

EVALUATING HYDATID CYST DISEASE OF LIVER BY ULTRASOUND AND CT SCANAjad Kumar Sarawagi¹, Rajesh Kumar², Sayal Choudhary³¹Associate Professor, Department of Radiology, R. D. Gardi Medical College, Ujjain.²3rd Year Postgraduate Resident, Department of Radiology, R. D. Gardi Medical College, Ujjain.³3rd Year Postgraduate Resident, Department of Radiology, R. D. Gardi Medical College, Ujjain.**ABSTRACT****BACKGROUND**

Ultrasound helps by detecting lesions, give idea about its internal structure and also give opportunity to evaluate other abdominal organs. However, evaluation by CT scan can give additional information which can modify the course of treatment and prognosis of patient. Hence, characterisation of lesions by CT scan is vital.

The aim of this study was to evaluate hydatid cyst disease of liver by USG and CT scan for location, characterisation, age group predominance, sex predominance with demographic and clinical profile in different pathological conditions.

MATERIALS AND METHODS

This descriptive study was done at Radiology Department in CRG Hospital and RD Gardi Medical College from 2015 to 2016. It is a descriptive study. 50 patients were included in the study. Their age and sex were noted. Clinical lab findings were documented. Detailed histopathological examination of liver aspirate material was conducted and diagnosis was confirmed. The diagnosis on histopathology is correlated with USG and CT abdomen findings.

RESULT

The youngest patient was 14 years old and the oldest was 72 years old. Maximum number of patients were in age group of 31 - 40 years (32%). Minimum number of patients were in age group of 0 - 10 years (0%). Right lobe involvement was seen in 13 (52%) patients, in 10 (40%) patients left lobe involvement was seen and in 2 (8%) patients both the lobes were involved. Pain in the right hypochondrium was the most common presentation with (64%) of cases followed by weakness with (40%) of patients.

CONCLUSION

Computerised tomography is useful to determine density of a particular lesion. So useful in detection of calcification, haemorrhage, fatty changes clear and purulent fluid. It is also useful in exact determination of the extent of particular lesion and having radiation exposure, so cannot be safely used in pregnant ladies and children or repeated follow-ups. In present study, the most common affected age group was 31 - 60 years to be and followed by (16%) is > 60 years. Male-to-female ratio was suggestive of male predominance (56%). Right lobe are affected most, followed by both lobes and then the left lobe. Pain in right hypochondrium is the most common presentation followed by weakness is the next most common presentation. In liver hydatid, most common echo pattern is mix echogenic and anechoic, and right lobe is more commonly involved.

KEYWORDS

Hydatid Cyst, USG, Computerised Tomography, Characterisation, Cystic Lesion.

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BACKGROUND

Nunnari G¹ et al in 2012 stated that the clinical and therapeutic aspects of echinococcosis or hydatid disease (HD) are a zoonosis caused by the larval stages of cestodes belonging to the genus Echinococcus. Hepatic echinococcosis is a life-threatening disease, mainly differentiated into alveolar and cystic forms associated with Echinococcus multilocularis (E. multilocularis) and Echinococcus granulosus (E. granulosus) infection, respectively. Cystic echinococcosis (CE) has a worldwide distribution, while hepatic alveolar echinococcosis (AE) is endemic in the Northern hemisphere including North America and several Asian and European countries like

France, Germany and Austria. E. granulosus young cysts are spherical, unilocular vesicles consisting of an internal germinal layer and an outer acellular layer. Cyst expansion is associated with a host immune reaction and the subsequent development of a fibrous layer called the pericyst; old cysts typically present internal septations and daughter cysts. E. multilocularis has a tumour-like infiltrative behaviour, which is responsible for tissue destruction and finally for liver failure. The liver is the main site of HD involvement for both alveolar and cystic hydatidosis. HD is usually asymptomatic for a long period of time, because cyst growth is commonly slow. The most frequent symptoms are fatigue and abdominal pain. Patients may also present with jaundice, hepatomegaly or anaphylaxis, due to cyst leakage or rupture. HD diagnosis is usually accomplished with the combined use of ultrasonography and immunodiagnosis. Furthermore, the improvement of surgical techniques, the introduction of minimally invasive treatments [such as puncture, aspiration, injection, re-aspiration (PAIR)] and more effective drugs (such as benzimidazoles) have deeply changed life expectancy and quality of life of patients with HD. In E. granulosus life cycle, human is an accidental intermediate host considered as a dead

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end host. Generally, the disease in most cases remains silent for many years, but it becomes problematic when getting large enough or ruptured. Rupture into the peritoneal cavity can be accompanied by abdominal pain, urticaria, anaphylaxis reaction and sometimes sudden death. Ruptures occur spontaneously or even due to trauma, which causes severe clinical presentation. Rupture of a hydatid cyst, particularly after blunt abdominal trauma, has been rarely reported.

Diagnosis of liver pathology rests on physical examination, laboratory investigation, newer imaging techniques, radioisotope scanning, etc.

Radiological techniques like ultrasonography and CT scan have roles in evaluation of these liver diseases. Ultrasound plays an important role in evaluation of hydatid disease of liver pathology. It helps by detecting lesions, gives clue about its internal structure giving idea about its exact extent. It also gives opportunity to evaluate other abdominal organs.

Co-relation of ultrasonographic findings with clinical data, laboratory investigations and other radiological investigations lead to make a definite and accurate diagnosis. In present years, ultrasonography is widely accepted as first line radiological investigation for hydatid disease for detection. It is non-invasive, cheap, quick, free of radiation hazards, comfortable for patients, easy to re-perform and very accurate in hands of skilled operator.

With Colour Doppler, it is possible to evaluate vascularity of lesion. Ultrasonographic contrast media helps in determination of exact extent of lesion and vascularity of lesion. CT scan is very helpful to evaluate focal as well as diffuse liver pathology. Other investigations like MRI, radionuclide scanning, DSA, etc. are also helpful in liver pathology.

Background of Problem

Ultrasound helps by detecting lesions, give idea about its internal structure and also give opportunity to evaluate other abdominal organs. However, evaluation by CT scan can give additional information, which can modify the course of treatment and prognosis of patient. Hence, characterisation of lesions by CT scan is vital.

Statement of Study

CT scan is the imaging modality of choice for diagnosis and evaluating complex hydatid disease with complications.

Aim

To evaluate hydatid cyst disease of liver by USG and CT scan for location, characterisation, age group predominance, sex predominance with demographic and clinical profile in different pathological conditions.

MATERIALS AND METHODS

This study aims at following up patients with liver lesion presenting at Radiology Department in C.R.G Hospital and R.D. Gardi Medical College by using USG and CT scan, so as to achieve aims and objective outlined.

Study Setting

Department of Radiodiagnosis in C.R.G Hospital and R.D. Gardi Medical College.

Study Design

Descriptive study.

Inclusion Criteria

1. Only those patients who are willing to participate in study will be included.
2. Patients referred to the Radiology Department for ultrasonography and/or CT scan abdomen investigation and found to have liver disease will be included in this study.
3. Already diagnoses cases of such hydatid diseases, which need follow-up radiological investigations and are referred to our Radiology Department will be included in the study.
4. Patients coming for ultrasonography and CT scan for diseases other than liver disease and are accidentally found liver to have liver lesion will be included in this study.

Exclusion Criteria

1. Patients presenting to Radiology Department having liver lesion in the past and are cured completely will be excluded from the study.
2. Patient who are unfit for contrast administration.

Prerequisites

1. The recruitment of participants will be based on voluntary basis after taking a written informed consent from them for USG and CT scan after explaining them contrast related adverse effects and possible complication from interventional procedure (in required patients).
 2. HIV and HBsAg status of the patient.
 3. Investigation reports like Haemoglobin, TLC/DLC, BT/PT/CT, ESR, Urine examination, Bile salt/ Bile pigment and A/G ratio. LFT, Serum Bilirubin, Conjugated/Unconjugated, Serum alkaline phosphatase, SGPT/ SGOT and Total Protein: A/G ratio.
1. USG Machine : Mindray DC-N3, GE Logiq P6
2. CT scan Machine : GE optima CT 660, 128 spiral MDCT

RESULTS

(N= 25)

Age Group	No. of Patients	Percentage (%)
00 – 10	0	0.0
11 – 20	1	4.0
21 – 30	3	12.0
31 – 40	8	32.0
41 – 50	6	24.0
51 – 60	5	20.0
61 – 70	1	4.0
71 – 80	1	4.0
Total	25	100.0

Table 1. Age Distribution

The above table shows the distribution of patients according to age group.

The youngest patient was 14 years old and the oldest was 72 years old. Maximum numbers of patients were in age group of 31 - 40 years (32%). Minimum numbers of patients were in age group 0 - 10 years (0%).

(N= 25)

Sex	No. of Patients	Percentage (%)
Male	14	56.0
Female	11	44.0
Total	25	100.0

Table 2. Sex-Wise Distribution

The above table shows the distribution of patients according to gender.

In the present study, male patients (56%) were more as compared to female patients (44%). Male preponderance in comparison to the females was seen in our study.

(N= 25)

Lobe Involvement	No. of Patients	Percentage (%)
Right	18	72.0
Left	5	20.0
Both	2	8.0
Total	25	100.0

Table 3. Lobe Wise Distribution

The above table shows the distribution of patients according to lobe involvement.

Right lobe involvement was seen in 13 (52%) patients, in 10 (40%) patients left lobe involvement was seen, in 2 (8%) patients both the lobes were involved.

(N= 25)

Symptoms	No. of Patients	Percentage (%)
Pain in RHC	16	64.0
Jaundice	8	32.0
Fever	6	24.0
Weight Loss	8	32.0
Epigastric Pain	6	24.0
Abdominal Pain	5	20.0
Lump in RHC	4	16.0
Abdominal Heaviness	4	16.0
Weakness	10	40.0

Table 4. Clinical Presentation

The above table shows the distribution of patients according to symptoms.

Pain in the right Hypochondrium was the most common presentation with (64%) cases followed by weakness with (40%) patients.

(N= 25)

Sl. No.	Findings	No. of Patients	(%)
1.	Echogenicity:		
	Anechoic	13	52
	Mixed echogenic	11	44
	Calcified echogenic	1	04

Table 5. Radioimaging Appearance of Liver- Hydatid Cyst

The above table shows the radioimaging appearance of liver-hydatid cyst according to its echogenicity.

DISCUSSION

In the present study, 25 cases of hydatid cyst were studied by using various Radioimaging modalities and the results were compared with the previous studies.

Series	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90
Kumar series	1	2	18	5	9	13	9	1	0
Hapani series	1	2	5	15	18	6	3		
Present series	0	1	3	8	6	5	1	1	0

Discussion Table 1. Comparative Study for Sex Distribution

Kumar S² et al series, maximum number of patients were in the age group of 31 - 60 years old followed by 0 - 30 years' age group and then > 61 years' age group.

Same result has been obtained by Hapani H³ et al that maximum number of patients were in the age group of 31-60 years followed by 0 - 30 years' age group and then > 61 years' age group. Present study represents the same result with high incidence among age group of 31 - 60 years and consistent with both studies.

Series	Male %	Female %	Ratio of (M:F)
Kumar series	48.88	51.11	0.96:1
Hapani series	62	38	1.6:1
Present series	56	44	1.3:1

Discussion Table 2. Comparative Study for Sex Distribution

From the above table, it is evident that males seem to be more affected than females in Hapani³ et al and present series. In Kumar² et al series male: female was 0.96: 1. The result of present studies is consistent with Hapani et al series.

Series	Right Lobe %	Left Lobe %	Both Lobes %
Hapani H series	56	14	30
Present Series	72	20	8

Discussion Table 3. Comparative Study for Lobe Distribution

In the study of Hapani³ et al, right lobe was most commonly affected to be followed by both lobes and left lobe involvement was the least common. Same results were noticed in the present study that the affected percent was 72% for right lobe to be followed by left lobe 20% and both lobes involvement 8% was the least common. One possible reason for right lobe predominance could be large surface area and greater.

(N= 25)

Symptoms	No. of Patients	Percentage (%)
Pain in RHC	16	64.0
Jaundice	8	32.0
Fever	6	24.0
Weight Loss	8	32.0
Epigastric Pain	6	24.0
Abdominal Pain	5	20.0
Lump in RHC	4	16.0
Abdominal Heaviness	4	16.0
Weakness	10	40.0

Discussion Table 4. Clinical Presentation

In the study of Kumar² et al, pain abdomen (60%) was the most common clinical presentation. Same results were noticed in the present study that the most common clinical presentation was (64%).

Finding	Kumar S Study N= 18		Present Study N= 25	
	No.	%	No.	%
Lesion of Cyst				
(1) Right Lobe	15	83.33	18	72
(2) Left Lobe	3	16.67	5	20
(3) Both Lobe	0	0	2	8

Discussion Table 5. Comparative Study for Hydatid Cyst of Liver Location based on Ultrasound

In the study of Kumar² et al, right lobe was most commonly affected to be followed by left lobe involvement. Same results are noticed in the present study that the affected percent was 72% for right lobe to be followed by left lobe involvement of 20%.

Echogenicity:	Gurses' Study N= 42	Present Study N= 25
Anechoic	19 (45.23%)	13 (52%)
Mixed Echogenic	15 (35.27%)	11 (44%)
Calcified	0	1 (4%)

Discussion Table 6. Comparative Study for Echo Pattern of Hydatid Cyst of Liver based on Ultrasound

In Gurses⁴ et al, the most common echo pattern was found to be anechoic and followed by mixed echogenic. Same results were noticed in the present study that the incidence of most common echo pattern was equally shared between anechoic and mixed echogenic of 42.85% followed by calcified echogenicity.

CONCLUSION

The following Consolation was drawn from the Present Study

1. Ultrasound by the virtue of non-invasiveness, lack of radiation and by ability to demonstrate structural changes in organ is investigation of choice in liver pathology.
2. Ultrasound can easily detect solid to cystic lesions and characterise the size, shape and extent of lesion.
3. Computerised Tomography is particularly useful to know the enhancement pattern of the lesion i.e. centripetal and

- delayed enhancement pattern of haemangioma can be differentiated from metastatic and focal fatty changes.
4. Computerised Tomography is useful to determine density of a particular lesion. So useful in detection of calcification, haemorrhage, fatty changes clear and purulent fluid.
 5. Computerised Tomography is useful in exact determination of the extent of particular lesion.
 6. Computerised Tomography having radiation exposure cannot be safely used in pregnant ladies and children or on repeated follow-ups.
 7. In present study, the most common affected age group is 31 - 60 years to be and followed > 60 years.
 8. Male-to-female ratio was suggestive of male predominance (56%).
 9. Right lobes are affected most, followed by both lobes and then the left lobe.
 10. Pain in the right hypochondrium is the most common presentation followed by weakness is the next most common presentation.
 11. In liver hydatid, most common echo pattern is mixed echogenic and anechoic, and right lobe is more commonly involved.
 12. Finally, ultrasound and computerised tomography have their own merits and demerits. Ultrasound is non-hazardous, non-invasive, radiation free, can be quickly performed and is relatively cheaper, so it is the first line of imaging modality.

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