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EVALUATION OF LIVER FUNCTIONS IN COMBINED INFECTION WITH FASCIOLA AND SCHISTOSOMA MANSONI

By

AZIZA I. SALEM*; SAFIA S. KHALIL*, AND MONA M. ABAZA**

*From *Parasitology Department*, ** *Clinical Pathology Department*

Medical Research Institute, Alexandria University

INTRODUCTION

Schistosomiasis has been considered the major cause of liver disorder in Egypt (Bassily et al., 1983). Recently human fascioliasis is one of the causes of hepatic disorder (Maklad et al., 1988).

Coexistence of S. mansoni and Fasciola infections was reported frequently in Egypt (Farag et al., 1988).

S. mansoni infection alone does not severely affect the hepatocytes (Bassily et al., 1983) while Fasciola may lead to liver affection secondary to extensive destruction of liver parenchyma as well as the inflammatory and immunological reactions that occur (Smithers, 1982 and Abou-Basha et al., (1990).

The present study aimed at evaluation of the liver functions in patients with Fasciola infection; acute and chronic single or combined with S. mansoni infection .

MATERIAL AND METHODS

The present work was carried on five groups of patients:

1. Normal healthy controls (24).
2. Patients with acute fascioliasis (10).

3. Patients with chronic fascioliasis (30).
4. Patients with combined Fasciola and S. mansoni infection (24).
5. Patients with S. mansoni infection (30).

Acute fascioliasis cases were diagnosed depending on haematological findings and confirmed serologically by indirect haemagglutination test (IHAT). All patients were subjected to full clinical examination and some laboratory investigations including:

1. Stool examination was performed repeatedly to all patients by Kato Katz technique (1970).
2. Complete blood picture and absolute eosinophilic count (Dacie and Lewis, 1975).
3. IHAT for determination of antibody level using Fasciola antigen (Fumouse-France Kit).
4. Some liver function tests including serum levels of bilirubin, alkaline-phosphatase, amino-transferases (AST and ALT) activities, total proteins and their electrophoretic pattern (Varley, et al., 1980).

RESULTS

The majority of chronic fascioliasis patients were asymptomatic but in cases with acute fascioliasis, hepatic pain and fever were the most frequent symptoms.

Determination of antibody using IHAT revealed that 68.5% of cases with chronic fascioliasis had positive results. All the incubating fascioliasis gave positive titres. No cross reactions were observed with schistosomiasis (Table I)

Most of Fasciola cases had anaemia, however the degree was marked in combined infection as compared to single fascioliasis (Table II). As regards eosinophilic count both single or combined infection showed significant increase in eosinophilic count (Table II).

The range and mean values of the liver function tests in the different groups of patients are presented in Table (III).

The significant changes were:

An increase in alkaline phosphatase activity was detected in all groups except incubating cases.

AST was increased in incubating cases and in combined infection.

Table (IV) shows the total serum proteins and electrophoretic pattern in the studied groups.

The significant changes as compared to the normal control group were:

A decrease in total serum proteins in S. mansoni group only.
A decrease in albumin level and an increased γ-globulin in all groups except incubating cases.

A decrease in α_1-globulin in all groups.

There is a decrease in α_2 and β-globulin in incubating and S. mansoni groups of patients.

DISCUSSION

In the present study most of the patients with acute fascioliasis presented with symptoms, while chronic cases were generally asymptomatic. This finding is in accordance with the previously reported studies (Ashton et al., 1970; Hardman et al., 1970 and Bassily et al., 1989).

IHA test was applied to determine the level of specific and cross reacting antibodies in patients with fascioliasis and/or schistosomiasis. All cases with acute fascioliasis gave positive titres and 68.5% of chronic fascioliasis (single and combined) revealed positive results.

Farag et al., (1985) revealed Fasciola antibodies by IHA in 100% of cases with single fascioliasis, but in cases with combined infection, 94-100% revealed antibodies against both parasites.

No cross reactions were detected with schistosomiasis. However, Mansour et al., (1983) using crude Fasciola gigantica antigen reported cross reactions with schistosomiasis and amoebic liver abscess.

In the present work the majority of Fasciola cases whether single or combined had anaemia. This is probably due to the parasitic infection. The presence of anaemia was reported in several studies in human fascioliasis (Hardman et al., 1970; Perry et al., 1972; Ragab and Farag, 1978 and Salem et al., 1993).

Eosinophilia was present in cases with single fascioliasis and combined infection. Eosinophilia is an important diagnostic finding in fascioliasis especially in acute stage (Farid et al., 1977; Beaver et al., 1984). Marked eosinophilia was observed in the combined group of patients. This can be explained by the fact that eosinophils may show an enhanced response similar to the anamnestic antibody response on re-exposure to cross-reacting antigen (Wintrobe, 1981).

Mild disturbance in liver functions was revealed among some patients in the studied groups. Alkaline phosphatase level was found to be raised among patients with chronic fascioliasis (single or combined) than the acute cases. This was probably due to mechanical obstruction of bile ducts and/or to the toxic effect of the parasite in chronic cases (Teitz, 1982). Previous study reported elevated level of alkaline phosphatase in both acute and chronic stages of Fasciola infection (Archiman et al., 1976).

There was a significant increase in AST levels in cases with acute fascioliasis and combined ones. This may be due to affection of liver cell integrity associated with some degree of hepatic necrosis (Teitz, 1982). However, in a previous report normal AST and ALT were obtained in the acute stage (Archimandritis et al., 1976).

The present study revealed that serum bilirubin was within the normal range in all studied groups. A high serum bilirubin level was reported by Jones et al., (1977) and Liu and Han, (1980) in some cases with established fascioliasis. However, serum bilirubin may be normal in established cases and shows elevation during attacks of biliary colics (Belgraler, 1976 and Schiappacasse et al., 1985).

Total serum protein level was decreased in cases with S. mansoni infection alone. There was a decrease in serum albumin level and an increased γ-globulin in all groups except incubating cases. Alpha-1-globulin was decreased in

all groups. The changes in protein fractions can be attributed to defective hepatic synthesis.

Alterations in serum proteins and albumin values in schistosomiasis and fascioliasis were reported(Saleh, 1979 and Salem and Zaghloul,1987). It could be concluded that liver affection resulting from fascioliasis is aggravated by a concomitant hepatic schistosomiasis.

SUMMARY

In Egypt, it was reported that Fasciola and Schistosoma mansoni occasionally co-exist in the same patients.

The present work was designed to evaluate some liver function tests in cases with fascioliasis acute and chronic(single or combined- with S. mansoni infection). The total serum proteins and electrophoretic pattern were also studied. Indirect heamagglutination test was carried out for diagnosis of fascioliasis and to determine if there is cross-reaction with S. mansoni infection.

It could be concluded that liver affection resulting from fascioliasis is aggravated by a concomitant hepatic schistosomiasis.

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Table (I): Distribution of cases with open Fascioliasis (Single or combined), incubating Fascioliasis and S. mansoni by IHA titres using Fasciola antigen.

Reciprocal IHA titres	Single Fascioliasis (30)		Combined Fasciola & S. m. infection (24)		Incubating Fascioliasis (10)		S. mansoni infection (30)	
	No.	%	No.	%	No.	%	No.	%
80	8	26.6	4	16.7	-	-	23	76.7
160	2	6.7	3	12.5	-	-	7	23.3
320	6	20.0	8	33.3	1	10.0	-	-
640	9	30.0	7	29.2	4	40.0	-	-
1280	2	6.7	-	-	4	40.0	-	-
2560	3	10.0	2	8.3	1	10.0	-	-
Mean ±S.D	344±732		340±656		912±641			

$P_1 > 0.05$ "Between single and combined fascioliasis"

$P_2 < 0.05$ "Between single and incubating fascioliasis"

$P_3 < 0.05$ "Between combined and incubating fascioliasis"

Table (II): Haemoglobin levels and eosinophilic count in the control group and Fasciola cases (Single or combined).

Groups	Haemoglobin level in g/dl mean ± S.D	Absolute eosinophilic count per C.mm mean ±S.D
Control group (24)	14.5 ± 1.19	126 ± 92.87
Single Fascioliasis (30)	9.9 ± 1.9	981 ± 537
P	< 0.001	< 0.001
Combined infection (24)	9.5 ± 1.95	1198 ± 1728
P	< 0.001	< 0.01
P1	N.S	N.S

N.B.:

P: Significance between control group and each of Fasciola cases (single or combined)

P_1: Significance between single fascioliasis and combined ones.

N.S.: No significant difference.

Table (III): Liver function tests in the different groups.

Liver function tests		Control group (24)	Single Fascioliasis (30)	Combined infection (24)	Incubating (10)	S. mansoni (30)
Alkaline phosphatase K & A units/dl	range	3-11	5-38	5-44	3-24	7-32
	mean±S.D	7.72±2.06	15.8±7.65	19.1±10.7	8.7 ±6.5	15.6±6.6
P			< 0.001	< 0.001	N.S	< 0.001
P_1				N.S		
AST R & F units/ml	range	16-39	10-50	16-88	19-60	14-60
	mean±S.D	28.4±6.86	30.3±9.33	42.0±21.5	38.9±13.5	33.3±13.3
P			N.S	< 0.01	< 0.05	N.S
P_1				< 0.02		
ALT R & F units/ml	range	13-38	10-74	12-88	14-44	12-60
	mean±S.D	26 ±6.62	22.9±11.9	26.1±15.7	28.6±9.8	26.6±11.3
P			N.S	N.S	N.S	N.S
P_1				N.S		
Bilirubin mg/dl	range	0.1-0.8	0.2-0.6	0.2-0.6	0.2-0.5	0.2-0.9
	mean±S.D	0.4 ±0.22	0.4 ±0.13	0.4 ±0.12	0.4 ±0.11	0.4 ±0.17
P			N.S	N.S	N.S	N.S
P_1				N.S		

N.B.

P: Significance between control group and other studied groups.

P_1: Significance between single fascioliasis and combined ones.

N.S.: No significant difference

Table (IV): Total serum proteins and electrophoretic pattern in the different groups.

Liver function tests		Control group (24)	Single Fascioliasis (30)	Combined infection (24)	Incubating (10)	S. mansoni (30)
Total proteins g/dl	range	7.2-8.5	6.2-9	6.2-9.7	6.2-9.2	5.2-9.4
	mean±S.D	8 ±0.36	7.9±0.79	7.7±0.89	7.6±0.93	7.6±0.9
P			N.S	N.S	N.S	< 0.05
P_1				N.S		
Albumin g/dl	range	4.1-5.6	3.6-5.49	2.98-4.88	3.69-5.99	1.36-5.72
	mean±S.D	4.75±0.44	4.44±0.51	4.1±0.57	4.9±1.1	4.08±0.8
P			< 0.05	< 0.001	N.S	< 0.001
P_1				< 0.05		
Alpha-1-globulin g/dl	range	0.23-0.49	0.06-0.35	0.06-0.39	0.06-0.09	0.06-0.3
	mean±S.D	0.31±0.064	0.18±0.07	0.2±0.09	0.08±0.009	0.18±0.07
P			< 0.001	< 0.001	< 0.001	< 0.001
P_1				N.S		
Alpha-2-globulin g/dl	range	0.43-1.22	0.31-1.58	0.296-1.1	0.15-1.01	0.26-0.99
	mean±S.D	0.72±0.17	0.63±0.25	0.69±0.19	0.45±0.3	0.58±0.16
P			N.S	N.S	< 0.02	< 0.01
P_1				N.S		
Beta-globulin g/dl	range	0.68-1.37	0.43-1.28	0.62-1.46	0.46-1.25	0.57-1.22
	mean±S.D	1.02±0.19	0.93±0.24	0.94±0.21	0.73±0.25	0.88±0.17
P			N.S	N.S	< 0.01	< 0.01
P_1				N.S		
Gamma-globulin g/dl	range	0.48-2.21	1.1-2.66	0.99-4.3	0.66-2.73	0.84-3.47
	mean ±S.D	1.2 ±0.49	1.69±0.41	1.75±0.69	1.41±0.57	1.77±0.66
P			< 0.001	< 0.01	N.S	< 0.001
P_1				N.S		

N.B

P: Significance between control group and other studied groups.

P_1: Significance between single fascioliasis and combined ones.

N.S: No significant difference.