

EPIDEMIOLOGICAL STUDIES ON FASCIOLIASIS IN BENI-SUEF GOVERNORATE.

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Received: 8. 8. 2004.

Accepted: 25. 9. 2004.

SUMMARY

The present study aimed to determine the prevalence rates of fasciola infestation in animals (cattle & sheep) and man in Beni-Suef Governorate. 240 animals (140 cattle & 100 sheep) and 160 individuals were examined parasitologically for the presence of Fasciola eggs in their faeces and stool and serologically by using IHAT. The infestation rates were 32 (22.85%) and 40 (28.57%) out of 140 cattle as diagnosed by faecal examination and IHAT respectively. In sheep the infestation rates were 27% and 35% by faecal examination and IHAT respectively. Examination of 160 individuals revealed that the overall prevalence rates of fascioliasis were 1.25% and 6.87% by stool analysis and IHAT respectively. There was no significant difference in Fasciola infestation rate between males (6.66%) and females (7.14%). It was clearly that all ages and nearly all occupational groups were susceptible to Fasciola infestation.

The findings in this work indicated that the infestation rate of fascioliasis has no sex or age limit but it depends mainly on the feeding habit of the people and their general hygienic measures.

INTRODUCTION

Fascioliasis is a disease of herbivorous animals caused by Fasciola species (Mas-Coma, 1998). It has a world wide distribution in a large variety of grass- grazing animals among sheep, goats, cattle, buffaloes, horses, rabbits and camels (Boray, 1982 and Haridy & Morsy, 2000).

Human fascioliasis in Egypt was known on an individual basis. However, the first parasitologically confirmed cases were diagnosed in Abis area, a suburb of Alexandria Governorate which was declared an endemic focus (Farag et al., 1979). Since then, the problem has received an increas-

ing attention. Now a day, human fascioliasis has been reported from nearly all the governorates. It affects all ages (lowest 16-month-old) , both sexes, all levels of the social classes and professions, particularly the inhabitants of rural areas (Motawea et al., 2001). The severe shortage of animal protein in Egypt forced the Ministry of Agriculture to import live animals from Europe where *Fasciola hepatica* is common (Soliman, 1998). Both species of *Fasciola* co-exist in domestic animals with varying infection rates . However, infection with *Fasciola hepatica* has even become more common than *Fasciola gigantica*.

Diagnosis of fascioliasis in humans mainly depends on finding eggs in faeces, but it lacks sensitivity since eggs may not appear during acute and chronic fascioliasis (Espino et al., 1998) .Also the symptoms may be present for several weeks before eggs are recovered in stool (Hassan et al., 2001) . Moreover, stool examination can not diagnose human cases with ectopic fascioliasis (El-Shazly et al., 2001) . In addition, false positive results are accounted in stool samples following ingestion of infected livers. So, in these conditions serological tests are considered as an alternative method of confirming infection with fascioliasis (Abdel Wahab and El-Serafy, 1992 and Hasseb et al., 2003) .

The widely used indirect haemagglutination test (IHA) was chosen for this study as an important test for detection of fascioliasis at an early stage

(Gasenbeek et al., 1992) and as a good screening test, due to its low cost and easy applicability . However, the result must be supported by another specific serological test or other means of investigations like sonography. This is very important in Egypt where differential diagnosis of fascioliasis is a clinical problem especially in cases not passing ova in stool (Abdel Aaty and Hashim, 1996).

The purpose of this investigation was to determine the prevalence rates of *Fasciola* infestation in animals and man in Beni-Suef Governorate.

MATERIAL AND METHODS

During the period extended from August 2003 to April 2004, a total of 240 animals (140 cattle and 100 sheep) in Beni-Suef Governorate were subjected to examination for fascioliasis. Faecal and blood samples were collected from each animal with regarding to species, age and sex.

On the other hand , blood and stool samples were collected from 160 individuals in close contact with the animals that were examined for fascioliasis and from patients of out-patient clinic in Beni-Suef hospital beside patients who attending laboratory clinics for other investigations (blood or urine analysis) . Age, sex and occupation of each individual were recorded. The collected samples of animals and man were immediately transported to the laboratory and examined for the presence of *Fasciola* infestation.

Faecal and stool samples were examined for the presence of *Fasciola* eggs using double sieve system (fluke finder) technique according to Malone et al., (1984) obtained from the Department of Parasitology, Faculty of Veterinary Medicine, Cairo University.

Commercial IHA kits were obtained from Fumouze Diagnostics-Asnieres, France. The red cells in the kits are sensitized by an antigen prepared from a purified adult *Fasciola hepatica* worm antigen. Worms were gathered alive from bile ducts, then the antigen was purified and lipid

fractions were removed. This *Fasciola hepatica* antigen allows diagnosis of fascioliasis due to both *Fasciola hepatica* and *Fasciola gigantica* because there are common antigens between these two *Fasciola* worms (Fumouse Diagnostics, personal communication). *Fasciola* antibody titer equal or above 1:320 was considered positive as reported in the kit's instruction.

RESULTS

The results are shown in tables (1, 2, 3 and 4).

Table (1): Prevalence of fascioliasis among the examined animals in Beni-Suef Governorate.

Animal species	No. of examined animals	No. of +ve animals for fascioliasis			
		Faecal examination		IHAT	
		No.	%	No.	%
Cattle	140	32	22.85	40	28.57
Sheep	100	27	27	35	35
Total	240	59	24.58	75	31.25

Table (2): Prevalence of fascioliasis among humans in Beni-Suef Governorate according to faecal and blood examination .

Human samples	No. of examined samples	Positive cases	
		No.	%
Stool	160	2	1.25
Blood	160	11	6.87

Table 3: The data of positive individuals by stool analysis and IHAT.

Positive cases	Age	Sex	Stool analysis	IHAT titer
Case 1	7	Male	-Ve	1/320
„ 2	13	Male	-Ve	1/320
„ 3	17	Female	-Ve	1/640
„ 4	19	Male	-Ve	1/320
„ 5	22	Female	-Ve	1/640
„ 6	29	Female	+Ve	1/1280
„ 7	33	Female	-Ve	1/320
„ 8	35	Male	+ve	1/1280
„ 9	39	Male	-Ve	1/320
„ 10	47	Female	-Ve	1/640
„ 11	53	Male	-Ve	1/320

Table (4): Distribution of serologically positive human cases in different occupations in relation to sex (by using IHAT).

Sex Occupation	Male			Female			Total	+Ve No.	%
	No. exam	+Ve No.	%	No. exam	+Ve No.	%			
Farmers	37	3	8.1	18	1	5.55	55	4	7.2
House wives	-	-	-	35	2	5.71	35	2	5.7
Teachers	12	0	0	5	0	0	17	0	0
Students	17	2	11.76	8	1	12.5	25	3	12
Clerks	24	1	4.16	4	1	25	28	2	7.1
Total	90	6	6.66	70	5	7.14	160	11	6.9

DISCUSSION

Human fascioliasis caused by *Fasciola hepatica* and *Fasciola gigantica* superimposed itself as an important zoonotic disease world wide (Rim et al., 1994). In Egypt, animal fascioliasis has been identified in nearly all governorates (Soliman, 1998). Now a day, human fascioliasis is locally increasing in the last few years (Magda Amin et al., 1992, Hassan et al., 1995, Rezk et al., 2000 and Motawea et al., 2001).

This work clarified the status of animal and hu-

man fascioliasis in Beni-Suef Governorate based on the parasitological and serological (using IHAT) examinations. Table(1) indicated that the overall rates of infestation in cattle and sheep based on the faecal examination were 22.85% and 27% respectively while by using IHAT the rates were 28.57% and 35% respectively. The results of parasitological examination of cattle and sheep faeces were higher than that reported by Abd Aal et al., (1999) in Ismailia province (5.3% in cattle and 12.4% in sheep) and El-Shazly et al., (2002) in Dakahlia province (12.31% in cattle and 17.84% in sheep). On the other hand the results of

parasitological examination of cattle faeces were lower than that reported by Mahmoud (1984) in Behera (68.9%) and Salem et al., (1990) in Beni-Suef (29.7%) while the results of sheep were in line with that reported by El-Bahy (1997) in Kafr El-Sheikh (26.6%).

The results of serological examination using IHAT were higher than that reported by Abd Aal et al., (1999) in Ismailia province (18.8% in cattle and 26.7% in sheep). Generally the results of this work indicated that, the prevalence rate of fascioliasis was higher in sheep than cattle. These findings were in line with that reported by Magda Amin et al., (1992) and Abd Aal et al., (1999). The higher *Fasciola* infestation rate in sheep may be due to a reduction in available pasture, forcing the animals to graze in swampy areas and around irrigation channels, thus exposing them to vegetation heavily infested with encysted metacercariae. Through examination of 160 individuals, 2 (1.25%) of them were shedding *Fasciola* eggs in their stool while 11 (6.87%) of them were positive for IHAT.

This result was slightly higher than that reported by Abd Aal et al., (1999) who found that 2 (0.4%) out of 533 stool specimens were positive for *Fasciola* species eggs and 26 (4.9%) out of 533 blood samples were positive for IHAT. On the other hand the result of parasitological examination of

the stool of human in this work was similar to the result obtained by Magda Amin et al., (1992) (1.2%) but lower than that reported by El-Bahy (1997) in Kafr El-Sheikh (6.87%). The seroprevalence rate that obtained in this work was lower than that recorded by Makled et al., (1988), Hassan et al., (1995) and El-Shazly et al., (2002) who reported that, the infestation rates were 8.7%, 10.9% and 9.1% respectively.

In general, the direct parasitological examination is not a dependable test in human. It always misses diagnosis or gives false results in chronic cases and in cases with scanty egg deposition (Kagan, 1979 and Neva and Brown, 1998). So, serological diagnosis is the alternative method for such cases to diagnose invasive early stages of infection (Ikeda, 1998) and to detect ectopic fascioliasis (Arjona et al., 1995). Also it was found that IHAT employing purified specific antigens for fascioliasis gives good specifications (96.9%) and help to avoid cross reactions between *Fasciola* and other trematodes especially the serious endemic schistosoma (Azab and El-Zayat 1996).

In the present study (Table3), the positive fascioliasis individuals were 6 males and 5 females according the result of IHAT, while by stool analysis, fascioliasis could be recovered from only one male and one female. The age of the infested males ranged between 7 to 53 years, while in fe-

males ranged between 17 to 47 years. This result was in accordance with Samaha (1989) and Haseeb et al., (2003). There was no significant difference between the prevalence of fascioliasis in males (6.66%) and females (7.14%) as shown in table (4). This result was not in comparable with the result obtained by Zaki, (1979) who reported higher prevalence of fascioliasis in male (1.4%) than in female (0.3%). On the other hand Farag et al., (1979) , Abd Aal et al., (1999) and Motawea et al., (2001) found that the prevalence of fascioliasis in females was higher than in males . Also Hillyer (1988) stated that fascioliasis was prevalent at all ages and in both sexes. The infestation rate of fascioliasis has no sex or age limit but it depends mainly on the feeding habit of the people and their general hygienic measures (El-Bahy, 1997)

Table (4) indicated that all the community groups nearly susceptible to fascioliasis (farmers, 7.2%, house wives, 5.7%, students, 12% and clerks, 7.1%). These results were not in agreement with those reported by Mohamed, (1990) who identified fascioliasis in 2.8% farmers and 3.3% in students but could not identified fascioliasis in any of the examined house wives, teachers, officers and workers. Also Motawea et al.,(2001) stated that the infestation rate of fascioliasis was 49.4% in house wives and 24.5% in farmers.

No doubts, farmer's house wives accompanied their kids with them, when they sometimes help their husbands in the field activities or when provide them with their lunch (Motawea et al., 2001). Also, the children may acquire the fascioliasis infestation from contaminated water (King and Mahmoud, 1998). Also the establishments of restaurants serving quick meals with vegetable salads beside the habit of eating raw green vegetables directly without proper washing have increased the probability for fascioliasis among all populations.

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