

To Determine Diagnostic Accuracy of Ultrasonography in Adults with Obstructive Jaundice: An Institutional Based Study

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ABSTRACT

Background: Obstructive jaundice is one of the common causes of jaundice. It is important cause of morbidity and mortality in an adult. The present study was conducted to determine the diagnostic accuracy of ultrasonography in adults with obstructive jaundice.

Materials and Methods: This was a cross-sectional study of 120 adult patients referred for abdominal ultrasound on account of clinical and biochemical features of obstructive jaundice. All the patients underwent sonographic examinations before the treatment/intervention was instituted. Transabdominal ultrasonogram was obtained in all cases. The cause of obstruction was mentioned during scanning. Sonographic findings and diagnoses were finally compared to operative findings and/or histopathological reports. The data were analysed using IBM SPSS Statistics software. Statistical significance was set at $p \leq 0.05$.

Results: In the present study total patients were 120. In females (64.16%) obstructive jaundice was more prevalent than males. In both males (37.20%) and females (31.16%) it was prevalent in patients with age above 60 years. On ultrasound, pancreatic carcinoma (31.6%), choledocholithiasis (24.1%), and gallbladder carcinoma (13.3%) were the most prevalent diagnoses. The overall accuracy of ultrasound with final diagnosis was 90.8%. In case of pancreatic carcinoma

accuracy was 94.7%, in case of Choledocholithiasis accuracy was 89.65%. Maximum accuracy was in case of Choledocholithiasis + Cirrhosis, Cholangiocarcinoma, Cholelithiasis, Cholecystitis, Gastric carcinoma, Hepatocellular carcinoma, Liver cirrhosis i.e 100%.

Conclusion: The present study concluded that diagnostic accuracy of ultrasonography in adults with obstructive jaundice was 90.8%.

Keywords: Cholangiocarcinoma, Cholelithiasis, Cholecystitis, Ultrasonography, Obstructive Jaundice.


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INTRODUCTION

Jaundice is a clinical condition in which the body fluids and tissues, particularly eyes, skin takes yellowish color as a result of excess bilirubin.¹ There are two types of jaundice i.e. non-obstructive and obstructive jaundice.² The most common causes of non-obstructive jaundice are alcoholic liver disease.³ Obstructive jaundice is a common surgical problem that occurs when there is an obstruction to the passage of conjugated bilirubin from liver cells to intestine.⁴ There was other investigations which helped in diagnosis of jaundice such as serum bilirubin, hepatic enzyme, complete blood account, liver biopsy and urine general. Also radiological investigations answering clinical questions and careful review of localizing solid mass, so that ultrasound cover as superior diagnostic tool in patient with obstructive jaundice.⁵

The diagnostic capacity of USG has increased in recent years. In addition USG is used not only for diagnostic tool but also to enhance safety and effectiveness of other diagnostic tools as well as therapeutic potentials.⁶ Ultrasound has easy accessibility, speed, ease of performance and low cost.⁷ The diagnostic accuracy of U/S in differentiating obstructive from non-obstructive jaundice is estimated to be high in the order of about 90%.^{4,8} The present study was conducted to determine the diagnostic accuracy of ultrasonography in adults with obstructive jaundice.

MATERIALS AND METHODS

This was a cross-sectional study of 120 adult patients referred for abdominal ultrasound on account of clinical and biochemical

features of obstructive jaundice. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute and written informed consent was taken from all participants after the study had been adequately explained to them.

All adult patients with clinical and biochemical (liver function test) features of obstructive jaundice were enrolled consecutively. Patients with jaundice (<20 years old) and adult patients with features of pre-surgical jaundice or in whom liver function test (LFT) did not show features of obstruction were excluded from the study. All the patients underwent sonographic examinations before the treatment/intervention was instituted. Transabdominal ultrasonogram was obtained in all cases with commercially

available real time scanner with color Doppler. Ultrasound machine with transducer frequency of 3.5 MHZ convex probe. Scanning was done in oblique, transverse and sagittal views. The patients were examined after an overnight fast of 8 hours, with the stomach distended with water to remove excess gas, and to create an acoustic window to view the pancreas adequately. With the patient in the supine position, a coupling gel was applied to the exposed abdomen in the right upper quadrant. The cause of obstruction was mentioned during scanning. Sonographic findings and diagnoses were finally compared to operative findings and/or histopathological reports. The data were analysed using IBM SPSS Statistics software. Statistical significance was set at $p \leq 0.05$.

Table 1: Distribution of patient cording to age and gender

Age(years)	Gender		Total
	Male N (%)	Female N (%)	
20-30	6(13.95%)	9(11.68%)	15(12.5%)
31-40	2(4.65%)	11(14.28%)	13(10.83%)
41-50	7(16.27%)	13(16.88%)	20(16.66%)
50-60	12(27.90%)	20(25.97%)	32(26.66%)
Above 60	16(37.20%)	24(31.16%)	40(33.33%)
Total	43(35.83%)	77(64.16%)	120(100%)

Table 2: Ultrasound diagnosis of obstructive jaundice

Ultrasound diagnosis	No. of patients (%)
Pancreatic carcinoma	38(31.6%)
Choledocholithiasis	29(24.1%)
Choledocholithiasis + Cirrhosis	2(1.6%)
Gallbladder carcinoma	16(13.33%)
Cholangiocarcinoma	6(5%)
Metastatic lesion	3(2.5%)
Periampullary carcinoma	11(9.1%)
Cholelithiasis	2(1.6%)
Cholecystitis	3(2.5%)
Lymphoproliferative disease	4(3.3%)
Gastric carcinoma	1(0.8%)
Hepatocellular carcinoma	2(1.6%)
Liver cirrhosis	3(2.5%)
Total	120(100%)

Table 3: Comparison of Ultrasound Diagnosis with Final Diagnosis

Ultrasound diagnosis	Accurate results
Pancreatic carcinoma	36(94.7%)
Choledocholithiasis	26(89.6%)
Choledocholithiasis + Cirrhosis	2(100%)
Gallbladder carcinoma	15(93.7%)
Cholangiocarcinoma	6(100%)
Metastatic lesion	2(66.6%)
Periampullary carcinoma	9(81.8%)
Cholelithiasis	2(100%)
Cholecystitis	3(100%)
Lymphoproliferative disease	2(66.6%)
Gastric carcinoma	1(100%)
Hepatocellular carcinoma	2(100%)
Liver cirrhosis	3(100%)
Total	109(90.8%)

RESULTS

In the present study total patients were 120. In females (64.16%) obstructive jaundice was more prevalent than males. In both males (37.20%) and females (31.16%) it was prevalent in patients with age above 60 years. On ultrasound, pancreatic carcinoma (31.6%), choledocholithiasis (24.1%), and gallbladder carcinoma (13.3%) were the most prevalent diagnoses. The overall accuracy of ultrasound with final diagnosis was 90.8%. In case of pancreatic carcinoma accuracy was 94.7%, in case of Choledocholithiasis accuracy was 89.65%. Maximum accuracy was in case of Choledocholithiasis + Cirrhosis, Cholangiocarcinoma, Cholelithiasis, Cholecystitis, Gastric carcinoma, Hepatocellular carcinoma, Liver cirrhosis i.e 100%.

DISCUSSION

Obstructive jaundice can be caused by the obstruction of the bile duct with gall stones, strictures, malignancy, etc. Obstructive jaundice is common amongst females and choledocholithiasis are the commonest benign cause.⁹

In the present study total patients were 120. In females (64.16%) obstructive jaundice was more prevalent than males. In both males (37.20%) and females (31.16%) it was prevalent in patients with age above 60 years. On ultrasound, pancreatic carcinoma (31.6%), choledocholithiasis (24.1%), and gallbladder carcinoma (13.3%) were the most prevalent diagnoses. The overall accuracy of ultrasound with final diagnosis was 90.8%. In case of pancreatic carcinoma accuracy was 94.7%, in case of Choledocholithiasis accuracy was 89.65%. Maximum accuracy was in case of Choledocholithiasis + Cirrhosis, Cholangiocarcinoma, Cholelithiasis, Cholecystitis, Gastric carcinoma, Hepatocellular carcinoma, Liver cirrhosis i.e 100%.

In the study by Kushwah et al¹⁰ and Upadhyaya et al¹¹ maximum number of patients (28%) were seen in age group of 51-60 years. Female preponderance was seen in the results of studies done by Ferrari et al¹² (53%), Upadhyaya et al¹¹ (53%), Kushwah et al¹⁰ (60%).

Generally, patients coming to hospital with obstructive jaundice are initially assessed by ultrasound. The sensitivity of ultrasound is limited and varies amongst operators. The sensitivity of abdominal ultrasound in choledocholithiasis varies between 20 to 80%.¹³ According to Singh et al, ultrasound has a sensitivity of 88% in diagnosing obstructive jaundice.¹⁴

Moreover, reported by Kani et al., that reported 97% sensitivity.¹⁵ Kumar et al. which concluded that ultrasonography as a single radiological investigation was sufficient in the evaluation of most patients with obstructive jaundice, with a sensitivity of 84% in detecting its cause.¹⁶

Ferrari et al. demonstrated that specificity of ultrasound in obstructive jaundice is 98.2%.¹²

In contrast, Dewbury et al. obtained a lower sensitivity of ultrasound for detecting the cause of obstructive jaundice, with a value of 58%.¹⁷

CONCLUSION

The present study concluded that diagnostic accuracy of ultrasonography in adults with obstructive jaundice was 90.8%. Ultrasonography helps in early institution of surgical intervention, thereby preventing morbidity and mortality.

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