

## CLINICAL PROFILE OF PATIENTS WITH HYDATID CYST AND MANAGEMENT AT A TERTIARY CARE CENTER

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## ABSTRACT

**Objective:** In this study, we aimed to assess the clinical profile of patients presenting to our surgical unit in the past 5 years, determined the risk factors associated with the disease, and also reviewed the management options.

**Methods:** It is a retrospective observational study in which case records, from November 2017 to February 2024, were observed for age, gender, occupation, socioeconomic status, clinical features, radiological findings (size, site, number, status, and stage), serological test (enzyme-linked immunosorbent assay), mode of intervention, and a result of the intervention (complications – cysto-biliary fistula, allergic reaction, wound complications, duration of hospitalization, and death).

**Results:** Of 33 patients studied, 42.42% of cases were from 31 to 40-year-old age group. 57.57% of cases were males. 60.6% of patients were from lower socioeconomic status. Pain abdomen was the most common symptom (84.8%) observed. Organomegaly was the most common (63.6%) sign recorded. Isolated splenic involvement was observed in 6% of cases. 51.6% of the liver hydatid cysts involved the right lobe of the liver and 12.9% had bilobar involvement. Eosinophilia was observed in 15.2% of cases. Raised alkaline phosphatase (63.63%) was the most common liver function test to be deranged. 75.8% of cases were managed with surgery.

**Conclusion:** Hydatid disease is a neglected tropical disease and continues to be a significant public health matter in tropical and developing countries. A higher general awareness and education about the disease are vital to limit significant associated morbidity and mortality.

**Keywords:** Hydatid cyst, Echinococcosis, PAIR, Albendazole, Neglected tropical diseases.

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## INTRODUCTION

Hydatid disease (HD), or echinococcosis, is a widespread zoonotic parasitic disease caused by a tapeworm that continues to be a clinical and public health problem worldwide, especially in societies involved in animal rearing and dairy farming. The larval stage of the disease develops into a hydatid cyst [1]. HD is most commonly attributed to *Echinococcus granulosus*, and the liver is the most commonly involved organ in up to 75% of the cases. The disease though can involve any organ of the body [2]. *E. granulosus* infection has been labeled as one of the neglected tropical diseases (NTDs) [3]. *E. granulosus* is cosmopolitan in distribution and is endemic in the Mediterranean region, Northern Africa, Southeastern Europe, South America, Central Asia, Siberia, and Western China [4]. The World Health Organization (WHO) study in 2010 reported the incidence of cystic echinococcosis per 100,000 population in Southeast Asia to be 0.8 [5].

The diagnosis is achieved by non-invasive radiologic imaging. Surgery has been the standard treatment for complicated cases. Open surgery is increasingly being replaced by laparoscopic surgery [6]. Minimally invasive percutaneous treatment methods have found favor in the treatment of HD. The procedures, historically reserved for situations where surgery was contraindicated or refused by patients, are increasingly used as first-line techniques. These include percutaneous aspiration, injection, and respiration (PAIR) and in combination with oral treatment by albendazole PAIR [1,6]. *E. granulosus* is estimated to affect two to three million people globally with reported mortality to be around 0.9–3.6% [7,8].

Ultrasound examination is the first available imaging technique for hydatid liver cysts in a clinical setting and there are no contraindications

to the procedure (Fig. 1). The WHO has put forward an ultrasound-based classification system that follows the natural progression of HD [9] (Table 1).

Sensitivity for enzyme-linked immunosorbent assay (ELISA) varies from 85% to 98% [10].

Computed tomography (CT) is of greater confirmatory value than ultrasound and is capable of detecting peritoneal deposits and the complications of hydatid cysts such as biliary obstruction, cholangitis, and cysto-biliary fistulas (Figs. 2 and 3). Magnetic resonance imaging is more specific than CT to detect biliary complications. Post-operative histopathological examination is confirmatory to the radiological findings [10] (Fig. 4).

The activity of hydatid liver cysts is as follows:

- CL, CE1, and CE2: active and fertile cysts
- CE3a: transitional, active, or inactive cysts
- CE3b: transitional and biologically active cysts
- CE4 and CE5: inactive cysts

CE4 is a degenerative cyst whereas CE5 is a partial or totally calcified cyst [2].

The WHO-IWGE classification sets both the staging of hepatic hydatid cysts based on the ultrasound aspect and the therapeutic attitude depending on this staging (Tables 1 and 2) [11].

In this study, we aimed to assess the clinical profile of patients presenting to our surgical unit in the past 5 years, determine the risk factors associated with the disease, and also review the management options.

**Table 1: WHO-IWGE classification of the hydatid cyst [9]**

Stage echographic aspect according to WHO-IWGE classification

CL Anechoic uniloculated cyst, with no echoes or internal sepsis

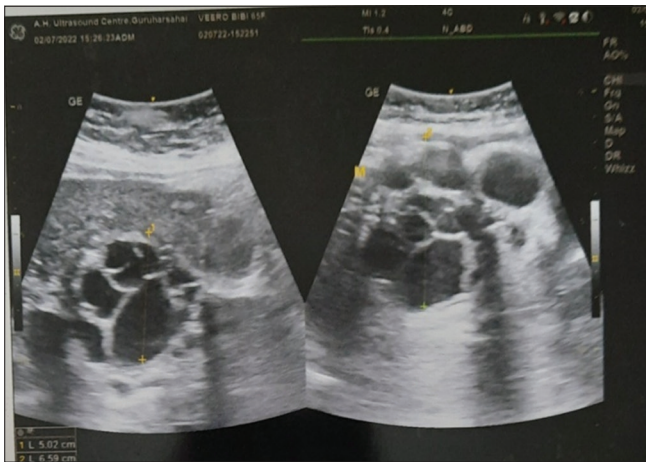
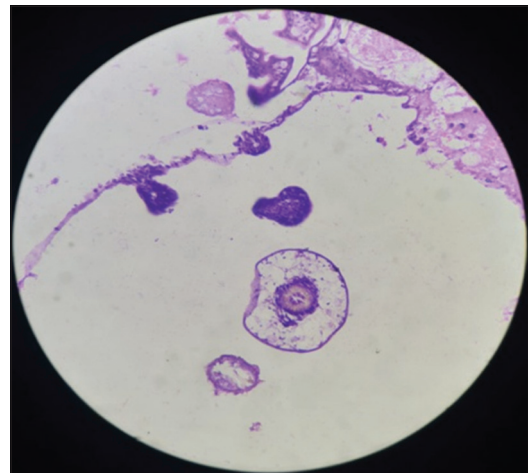
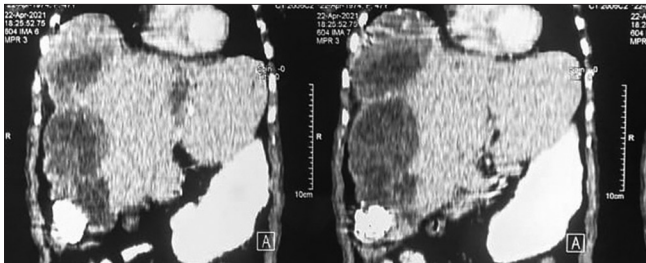
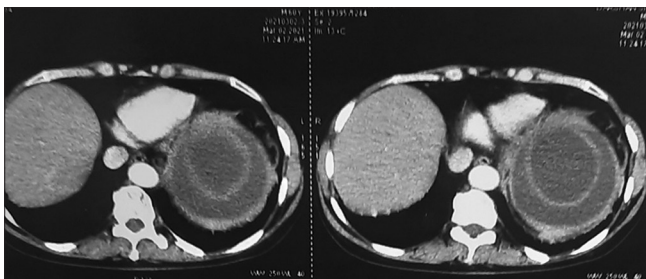
CE 1 Anechoic cyst, with fine echoes inside, representing the hydatid sand – active cyst

CE 2 Cyst with multiple septums at the interior, giving it a multivesicular aspect or “honeycomb” aspect, with a uniloculated primary cyst – active cyst

CE 3 Uniloculated cyst with decolated proligere membrane (“waterlily sign”) (CE3a) or daughter vesicles associating hypo/hyperechogenic images (CE3b) – cyst in transition phase

CE 4 Cyst with mixed content, hypo/hyperechogenic, without daughter vesicles – “wool clew” aspect cyst in the degenerative phase

CE 5 Cyst with partial or totally calcified wall – inactive cyst

**Fig. 1: Ultrasound hydatid cyst****Fig. 4: Histopathological examination of hydatid cyst****Fig. 2: Computed tomography film showing liver hydatid cyst****Fig. 3: Computed tomography film showing splenic hydatid cyst**

## METHODS

It is a retrospective observational study conducted in our surgical unit of Guru Gobind Singh Medical College and Hospital, Faridkot, India, in compliance with ethical guidelines, under patient consent. Case records, from November 2017 to February 2024, were observed for age, gender, occupation, socioeconomic status, clinical features, radiological findings (size, site, number, status, and stage), serological test (ELISA), mode of intervention, and result of intervention (complications-cystobiliary fistula, allergic reaction, wound complications, duration of hospitalization, and death). The data were analyzed with descriptive

statistics. All patients were contacted using telecommunication and the last case recorded had a minimum follow-up of 3 months.

## RESULTS AND DISCUSSION

Out of the 33 patients studied, 3% of patients were below 18 years of age. 42.42% of cases were from 31 to 40-year age group. 57.57% of cases were males. 60.6% of patients were from lower socioeconomic status. 78.8% of cases were admitted as elective cases. Pain abdomen was the most common symptom (84.8%) observed. Organomegaly was the most common (63.6%) sign recorded. Isolated splenic involvement was observed in 6% of cases. 51.6% of the liver hydatid cysts involved the right lobe of the liver and 12.9% had bilobar involvement. 69.7% of patients had cyst size of more than 10 cm. 42.4% of cases had intracavitary daughter cysts. Eosinophilia was observed in 15.2% of cases. Raised alkaline phosphatase (63.63%) was the most common liver function test to be deranged. Cystobiliary fistula was seen in 6.06% of cases. 75.8% of cases were managed with surgery. No recurrences were observed in the follow-up period.

Echinococcosis is a significant public health issue globally and is a designated NTD.

Roat *et al.* reported male involvement at 72.2%, that is higher than the 57.57%, observed in our study. They also reported the majority of the cases from rural backgrounds with low socioeconomic status, similar to the results observed in our study. They also reported the liver to be the most commonly involved organ [12]. Rampal *et al.* highlighted the rarity of primary splenic involvement and we in this current study further report splenic hydatidosis in the absence of other organ involvement [13].

Butt and Khan in a study conducted in Pakistan reported 56% of patients to be males and a median age of 42.3 years [14]. They found abdominal pain to be the most common symptom (34.7%) followed by fever. This trend is similar to the results observed in the current study.

Attribute	Frequency	Percentage
Age in years		
<18	1	3
18-30	6	18.18
31-40	14	42.42
41-50	8	24.24
51-60	3	9.09
>60	1	3
Gender		
Male	19	57.57
Female	14	42.42
Residence		
Urban	13	39.4
Rural	20	60.6
Socioeconomic status		
Upper	1	3
Middle	12	36.4
Lower	20	60.6
Admission		
Elective	26	78.8
Emergency	7	21.2
Clinical features		
Fever	9	27.3
Pain abdomen	28	84.8
Jaundice	2	6.1
Chest findings	2	6.1
Organomegaly	21	63.6
Ascites	2	6.1
Organ		
Liver		
Right lobe	16	51.6
Left lobe	11	35.5
Both lobes	4	12.9
Spleen		
Lungs		
Unilateral	2	6.0
Bilateral	1	3.0
Multiple	1	3.0
Cyst size		
>10 cm	23	69.7
5-10 cm	8	24.3
<5 cm	2	6.0
Total	33	100
Cyst nature		
Clear fluid, unilocular	6	18.18
Clear fluid, multiseptated	4	12.12
Total/partial separation membranes	4	12.12
Intracavitary native cysts (daughter cyst)	14	42.4
Solid-like mass	3	9.0
Calcified walls	2	6.0
Total	33	100
Anemia	18	54.5
Eosinophilia	5	15.2
Liver function tests		
Raised bilirubin (>17 µmol/L)	6	18.18
Raised transferase enzymes (>60 units/L)	11	33.33
Raised alkaline phosphates (>150 units/L)	21	63.63
Low serum albumin (<35 g/L)	14	42.42
IgM antibody positivity	2	6.1%
IgG antibody positivity	14	42.4
Complications		
Infected cyst	1	3.0
Cystobiliary fistula	2	6.06
Wound infections	4	12.12
Cyst rupture	1	3.03
Death	Nil	Nil
Comorbidities		
Diabetes mellitus	5	15.15
Hypertension	4	12.12
Respiratory disorders	3	9.1
Others	2	6.1%
Management		
Surgery (open and laparoscopy)	25	75.8
PAIR	3	9.1%
Conservative	5	15.15

PAIR: Percutaneous aspiration, injection, and respiration, Ig: Immunoglobulin

Table 2: Therapy protocol for hydatid cyst

Stage	Size	First option treatment	Alternative treatment
Refusal for treatment or contra indication to treatment		Albendazole for 06 months	
CE1, CE3a	Small	Albendazole 6 months)	PAIR+Albendazole for 01 month
	Medium	Surgery+albendazole (1-6 months)	PAIR+Albendazole for 01 month
	Large	Surgery+albendazole (1-6 months)	MoCaT+Albendazole for 01 month
CE2, CE3b	Small	Albendazole (6 months)	MoCaT+Albendazole for 01 month
	Medium	Surgery+albendazole (1-6 months)	MoCaT+Albendazole for 01 month
	Large	Surgery+albendazole (1-6 months)	MoCaT+Albendazole for 01 month
CE4,CE5	Any diameter	Wait and watch	Wait and watch
Complicated cyst irrespective of size	Any diameter	Surgery± interventional endoscopy± albendazole for 6 months	Surgery in case of rupture , PAIR in case of infection+ albendazole for 06 months

They reported eosinophilia in 20.9% of cases whereas we observed eosinophilia in 15.2% of cases. We observed total seropositivity for antibodies against HD to be 48.5% whereas Butt and Khan reported 38.2% seropositivity rates in the radiologically confirmed cases. They offered medical management only to 15.6% of cases, PAIR procedure combined with albendazole to 6.7% of cases, surgery only to 10.2% of cases, and combined medical and surgical therapy to 57.8% of cases. They recorded 6.2% recurrences and 3.1% mortality, whereas we observed none. Fatimi *et al.* reported 2% mortality and local recurrence rates of 0-11% [15].

Most of our patients were from rural areas and from lower socioeconomic classes. A similar association was reported by Kayal and Hussain [16].

Joshi *et al.* reported the incidence of unilocular simple cystic lesions to be the highest (29.3%) whereas we report the highest prevalence of intracavitary native cysts (daughter cyst) stage in our study [17].

Christodoulidis *et al.* reported cystobiliary fistula to be the most common post-operative complication [18]. We found surgical site infections to be the most common post-operative complication followed by cystobiliary fistula. Surgical intervention combined with oral albendazole therapy has remained the mainstay of treatment with other interventions being used where surgery is contraindicated [19].

## CONCLUSION

HD is an NTD and continues to be a significant public health matter in tropical and developing countries. A higher general awareness and education about the disease are vital to limit significant associated morbidity and mortality. A study of the risk factors and clinical profile of the affected patients have given us a fair assessment of commonly affected age groups, presenting complaints, and altered laboratory and radiological parameters. We also conclude the efficacy of minimally invasive techniques in successful management of cases. We call for broader prospective studies with adjunctive genetic workup for subtyping of the pathogens.

**AUTHOR CONTRIBUTIONS**

Conceptualization: Dr. Kapil Rampal, Dr. Ripandeep Singh, Dr. Harkanwalpreet Kaur, and Dr. Sudhir Khichy, Methodology: Dr. Kapil Rampal, Dr. Ripandeep Singh, Dr. Harkanwalpreet Kaur, and Dr. Sudhir Khichy, Formal Analysis: Data collection, Writing–Original Draft Preparation: Dr. Kapil Rampal, Dr. Ripandeep Singh, Dr. Harkanwalpreet Kaur, and Dr. Sudhir Khichy, Final Review: Dr. Harkanwalpreet Kaur and Dr. Sudhir Khichy.

**CONFLICT OF INTEREST**

Nil.

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