

ULTRASOUND; EVALUATION OF HEPATOBILIARY SYSTEM

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DR. EJAZ HUSSAIN SIDDIQUI

MBBS, DMRD, CAMS (Austria), MAMS (Austria)
Chief Consultant & Head,
Department of Radiology,
Government City Hospital,
Peshawar, Pakistan

DR. NOREEN SHAH

MBBS, MAMS (Austria)
Senior Lecturer,
Department of Community Medicine,
Khyber Girls Medical College,
Peshawar, Pakistan

MR. SAAD SIDDIQUI

Final Year Medical Student
The Aga Khan University
Karachi, Pakistan

ABSTRACT... Objectives: To assess common presenting features and the role of Ultrasound in evaluation of Hepatobiliary diseases in our population. **Design:** Cross sectional study. **Setting:** Khyber X rays, Khyber Medical Centre, Peshawar. **Period:** August 2010 to December 2010. **Material and Methods:** Data from patients presenting for evaluation of Hepatobiliary diseases was analyzed for presenting complaints and ultrasound findings according to objectives of the study. **Results:** In total 197 cases were included in the study. The age wise categorization included pediatric population (6.1%) adult population (87.3%) and geriatric population (6.6%). Upper abdominal pain was the most common presenting feature in all age groups as well as in both genders. Cholelithiasis with or without cholecystitis was the most common ultrasound finding in all age groups. No statistically significant difference was found between presenting features or ultrasound findings in different age groups as well as across gender. **Conclusions:** Hepatobiliary diseases are among major illnesses in our region. Ultrasound is a sensitive and useful tool for screening and evaluation of Hepatobiliary disorders.

Key words: Liver, Hepatobiliary, Gallbladder, Ultrasound, Abdominal Pain

INTRODUCTION

Hepatobiliary disorders are one of the most frequent illnesses encountered in medical practice. The spectrum of Hepatobiliary diseases is quite vast and affects all age groups. It includes some of the common problems like Cholecystitis, Cholelithiasis, Viral hepatitis, Cirrhosis & Chronic liver disease and malignancies e.g. Hepatocellular Carcinoma, Gallbladder Carcinoma and Metastatic foci in liver, to include a few among spectrum. The rising prevalence and Quality of life issues associated with Hepatobiliary disorders make them an important problem of our population¹⁻³.

In our region i.e. the province of Khyber Pakhtunkhwa Hepatitis C is reported as the leading cause of cirrhosis, chronic liver disease and Hepatocellular carcinoma. A similar picture is seen in other regions of Pakistan as well. Among pediatric population of the region, viral hepatitis, enteric hepatitis, drug induced liver injury and extrahepatic biliary atresia are common Hepatobiliary diseases⁴⁻¹⁶.

A number of imaging modalities like Fluoroscopy

(Cholangiography), Gray scale and Doppler Ultrasound, Contrast enhanced Ultrasound (CEUS), Endoscopic Ultrasound (EUS), Computed Tomography, Magnetic Resonance Imaging and Elastography are currently in use in evaluation of Hepatobiliary disorders. Ultrasound has the advantage of being a quick, safe and cost effective modality with no involvement of ionizing radiations. It has been shown to be the preferred initial investigation in acute abdominal pain and cholecystitis. Color Doppler ultrasound is an additional tool for evaluating liver pathologies like circulatory changes in metastasis and portal hypertension. Moreover ultrasound of liver surface is a useful tool in screening patients at risk of developing Chronic Liver Disease and Hepatocellular Carcinoma^{13,17-24}.

The sensitivity and specificity of ultrasound varies in different Hepatobiliary disorders. It is reported to be 23-95% and 40-95% in Acalculous Cholecystitis, 81-100% and 60-100% in Acute Cholecystitis, 73.3-90.5% and 69.6-85.2% in hepatic steatosis. >95% of sensitivity and specificity in Cholelithiasis, and a sensitivity of 46% in Hepatocellular carcinoma & 96% for Amoebic liver

abscess. Its overall accuracy in diagnosis of Hepatobiliary diseases is reported to be 86%²⁴⁻³².

The objectives of this study were to have an insight into common presenting features of Hepatobiliary diseases in our region and to assess the role of ultrasound in evaluation of Hepatobiliary disorders.

MATERIALS AND METHODS

This study is a record based cross sectional study carried out from August 2010 to December 2010. The site for this study was Khyber X Rays, Khyber Medical Centre, Peshawar. Most of the patients were referred by General Surgeons, Internists and Gastroenterologists. A detailed history of presenting complaints was obtained prior to conducting ultrasound examination. All patients were evaluated transabdominally by Toshiba Nemio 20® Doppler ultrasound scanner with 4.2MHz frequency transducer. Color Doppler was frequently used in evaluating liver masses and portal hypertension. Results were recorded in a standardized Microsoft Excel spreadsheet and analyzed accordingly.

Chi-square test of independence was used for statistical analysis. All results were considered significant when $p < 0.05$ ($\alpha = 5\%$).

Inclusion / Exclusion Criteria

Patients of all age groups presenting for evaluation of Hepatobiliary system including children and pregnant women were made part of the study. Patients with pancreatic & upper abdominal issues other than Hepatobiliary disorders were excluded from this study.

RESULTS

A total of 197 cases were analyzed. Overall patient population ranged from age of 3 months to 70 years. Total number of male and female patients was 87 and 110 respectively with a male to female ratio of 1:1.26. The age wise categorization included pediatric population (15 years and less) with 12 cases (6.1%), adult population (16 years to 64 years) with 172 cases (87.3%) and geriatric population (65 years and above) with 13 cases (6.6%). Data also analyzed in relation to gender distribution across various presenting features and finding on evaluation.

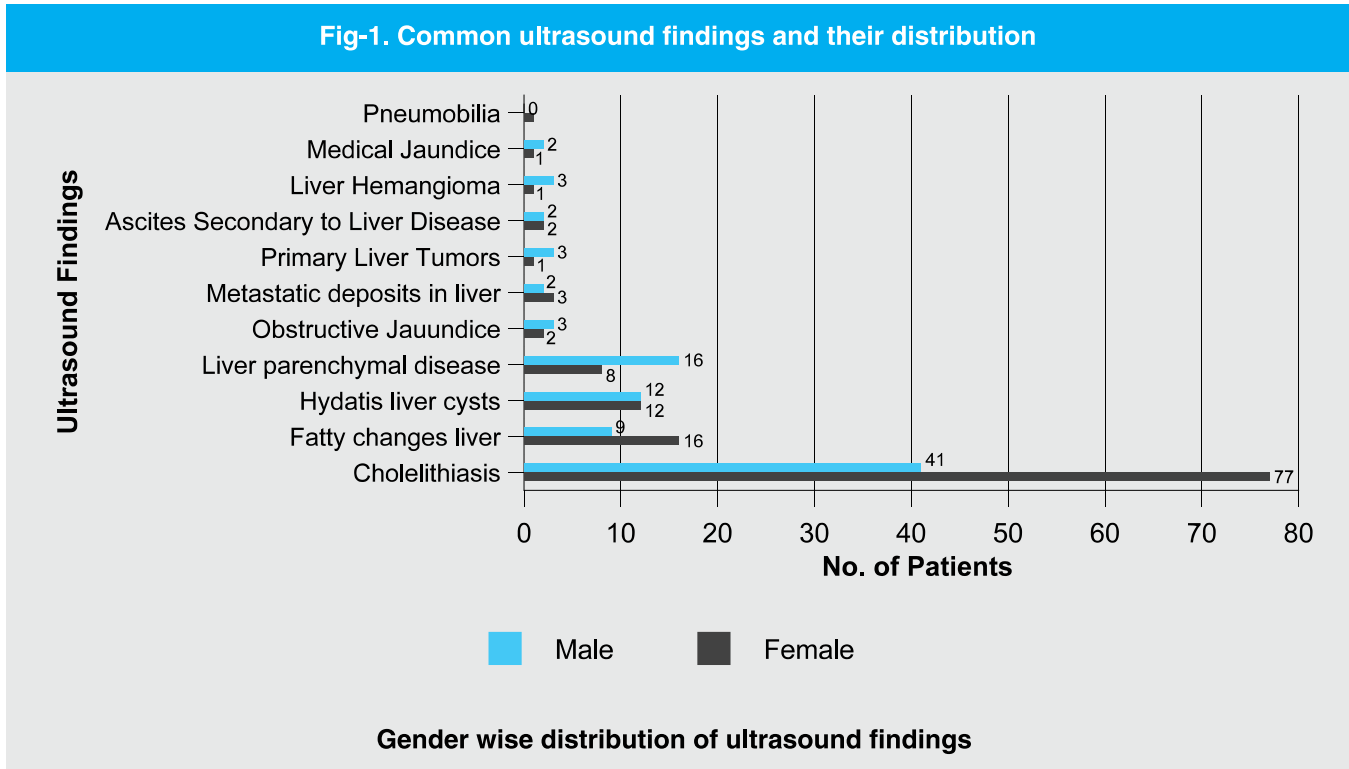
Overall Upper abdominal pain was the most common presenting complaint with 119 (60.4%) cases followed in order by Dyspepsia with 84 (42.6%), Nausea & Vomiting with 52 (26.4%) history of Hepatitis with 14 (7.12%) and Jaundice in 8 (4.1%) cases. Few patients presented with more than of the above mentioned complaints and were categorized according to their chief presenting complaint (Table I).

Table-I. Common presenting features of hepatobiliary diseases			
Presentation	Overall n (%)	Male n(%)	Female n (%)
Upper abdominal pain	119 (60.4)	42 (48.3)	77 (70)
Dyspepsia	84 (42.6)	26 (29.9)	58 (52.7)
Nausea & Vomiting	52 (26.4)	23 (26.5)	29 (26.4)
History of hepatitis	14 (7.1)	7 (8.0)	7 (6.4)
Jaundice	8 (4.1)	6 (7.1)	2 (1.8)

Overall Cholelithiasis was the most common finding with 118 (59.9%) patients, followed in order by fatty changes of liver with 25 (12.7%), Hydatid liver cysts with 24 (12.2%), Liver parenchymal disease with 24 (12.2%), Metastatic foci in liver with 5 (2.5%), Obstructive Jaundice with 5 (2.5%), Primary liver tumors with 4 (2.0%), Hemangioma of liver with 4 (2.0%), Ascities secondary to liver disease with 4 (2.0%) and Medical Jaundice with 3 (1.5%) cases. One case (0.5%) was found to have pneumobilia (Figure 1).

Among males upper abdominal pain was the most common presenting complaint with 42 (48.3%) cases followed in order by Dyspepsia with 26 (29.9%), Nausea & Vomiting with 23 (26.5%) history of Hepatitis with 7 (8.0%) and Jaundice with 6 (6.9%) cases.

Ultrasound findings in males included Cholelithiasis with 41 (47.1%) patients, followed by Liver parenchymal disease with 16 (18.4%), Hydatid liver cysts with 12 (13.8%), Fatty changes of liver with 9 (10.3%), Primary liver tumors with 3 (3.4%), Hemangioma of liver with 3 (3.4%), Obstructive Jaundice with 3 (3.4%), Metastatic deposits in liver and Medical Jaundice with 2 (2.8%) patients each.



Among female patients included in the study, the presenting complaints included upper abdominal pain with 77 (70%) cases followed by Dyspepsia with 58 (52.7%) Nausea & Vomiting with 29 (26.4%), History of hepatitis with 7 (6.4%) and Jaundice with 2 (1.8%) cases respectively.

Findings upon ultrasonographic evaluation in female patients included Cholelithiasis with 77 (70%) cases, Fatty changes of liver with 16 (14.5%), Hydatid liver cysts with 12 (10.9%), Liver parenchymal disease with 8 (7.3%), Metastatic deposits in liver with 3 (2.7%), Obstructive jaundice with 2 (1.8%), Hemangioma of liver, Primary liver tumors and pneumobilia with 1 (0.9%) case each respectively.

For a total number of 12 cases in pediatric population Upper abdominal pain was the most common presenting feature with 6 (50%) cases followed by Nausea & Vomiting with 3 (25.0%), Dyspepsia with 2 (16.7%), History of hepatitis and active jaundice with 1 (8.3%) case each. Ultrasound findings included Cholelithiasis in 3 (25%), Liver parenchymal disease in 3 (25%), and Pyloric Stenosis in 1 (0.9%).

Among Geriatric patients (n = 13), Upper abdominal pain was presenting feature in 2 (15.4%) cases, Nausea & Vomiting in 2 (15.4%) and history of hepatitis in 1 (7.7%). The most common ultrasound finding was Cholelithiasis with 6 (46.2%) cases.

No statistically significant difference was found in either presentation or ultrasound findings across gender (p = 0.074 and 0.087 respectively). Similarly no significant difference was noted in presentation or ultrasound findings of pediatric population with overall results (p = 0.195).

DISCUSSION

The male to female ratio observed in our study was 1:1.26, which was a good reflection of data available from Peshawar(1:2)³³.

Upper Abdominal pain was the most common presenting complaint in our study population. Various studies report Hepatobiliary disorders especially cholecystitis to be among one of the most frequent cause of acute abdomen³⁴.

History of hepatitis was present in 7.1% of cases. In our region as well as in other parts of Pakistan Hepatitis C is more frequent cause of Cirrhosis and Hepatocellular Carcinoma than Hepatitis B. Same findings were also reported in data from Japan^{4-10,12-16,35}.

Hydatid Liver Cysts were found upon ultrasonographic evaluation in 12.2% of cases. It represents zoonosis caused by Echinococcus Granulosus. The relatively high prevalence points toward need of Public health intervention in prevention of this disease³⁶.

Another 12.2% of cases had Liver parenchymal disease. It is a predecessor of Portal Hypertension and Chronic liver disease. Gray scale and Doppler ultrasound are reported to be useful imaging modalities in evaluation of Portal hypertension and chronic liver disease. Doppler ultrasound indices of "portal and splenic blood velocity & flow" and "resistive index at hepatic, splenic, renal and superior mesenteric arteries" are sensitive and commonly used indices in evaluation of portal hypertension^{20,21,23}.

Ultrasound is also shown to be a useful tool for screening patients with portal hypertension and cirrhosis for development of Hepatocellular carcinoma. The male to female ratio of Hepatocellular carcinoma in our study was 3:1 which was in good agreement with available data from Lahore(5.4:1)²³.

Obstructive jaundice was found in 2.5% of patients. Assessing details of level of obstruction was not among objectives of this study however ultrasound is reported to be a useful tool in evaluation of obstructive jaundice and assessing level of obstruction. Moreover in our study obstructive jaundice was more common in male than in females in contrast to data reported by Siddique et al. in data from Rawalpindi³⁷.

Among Pediatric population Cholelithiasis was found in 25% of cases which was in agreement with data reported by Malik et al. demonstrating an increase in incidence of Cholelithiasis among children. Cholelithiasis was also the most frequent finding in geriatric population³⁸.

CONCLUSIONS

Hepatobiliary diseases are among common medical problems of our region. Gray scale & Doppler Ultrasound is a safe, cost effective and sensitive tool for evaluation of Hepatobiliary system. Further research is needed from our region comparing use of ultrasound with other available imaging modalities.

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Correspondence Address:

Dr. Ejaz Hussain Siddiqui
Chief Consultant & Head,
Department of Radiology,
Government City Hospital, Peshawar, Pakistan
H1/159, Street: 10 Phase: 2,
Hayatabad, Peshawar 25100, Pakistan
drejazzsiddiqui@gmail.com

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