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PARASITIC INFESTATIONS;
SURGICAL INTERVENTION

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ABSTRACT… Parasitic infections lead to burden of morbidity and mortality in developing countries. Surgeons practicing in the tropics are familiar with the parasitic disorders. **Objectives:** To determine the role of surgery in parasitic infestations of Echinococcus granulosus and Ascaris lumbricoides. **Design:** Cross sectional case series study. **Period:** Two years. **Setting:** Liaquat University Hospital Hyderabad. **Patients and methods:** All the patients with Echinococcus granulosus and Ascaris lumbricoides were admitted in the ward and were observed for different manifestations and surgical procedures aimed to cure the echinococcosis and ascariasis infestation. The data was analyzed in SPSS 16 and the frequency and percentage was calculated. **Results:** During two years study period, total sixty cases of parasitic infestations (50 cases of Echinococcus granulosis and 10 cases of Ascaris Lumbricoides) were detected at Liaquat University Hospital Hyderabad / Jamshoro. The hydatid cysts was more common in the age group of 30-39 years while the mean age ± SD in overall patients with Echinococcus granulosis infestation was 38.74±7.84 whereas it was 35.87±8.64 and 40.43±6.73 in male and female population respectively. The Ascaris Lumbricoides was more common in the age group of 15-20 years while the mean age ± SD in overall patients with Ascaris lumbricoides infestation was 16.62±5.21 whereas it was 15.42±7.31 and 16.43±5.41 in male and female population respectively. Among 47 surgically treated cases of echinococcus, the approach used were cyst evacuation and tube drainage in 40 patients, total cystopericystectomy in 04 patients and laparoscopically in 03 subjects accordingly. Seven (70%) cases of intestinal obstruction due to ascariasis underwent surgical intervention like external milking of the obstructing bolus of worms from the ileum into colon in 03 patients, intestinal resection and end to end anastomosis in 01 case and enterotomy and manual extraction of worms in 03 subjects accordingly. **Conclusions:** Hydatid disease and Ascaris lumbricoides may cause fatal complications and surgical intervention has been the valuable option.

Key words: Hydatid disease, Cyst, Hydatid cyst, Ascaris lumbricoides and surgical intervention.

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INTRODUCTION

Parasitic infections lead to burden of morbidity and mortality in developing countries. Surgeons practicing in the tropics are familiar with the parasitic disorders[1]. However, during global trade, tourism and migration, there is an increased risk of spread and increase in the number of cases as the biological properties favor propagation of parasitic diseases[2].

Hydatid disease (echinococcosis) is a parasitic infection caused by several species of Cestode Echinococcus but the most common form is E. granulosis while less common is E. multilocularis[3]. Hydatid cysts found worldwide, but are endemic in the pastoral and farming regions of Mediterranean, Eastern Europe, the Middle East, South America, Australia and South Africa[4,5]. The word 'Echinococcus', Greek in origin means 'hedge hog berry'. Hydatid disease of liver was reported by hippocrates, who identified a liver full of water. In the past hydatid disease had a very high mortality and morbidity but in the last 2-3 decades, the proper study of surgical pathology and invention of newer surgical techniques leads to decrease in mortality and morbidity[6]. The spectrum of therapeutic options extends from radical surgical removal of the parasite, drainage of the nematode cysts, antihelminthic treatment with mebendazole and albendazole and whatsoever[7].

An infestation with Ascaris lumbricoides or round worm is the most common helminthic disease in many tropical areas worldwide with predominant children population while susceptibility declines with adult life[8]. It seems to be aggravated by malnutrition accompanying immune deficiencies. Human infestation with Ascaris lumbricoides have manifold expressions and are curious interest to general surgeons[9]. These expressions vary from intestinal obstruction and obstructive jaundice to post- operative Ryle's tube obstruction. This worm occupied quite a space in surgical literature and has been recovered from various sites e.g. Eustacian tubes, fallopian tubes, urinary bladder via rectovesical fistula, heart chambers, besides gall bladder, bile duct pancreatic duct and the liver abscess[10].

Therefore, this study was conducted to evaluate the role of surgery in parasitic infestations of echinococcus granulous and Ascaris lumbricoides. The comprehensive work involves the outstanding statistical data, diligent study and devoted surgical approach.

PATIENTS AND METHODS

This two years study was carried out at Liaquat University Hospital Hyderabad / Jamshoro. The patients presenting with symptoms suggestive of echinococcosis and ascariasis infestation admitted in surgical units were enrolled and entered in the study. The inclusion criteria of the study was patients infested with hydatid disease and ascariasis with indications for surgical interventions while the exclusion criteria were the patients with multiple systemic diseases including skin disorders and other parasitic infestations. The informed consent was taken from every patient to participate in the study while the proforma was designed to save the data. The investigations performed were, blood complete picture for hemoglobin estimation and eosinophil count were estimated. Liver function tests for serum bilirubin, serum alkaline phosphate were estimated. Stool Examination for Eggs of Ascaris lumbricordes. X-ray erect abdomen was taken and Ultrasonographic evaluation of abdomen and pelvis was also performed while the serological / antigens / antibodies assessment against echinococcosis and ascariasis were also advised accordingly. After establishing the clinical diagnosis the treatment was started from the day of admission. Patients were given treatment for correction of anemia and to provide hemodynamical stability. Appropriate antibiotics as per culture and sensitivity were given and following mututal case discussion by the cooperation of whole research team consists of surgeons, the subjects underwent for appropriate and effective therapy in the form of evacuation of cyst with tube drainage, total cystopericystectomy and laparoscopic procedures accordingly as far as hydatid disease is concerned. While in cases of Ascariasis conservative line of management was initiated. The resistant and refractory cases ascariasis required surgical intervention i.e., external milking of obstruction of bolus of worms from ileum into colon, intestinal resection and end to end anastomosis and enterotomy with manual extraction of worms accordingly. All the maneuvers were performed by the cooperation of whole research team and were in medical ethics. The collected data was analyzed in SPSS version 16 and the frequency and percentage was calculated according to the study variables are concerned while the mean ±SD was calculated for numerical variables.

RESULTS

During two years study period, total sixty cases of parasitic infestations (50 cases of Echinococcus granulosis and 10 cases of Ascaris Lumbricoides) were detected at Liaquat University Hospital Hyderabad / Jamshoro. The hydatid cysts was more common in the age group of 30-39 years while the mean age ± SD in overall patients with Echinococcus granulosis infestation was 38.74±7.84 whereas it was 35.87±8.64 and 40.43±6.73 in male and female population respectively. The Ascaris Lumbricoides was more common in the age group of 15-20 years while the mean age ± SD in overall patients with Ascaris Lumbricoides infestation was 16.62±5.21 whereas it was 15.42±7.31 and 16.43±5.41 in male and female population respectively. Hydatid disease was more common in the farmers 35

(70%) whereas ascariasis was more common in unemployed subjects. Among echinococcosis and ascariasis cases, majority of the cases were from rural areas of the province i.e. 40 (80%) of echinococcosis and 07 (70%) of ascariasis respectively. Among the 40(80%) cases of echinococcosis had history of contact with dogs, sheep, etc. seen in 10 (20%) subjects. Regarding symptoms in subjects with echinococcosis, pain and lump in abdomen, distension of abdomen and constipation was commonly observed while in context to ascariasis the common symptoms observed were pain in abdomen, distension, vomiting and constipation. The eosinophil count was raised in 47 and 08 subjects with echinococcus granulosis and ascaris Lumbricoides infestation. The liver hydatid cyst was observed in all subjects with echinococcus infestation thru ultrasound of abdomen whereas the stool microscopy showed eggs of ascaris lumbricoides in patients with ascaris infestation. Regarding the surgical complications of ascariasis, out of 10 cases of ascariasis, evidence of small bowel obstruction was seen in 09 (90%) individuals while the one (10%) cases each had evidence of round worm in the biliary tract and evidence of free fluid with dilated bowel loops and absent peristalsis suggesting peritonitis respectively. Among 47 surgically treated cases of echinococcus, the approach used were cyst evacuation and tube drainage in 40 patients, total cystopericystectomy in 04 patients and laparoscopically in 03 subjects accordingly. Seven (70%) cases of intestinal obstruction due to ascariasis underwent surgical intervention like external milking of the obstructing bolus of worms from the ileum into colon in 03 patients, intestinal resection and end to end anastomosis in 01 case and enterotomy and manual extraction of worms in 03 subjects accordingly. Individuals acquired intestinal perforation with peritonitis in ascariasis was surgically treated by exploratony laparotomy and repair of perforation with non absorbable material and peritoneal toilet. The distribution of age and in relation to parasitic infestation are shown in Table I and II while the distribution of cases in relation to treatment is shown in Table III.

Age	Echinococcus granulosis		Ascaris Lumbricoides	
	Number	%	Number	%
15-19	03	06%	07	70%
20-29	07	14%	02	20%
30-39	35	70%	01	10%
40 +	05	10%	00	00
Total	50	100%	10	100%

Table-I. The distribution of age in relation to parasitic infestation

Gender	Echinococcus granulosis		Ascaris Lumbricoides	
	Number	%	Number	%
Male	40	80%	08	80%
Female	10	20%	02	20%
Total	50	100%	10	100%

Table-II. The distribution of gender in relation to parasitic infestation

	Echinococcus granulosis		Ascaris Lumbricoides	
Treatment	Number	%	Number	%
Surgical	47	94%	07	70%
Conservative	03	06%	03	30%
Total	50	100%	10	100%

Table-III. Distribution of cases in relation to treatment

DISCUSSION

Hydatid disease is well known disorder and surgical treatment has markedly changed during the recent years and some controversy exists as to the selection of surgical options. Methods used to treat patients according to the associated morbidity and mortality and in order to use the most effective surgical approach while the Ascariasis leads to surgical manifestations like intestinal obstruction that occurs usually at extremes of age whereas other manifestations like extraintestinal migration to biliary tree and peritoneal cavity and appendicitis were also reported[11]. Hydatidosis, a zoonosis infecting wild and domestic animals and humans thru tapeworm transmitted from dogs and other canidae whose larval stage develops as a liquid tumor called a Hydatid cyst[12]. In present study the individuals were enrolled and observed for Echinococcus granulosis and Ascaris lumbricoides presented at the tertiary

care teaching hospital as far as frequency and management strategy were concerned. In current study the hydatid cysts was more common in the age group of 30-39 years while the mean age ± SD in overall patients with Echinococcus granulosis infestation was 38.74±7.84 whereas it was 35.87±8.64 and 40.43±6.73 in male and female population respectively, these findings (mean age) are consistent with the study by Daali M (34.2 yrs) and Berrada et al (38.4 yrs)[13,14]. The male population was predominant in Echinococcus granulosis infestation and the finding was also reported by Tsaroucha et al and Gollackner B et al[15,16]. In present study the pain and lump were commonly observed and identified in the upper abdomen; the nature of the pain was dull aching. The incidence of frequency pain was also found by Yilmaz et al and Franciosi et al[17,18]. In the present study, the eosinophil count was raised in 47 subjects with echinococcus granulosis infestation and it can be compared to the study conducted by Alwan MH with 80% incidence[19].

In current series, the liver is the main organ to acquire infestation with hydatid cyst and it is consistent with the study by Bhobate J and Dutta MK[20,21]. Among 47 surgically treated cases of echinococcus, the approach used were cyst evacuation and tube drainage in 40 patients, total cystopericystectomy in 04 patients and laparoscopically in 03 subjects. In Sivalingam study[22], 61% of the cases had excision of cyst completely, tube drainage was used in 27.78% and marsupialization in 6.35% of the cases, partial cystectomy was done in 1.59% and other surgeries in 3.28% of the cases. In the study by Cangiotti L[23] for hydatid cyst of liver, partial pericystectomy with tube drainage was the most common treatment in 61.22%, followed by total pericystectomy 30.61% and partial liver resection in 8.17% of the cases.

The Ascaris Lumbricoides was more common in the age group of 15-20 years while the mean age ± SD in overall patients with Ascaris Lumbricoides infestation was 16.62±5.21 whereas it was 15.42±7.31 and 16.43±5.41 in male and female population respectively and it (mean age) can be compared with the studies by Villamier et al (14.5 years) and Louw JH (15 years)[24,25]. The male population was predominant in Ascaris lumbricoides infestation and it is consistent with the study by Villamizer et al and Rodriguez et al[24,26]. Pain was observed in all the cases in current series, the pain was colicky periumbilical and intermittent in majority and in few subjects and was found in the upper abdomen. The incidence of pain in various studies (Sandouk et al and Louw JH)[27,25] can be comparable with the observation of current study. In the present study, the eosinophil count was raised in 08 subjects with ascaris lumbricoides infestation and it is consistent with the study by Waller C reported an incidence of 85%[28]. In the present series Ascaris lumbricoides was identified by stool microscopy showed eggs, whereas Wright RM observed 88% patients of Ascaris lumbricoides had eggs[29]. Out of 10 cases of ascariasis, small bowel obstruction was observed in 09 (90%) individuals and the one (10%) free fluid with dilated bowel loops and absent peristalsis suggesting peritonitis due to biliary tract worm Thus, the findings can be compared with the study by Ochoa B who reported intestinal obstruction, biliary lesion and peritonitis / perforation in 85%, 27% and 70% patients with Ascaris lumbricoides infestation[30]. Seven (70%) cases of intestinal obstruction due to ascariasis underwent surgical intervention and findings are consistent with the study conducted by Mukhopadhyaya[31], where complications of ascariasis were treated surgically while the study of Chrungoo RK was also used milking, resection and anastomosis, repair of perforation and enterotomy methods[32].

CONCLUSIONS

Hydatid disease may cause fatal complication and surgical intervention has been the valuable option. The number of therapies now available is testimony to the fact that none is ideal in every clinical situation and there is need for appropriate and effective treatment to individual subjects accordingly. Ascaris lumbricoides plays a considerable role in the causation of abdominal emergencies and the clinical picture it produces misleads the health care provider unless kept in

mind the relative frequency and possible variety of specific / relevant symptoms with appropriate workup.

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Unknown

AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Dr. Ashfaque Ahmed Bhurgiri	Drafting the article and shares its expert research opinion and experience in finalizing the manuscript	
3	Dr. Ahmed Hussain	Contributed in conception and interpretation of data and give his export view for manuscript designing	
4	Dr. Syed Zulfiquar Ali Shah	Collection and acquisition of data analysis and interpretation of data and make it suitable for final revision and a corresponding author	
5	Dr. Musaib Ali Khero	Analysis and interpretation of data Contributed in conception and shares its expert research opinion	