

## Role of Parasitic Infections in Patients with Obstructive Jaundice in National Liver Institute (N.L.I) Menoufiya University

Shafey D. A.; Nassef N.; Sharaf S. A.; Saad A.E.; Selim S. and Saleh S.M.

Departments of Medical Parasitology National Liver Institute and Faculty of Medicine <sup>2</sup>Menoufiya University, Egypt.

[alrowad\\_2005@yahoo.com](mailto:alrowad_2005@yahoo.com)

**Abstract:** Obstructive jaundice is a surgical problem where there is blockage of the bile duct due to many causes as biliary stones, biliary strictures, cancer head of pancreas and also parasites can cause obstruction either by direct obstruction of the duct by the worms or the parasites act as a nidus for stone formation. The aim of the present study was to evaluate the role of various parasitic infections in patients with obstructive jaundice. This study was conducted on 110 patients with obstructive jaundice chosen from the ERCP unit (Endoscopic Retrograde Cholangio Pancreatography) National Liver Institute. All patients were subjected to clinical examination, urine and stool examination. ERCP to diagnose and treat the causes of obstruction, eosinophilic count, liver functions and viral markers. IHAT was done to diagnose bilharziasis, fascioliasis and hydatidosis. Rectal snip to diagnose *S.mansoni*. ERCP in the current study revealed five cases of parasites inside the bile duct (two cases of live *Fasciola* worm, two cases of hydatid sand resulting from rupture hydatid cyst and one case of live *Ascaris* worm). IHAT (Indirect Haemagglutination Test) revealed 42 positive cases for bilharziasis, 2 positive cases for hydatidosis and 8 positive cases for fascioliasis. Stool examination was positive in 5 cases of bilharziasis, 2 cases of fascioliasis and 18 cases of ascariasis. Rectal snip was positive for *S. mansoni* in 13 cases. Eosinophilia was reported in 57.1% of bilharzial patients, 100% of hydatid patients, 62.5% of fascioliasis patients and in 72.2% of ascariasis patients. Alkaline phosphatase level was > 115 IU/L in 91% of patients, GGT was >85 IU/L in 86% of cases and direct bilirubin was >2 mg/dl in 82% of cases. From the present study it was concluded that many parasites may be a cause of obstruction of the bile duct either by direct obstruction of the duct as in case of biliary parasites or act as a nidus for stone formation.

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**Key words:** obstructive jaundice, ERCP, biliary parasites.

### 1. Introduction

Obstructive jaundice is a condition in which there is blockage of the flow of bile out of the liver. This results in an overflow of bile and its by-products into the blood, and bile excretion from the body is incomplete. Bile contains many by-products, one of which is bilirubin, a pigment derived from dead red blood cells. Obstructive jaundice causes yellowish tint to the skin and the eyes. Also it causes very dark colored urine and pale colored stools. Fever, chills, weight loss, itchy skin and diarrhea can also be signs of obstructive jaundice. One of the most frequent causes of obstructive jaundice is gallstones and biliary atresia, other causes of obstructive jaundice may include having parasites or worms inside the bile duct (**Nageshwar et al., 2003**).

Human infection with biliary flukes may be asymptomatic and the symptoms and signs are not pathognomonic, the actual number of human cases is undoubtedly much greater than that reported. Accordingly, epidemiological studies have to be carried out in endemic countries in order to try to establish the true prevalence of infections with these

flukes (**Pockros, 2004**). Living or dead *Fasciola hepatica* worm may occlude the bile ducts resulting in intraductal cholestasis or their eggs serving as a nidus for stone formation (**Mohsen and Mardani, 2008**). Hydatid cysts when rupture into the biliary tree the daughter cysts and membranes pass into the common bile duct (CBD) leading to their occlusion (**Simona et al., 2009**). In schistosomiasis the bilharzial granuloma causes biliary obstruction by direct compression on the duct, and portal vein thrombosis as a complication of bilharzial infection causes the formation of hepatopetal collateral veins a process known as cavernous transformation which leads to biliary obstruction due to compression by collateral vessels or peribiliary fibrosis caused by either ischemic or inflammatory changes (**Cinthis et al., 2010**). Adult *Ascaris lumbricoides* may migrate from the intestine up through the bile duct thereby obstructing the extrahepatic ducts (**Niraj et al., 2008**).

The diagnosis of parasitic causes of biliary obstruction could be suggested by the identification of the parasite in stool or duodenal contents.

Endoscopic Retrograde Cholangio Pancreatography (ERCP) is an excellent diagnostic tool for demonstrating the parasites in the biliary tree (**Rajan et al., 2010**).

## 2. Subjects and Methods

This study was conducted on 110 patients with obstructive jaundice attending the National Liver Institute (N.L.I) Menoufiya University.

All patients were subjected to the following: History taking, clinical examination, urine and stool examination by direct smear method and staining with trichrome stain (to demonstrate the eggs of *Ascaris*, *Shistosoma mansoni* and *Fasciola* and any other parasites). Rectal snip to diagnose *S. mansoni* was also performed. In addition Liver functions as GGT, ALP and direct serum bilirubin, viral markers and eosinophilic count. Indirect Haemagglutination Test (IHAT distributed by Fumouze Diagnostics, PERRET CEDEX/ FRANCE) to diagnose bilharziasis, hydatidosis and fascioliasis. Ultrasonography to detect any abdominal organs changes. ERCP to obtain bile samples to demonstrate parasitic eggs as *Fasciola* eggs or *Ascaris* eggs or adult worm occluding the bile duct. Microscopic and pathological examination of samples taken through the ERCP.

## 3. Results

The cases were collected over a period of two years. All patients presented with obstructive jaundice as evident clinically by yellowish discoloration of the sclera and mucous membrane and laboratory by the raised level of direct bilirubin > 2 mg/dl in 82% of cases and raised liver function tests especially serum alkaline phosphatase ALP > 115 IU/L in 91% of cases and gamma glutamyl transpeptidase GGT > 85 IU/L in 86% of cases.

ERCP method revealed 50% of cases were due to benign causes (gallstones in 74.5%, strictures in 9%, inflammatory masses in 7% and finally parasites inside the bile duct in 9% of cases) and 50% malignant causes (**Table 1**). As regards the clinical examination, out of 110 cases, 70 cases (64%) had hepatomegaly, 9 cases (8%) had splenomegaly and 20 cases (18%) had hepatosplenomegaly (**Table 2**). ERCP diagnosed gallstones in (41) cases, out of them there were (70.7 %) positive for bilharzial infection, (22%) positive for *Ascaris* infection and (7.3 %) were positive for *Fasciola* infection. Rectal snip revealed *S. mansoni* eggs in 13 cases out of 42 cases positive by IHAT, while stool examination detected only 5 positive cases in bilharziasis and 2 positive cases of fascioliasis and 18 positive cases for ascariasis.

IHAT diagnosed 42 cases of bilharziasis, 2 cases of hydatidosis and 8 cases of fascioliasis (**Table 3**) shows the results of different methods for the diagnosis of different parasites. An attempt was made to correlate the results with the occurrence of associated eosinophilia, in the present study there was significant association between eosinophilic count and the studied group most of cases of parasitic infections had eosinophilia ( $P < 0.05$ ), in bilharziasis (57.1%), hydatidosis (100%), fascioliasis (62.5%) and ascariasis (72.2%) (**Table 4**). The direct serum bilirubin was less than 2 mg/dl in 20 cases (18%) of the patients and the level increased to above 2 mg/dl in 90 cases (82%), elevated ALP levels above 115 IU/L were recorded in (91%) of patients and also GGT levels were detected above 85 IU/L in (86%) of patients. Regarding the symptoms, clinical jaundice was most common, seen in all 110 (100%) patients followed by right upper quadrant pain in 75 (66.2%) patients, dark urine in 64 (55.2%), pruritus in 60 (54.5%), clay colored stools in 54 (49.1%) and weight loss in 48 (43.6%).

**Table (1):**

Benign causes			Malignant causes		
55 cases (50%)			55 cases (50%)		
	No.	%		No.	%
Gallstones	41	74.5%	Cancer head of pancreas	30	54.6%
Strictures	5	9%	Cancer gall bladder	14	25.5%
Inflammatory masses	4	7%	Cholangiocarcinoma	10	18%
Parasites in choledochus	5	9%	Hepatocellular carcinoma (HCC)	1	1.9%

**Table (2)**

Total no.	Hepatomegaly		Splenomegaly		Hepatosplenomegaly	
	No.	%	No.	%	No.	%
110 cases	70	64%	9	8%	20	18%
Benign jaundice	30	43%	9	8%	20	18%
Malignant jaundice	40	57%	0	0%	0	0%

**Table (3)**

Variables	Parasitic Infections								X <sup>2</sup>	P value	
	schistosomiasis N = 42		Hydatidosis N = 2		Fascioliasis N = 8		Ascariasis N = 18				
	No	%	No	%	No	%	No	%			
<u>IHAT</u>											
Positive	42	100	2	100	8	100	ND		0.0	> 0.05	
Negative <u>Stool</u>	0	0	0	0.0	0	0.0	ND				
Positive	5	11.9							34.1	<0.001**	
Negative	37	88.1	0	0.0	2	25%	18	100			
<u>Rectal Snip</u>			2	100	6	75%	0	0.0			
Positive	13	30.9									
Negative	29	69.1									

\*ND=Not done

**Table (4)**

Parameter	Groups								X <sup>2</sup>	P value
	Schistosomiasis N = 42		Hydatidosis N = 2		Fascioliasis N = 8		Ascariasis N = 18			
	No	%	No	%	No	%	No	%		
<u>Eosinophils</u>										
Normal	18	42.9%	0	0.0	3	37.5%	5	27.8	10.8	< 0.05
Elevated	24	57.1%	2	100	5	62.5%	13	72.2		

#### 4. Discussion

Obstructive jaundice may be a complication of many parasites like *Fasciola* worm (Ozer *et al.*, 2003), hydatid worm (Simona *et al.*, 2009), *Schistosoma* worm (Cinithia *et al.*, 2010) and *Ascaris* worm (Sanai *et al.*, 2007).

All obstructive jaundiced patients (110 patients) were subjected to ERCP to diagnose the cause of obstruction by taking biopsy from the mass occluding the duct and further subjected to pathological examination, and by the results of pathological examination the causes divided into benign and malignant causes: The malignant causes 55 cases (50%) were cancer head of pancreas (54.6%), cancer gallbladder (25.5%) cholangiocarcinoma (18%) and hepatocellular carcinoma (1.9%). Aziz *et al.* (2004) reported that the majority of obstructive jaundice patients were due to malignant causes (62.75) while benign causes were seen in (37.3%).

The benign cases (55 cases) were diagnosed as 41 cases gallstones disease (74.5%), 5 cases stricture of the bile duct (9%), 4 cases as inflammatory masses (7%) and 5 cases of parasites inside the choledochus (9%). These results coincided with the results of Leo *et al.* (2007) who carried out a two-year study period, on 114 patients of obstructive jaundice where in the majority of the study patients, the causes of obstructive icterus were benign illness (85%) and the malignant causes were found in the rest (15%). And benign causes were including gallstones (78%), stenosis (10%), parasites in choledochus (8%) and finally stricture of extrahepatic ducts (4%). Cheema *et al.* (2001) reported that the

main causes of obstructive jaundice were gallstones (84%) and Russell (2004) reported that the percent of cases of obstructive jaundice having parasites in choledochus was (6%) and the main cause of benign obstructive jaundice was gallstones (92.4%).

ERCP diagnosed gallstones in (41) cases, out of them there were (70.7 %) positive for bilharzial infection, (22%) positive for *Ascaris* infection and (7.3 %) were positive for *Fasciola* infection. That was explained by many authors as the parasite may act as a nidus for stone formation or provoke the disease in the bile ducts that leads to stone formation (Rajan *et al.*, 2010). Niraj *et al.* (2008) found that 72% of patients with recurrent pyogenic cholangitis (RPC) had *Ascarids* or fragments of the worm that leads to forming a nidus for stone formation, and Chong (2005) found a case of biliary ascariasis accompanied by cholelithiasis. Hesham *et al.* (2012) found that the long term complications of fascioliasis in the biliary tree were gall stones formation. Lee and Huh (2004) isolated parasite DNA successfully from the common bile duct stones. In the current study it was noticed that the stool examination detected only 5 cases of *Schistosoma* infection (out of 42 serologically positive patients). This in agreement with El-Zayadi (2004) who reported only 11 cases positive stool for schistosomiasis out of 100 serologically positive cases.

The direct serum bilirubin was less than 2 mg/dl in 20 cases (18%) of the patients and the level increased to above 2 mg/dl in 90 cases (82%), elevated ALP levels above 115 IU/L were recorded in (91%) of patients and also GGT levels were detected

above 60 IU/L in (86%) of patients. These results are coincided with that obtained by **Pincus and Abraham (2011)** who reported that the liver function tests were elevated in more than 70% of obstructed jaundice patients.

ERCP diagnosed (9%) of benign causes were parasites in choledochus, two cases of hydatidosis were recognized by finding hydatid sand inside the bile duct released after rupturing the hydatid cyst. Two live *Fasciola* worms were extracted from the bile duct. One case of live adult *Ascaris* worm also removed from the bile duct by ERCP. These results are in agreement with **Russell (2004)** who reported that (6%) of benign obstructive jaundice patients were due to presence of parasites in choledochus. While, **Martin and Laasch (2001)** reported that in benign causes of obstructive jaundice the percent of parasites inside the choledochus was less than (1%).

According to the results of indirect hemagglutination test (IHAT), *Schistosoma* infection (42 cases) were positive. This coincides with that obtained by **Carvalho and Lima (2007)** who reported that diagnosis of schistosomiasis by IHAT gives more results than that obtained by detecting *Schistosoma* eggs in the stool as antibodies remains in blood for long time and in chronic bilharziasis the eggs are trapped inside the rectal wall. hydatid infection (2 cases) were positive. *Fasciola* infection (8 cases) these results are in agreement of both **Fiakru, (2000)** and **Stephen et al. (2004)** and explained that as although the definitive diagnosis for fascioliasis can be made by detecting the eggs of the parasite in the stool or duodenal aspirates, egg detection rate is not high because of the low egg production rate of the parasite. Immunoserological tests thus became the basis for the diagnosis of fascioliasis, especially during its early stages or in ectopic infections. However, **Kaplan et al. (2002)** reported that the IHAT for diagnosis of fascioliasis was less sensitive than other methods of diagnosis and detection of the eggs in the stool and duodenal content remains the most accurate method for diagnosis.

### Conclusions

From the present study it was concluded that parasites may be a cause of obstructive jaundice either by direct occlusion of the bile duct or the parasite act as a nidus for stone formation.

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