference in feeding and hygienic habitats.

Concerning the occurrence of fascioliasis in animals in relation to sex, result illustrated in table (2) showed that, the prevalence of *F. gigantica* in females versus males were (26.09% Vs 14.11%), (20.91% Vs 7.78%) and (18.18% Vs 5.56%) in the examined sheep, cattle and buffaloes, respectively. It was found that the prevelance of *F. gigantica* was higher in female than male. Statistical analysis of the prevalence rate of *F. gigantica* in the examined females and males in each animal species showed the presence of statistically significant difference. This result was agreed with others *(17)*.

In the present study, fascioliasis was higher in young aged than old aged animals (table 3), where the prevalence was 36, 24 and 21%, respectively in the examined sheep, cattle and buffaloes (0-2 years old). The comparable respective prevalence in 3-8 years old animals were 6, 6, and 4%. The infection rate of *F. gigantica* in animals in this study was a significantly higher prevalence in young ages (P < 0.001). This result was inagreement with those recorded by others *(18)*.

Regarding the seasonal distribution of *F. gigantica* infection among the examined animal species, table (4) revealed that, the predominance of *F. gigantica* infection in all animal species during winter was 42, 36 and 30% in sheep, cattle and buffaloes, repectively followed by spring (16% in sheep, 8% in cattle and 6% in buffaloes). In summer, the prevalence was sharply decreased to be 8, 6 and 4% in sheep, cattle and buffaloes, repectively. On the other aspect, the percentage of *F. gigantica* eggs in examined animal was reincreased again in autumn to be 18, 10 and 10% in sheep, cattle and buffaloes, respectively and this may be attributed to improve of environmental condition in autumn. There were statistically significant

higher prevalence in winter than other season (P<0.001).

The probable reasons for high prevalence of *F. gigantica* in winter might be due to the availability of optimal environmental condition for the growth and development of the parasites ***(19)***.

Table (1) showing the prevalence of *F. gigantica* in humans' stool. The results clarified that the overall prevelance of *F. gigantica* was 9 (4.5%) out of 200 individuals. Nearly similar result was previously recorded by others ***(20)***, who recorded that the prevalence of *F. gigantica* eggs was 5.1%.

Concerning the occurrence of *F. gigantica* infection in human in relation to sex, table (2) showed that, *F. gigantica* was detected in 7 (5.83%) out of 120 females and in 2 (2.5%) out of 80 males. It was noticed, slightly higher prevalence rates of fascioliasis in females rather than males which in agreement with that previously reported by others ***(21)***. No statistically significant difference was found between the infection rates of *F. gigantica* in the examined females and males (P>0.05) and coinciding with others ***(4)***.

In our study, the examined human were divided into three age groups in order to study the distribution of *F. gigantica* infection with respect to age. *F. gigantica* infection was found to be higher in the age group of 1-15 years old (9.72%), followed by the age group of 16-30 years old (1.69%) and finally the age group > 30 years old (1.45%) (table 3). Pervious studies ***(22, 23)*** showed variation in the age distribution of *F. gigantica* infection in human. The prevalence rate of fascioliasis in human was statistically higher (P>0.05) in age group of 1-15 followed by 16-20 and >30, respectively. The variation of the age distribution of *F. gigantica* infection in human may be attributed to differences in cultural diversity, behavioral factors and hygienic measures with in each area of study ***(24, 25)***.

Table (4) showing the prevalence of *F. gigantica* in human in relation to season which reached to be 14, 2 and 2% in winter, spring and autumn, respectively. Also, it was found that, *F. gigantica* eggs were not detected in humans' stool samples collected in the summer. Higher prevalence of *F. gigantica* infection during winter than other seasons was previously recorded by ***(26)***. There was statistically highly significant difference among the infection rate of *F. gigantica* (P< 0.001).

From this study, it could be concluded that fascioliasis are spread among different animal species. Thus, the control measurements for fascioliasis in animals are one of the most important point for control of human fascioliasis.

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الملخص العربى

الدودة الكبدية فى الانسان والحيوان بمحافظه الشرقية , مصر

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تم تجميع عدد٦٠٠ عينه من روث الحيوانات (الاغنام ,الابقار والجاموس) بواقع ٢٠٠ عينه لكل حيوان من مناطق مختلفه بمحافظه الشرقيه. وتم أيضا تجميع عدد ٢٠٠ عينه براز من المترددين على معامل المستشفيات الخاصه ببعض مدن محافظه الشرقيه (منياالقمح ,ابوحماد,الزقازيق, فاقوس,هيهيا وبلبيس).تم فحص جميع هذة العينات لتواجد بيوضات الدودة الكبديه. حيث أوضحت النتائج عن تواجد الدودة الكبديه العملاقه فى عدد ٩٧ عينه من اجمالى ٦٠٠ عينه تم فحصها (١٦,١٧%) وكانت معدلات تواجد البويضات فى روث الاغنام , الابقار و الجاموس ٢١،١٥و ١٢,٥%, على التوالى.وقد أظهرت النتائج ارتفاع معدل الاصابه فى اناث الحيوانات المفحوصه عنها فى الذكور حيث كان معدلات الاصابه فى اناث الاغنام والابقار والجاموس ٢٦,٠٩%, ٢٠,٩١% و ١٨,١٨ على التوالى ,أما فى الذكور فكانت ١٤,١١%, ٧,٧٨%و ٥,٥٦%, على التوالى حيث أوضحت النتائج وجود فروق احصائيه لمعدلات العدوى فى الاناث عنها فى الذكور. من ناحيه أخرى تلاحظ وجود فروق احصائيه بين معدلات العدوى فى الفئات العمريه للحيوانات المفحوصه وكان أعلى معدل للاصابه فى الاغنام والابقار والجاموس (صفر-٢عام) هى ٣٦, ٢٤ و ٢١%, على التوالى, من ناحيه أخرى تلاحظ ارتفاع معدلات الاصابه بالديدان الكبديه خلال فصل الشتاء حيث كانت٤٢%, ٣٦% و ٣٠% فى الاغنام والابقار والجاموس على التوالى , أما فى فصل الخريف فكانت ١٨%, ١٠% و ١٠% على التوالى وفى فصل الربيع ١٦%, ٨% و ٦%, على التوالى. مع ملاحظه وجود فروق احصائيه لانتشار المرض فى فصل الشتاء عن الفصول الاخرى.

بالنسبه لمعدل تفشى الدودة الكبديه فى الانسان كانت ٤,٥% وبنسبه ٥,٨, ٢,٥% فى الاناث والذكور على التوالى. أيضا أوضحت الدراسه ارتفاع معدل الاصابه فى الفئه العمريه

(١- ١٥ عام) وبنسبه ٩,٧٢% عنها فى الفئات العمريه المختلفه والتى كانت ١,٦٩ و ١,٤٥% فى الفئه العمريه (١٦-٣٠ عام)و (> ٣٠ عام), على التوالى .أما ما يتعلق بانتشار الفاشيولا فى الانسان خلال فصول السنه كان معدل انتشار المرض أعلى فى فصل الشتاء بمعدل ١٤% عنه فى الفصول الاخرى حيث كانت أيضا ٢% لكل من فصل الربيع والخريف . أما فى فصل الصيف لم يتم اكتشاف البويضات فى براز الانسان. وقد أوضحت الدراسه باتخاذ اجراءات مكافحه المرض فى الحيوانات المختلفه كأحد الوسائل الهامه والضروريه لمكافحه المرض فى الانسان.