Section: Radio-Diagnosis

Research

ASSESSMENT OF CASES OF ASCITES USING ULTRASONOGRAPHY

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Abstract

Background: To assess the cases of ascites using ultrasonography (USG). **Materials and Methods:** one hundred twenty cases of suspected ascites of either gender were included in the study. All were planned for ultrasonography (USG) to be taken with Toshiba with frequency of 3.5 MHz convex probe. The ascitic fluid and blood samples were assessed for ascitic albumin, cell count and differential, serum albumin, total protein and serum ascites albumin gradient (SAAG). **Result:** Out of 120 patients, males comprised 70 (58.3%) and females 50 (41.7%). The benign (68) comprised of inflammatory in 26, cardiac in 14, renal in 18, pyogenic peritonitis in 7 and tuberculosis peritonitis in 3 cases. Malignant had 40 in which gastric cancer was in 8, GB cancer in 12, ovarian cancer in 17, lymphoma in 3 and others in 12 cases. A significant difference was observed (P< 0.05). The mean value of total protein, total albumin and SAAG normal patients was 8.1 g, 3.5 g and SAAG 0.3 respectively. In mild cases was 8.5 g, 3.2 g and 0.2 g respectively. In moderate cases was 7.9 g, 2.9 g and 0.9 g. In severe cases was 6.7 g, 2.2 g and 1.4 g and in massive cases was 6.8 g, 2.1 g and 1.9 g respectively. The SAAG ratio was significant (P<0.05). **Conclusion:** In the assessment of ascites ultrasonography is a useful tool. Various causes found causing ascites were inflammatory, cardiac, renal, ovarian cancer.

INTRODUCTION

The occurrence of ascites is a common phenomenon. The development of ascites may be due to progression of diseases. Malignancy and infection are amongst various disease processes which may progress to ascites. Cirrhosis of liver is the leading cause approximately 2/3rd of all cases worldwide. Other favourable reasons can be entry hyper strain, heart disappointment, hepatic venous impediment, pericarditis, tuberculosis, pancreatitis, renal diseases and other diverse causes.

Physical examination is not sufficient to rule out case of ascites. The main reason may be due to insufficient free intra- peritoneal fluid. Radiographic signs such as -the hepatic angle and the flank stripe are very helpful for diagnosis. There should be 800-1000ml of free fluid for detection of ascites.[1]

Ascites arrangement in malignancies of the belly and pelvis for the most part has been credited to expanded rates of development intra peritoneal liquid and diminished rates of evacuation.[2] Appraisal of the volume of ascites is fundamental in observing the advance of the infection and in choosing fitting strategies for treatment. As of late the employments of ultrasound was observed to be expanded in assessing ascites and deciding its area. Transvaginal is very touchy in the recognition of free liquid in the pelvis.[3] Modernized Tomography assessment is considered of high affectability in recognizing as meager as 100 ml of ascitic liquid, Magnetic Resonance Imaging (MRI) may uncover illnesses causes. Stomach paracentesis is vital for deciding the reason for a patient's ascites. This examination occurred with a specific end goal to assess the etiology of ascites.[4] The present study was conducted to assess the cases of ascites using ultrasonography (USG).

MATERIALS AND METHODS

A sum total of one hundred twenty cases of suspected ascites of either gender were included in the study. Ethical review and research committee approved the study. All enrolled patients gave their written consent for participation.

After recording proper case history, a thorough clinical examination was carried out. All were planned for ultrasonography (USG) to be taken with Toshiba with frequency of 3.5 MHz convex probe. It has a 2.25 megacycle transducer. It detected echotexture, distribution and loculation of ascites. US guided paracentesis was done under sterile conditions. The ascitic fluid and blood samples were

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assessed for ascitic albumin, cell count and differential, serum albumin, total protein and serum ascites albumin gradient (SAAG). The total estimated abdominal ascites (TEAA) was classified as grade 1 (<200-600) ml (mild) and grade 2 (moderate) (>600-800) ml, grade 3 (severe/gross) (>800-1000) ml and grade 4 (massive) if TEAA recorded (>1000-2000) ml. Results were subjected to statistical analysis using Mann Whitney U test. P value < 0.05 was considered significant.

RESULTS

Out of 120 patients, males comprised 70 (58.3%) and females 50 (41.7%) [Table 1].

Table 1: Distribution of patients

Total- 120		
Gender	**Males**	**Females**
Number (%)	70 (58.3%)	50 (41.7%)

Table 2: Causes of ascites

Parameters	**Variables**	**Number**	**P value**
Benign (68)	Inflammatory	26	0.05
	Cardiac	14	
	Renal	18	
	Pyogenic peritonitis	7	
	Tuberculosis peritonitis	3	
Malignant (40)	Gastric cancer	8	0.17
	GB cancer	12	
	Ovarian cancer	17	
	Lymphoma	3	
	Others	12	

The benign (68) comprised of inflammatory in 26, cardiac in 14, renal in 18, pyogenic peritonitis in 7 and tuberculosis peritonitis in 3 cases. Malignant had 40 in which gastric cancer was in 8, GB cancer in 12, ovarian cancer in 17, lymphoma in 3 and others in 12 cases. A significant difference was observed (P< 0.05) [Table 2].

Table 3: Analysis of ascitic fluid

Fluid	**Total protein**	**Total albumin**	**SAAG**
Normal	8.1	3.5	0.3
Mild	8.5	3.2	0.2
Moderate	7.9	2.9	0.9
Severe	6.7	2.2	1.4
Massive	6.8	2.1	1.9
P value	0.12	0.17	0.01

The mean value of total protein, total albumin and SAAG normal patients was 8.1 g, 3.5 g and SAAG 0.3 respectively. In mild cases was 8.5 g, 3.2 g and 0.2 g respectively. In moderate cases was 7.9 g, 2.9 g and 0.9 g. In severe cases was 6.7 g, 2.2 g and 1.4 g and in massive cases was 6.8 g, 2.1 g and 1.9 g respectively. The SAAG ratio was significant (P<0.05) [Table 3].

DISCUSSION

Ascites is a gastroenterological term for an accumulation of fluid in the peritoneal cavity that exceeds 25 mL. Although most commonly due to cirrhosis, severe liver disease or metastatic cancer, its presence can be a sign of other significant medical problems, such as Budd–Chiari syndrome.[5] Diagnosis of the cause is usually with blood tests, an ultrasound scan of the abdomen, and direct removal of the fluid by needle or paracentesis. Ultrasound investigation is often performed prior to attempts to remove fluid from the abdomen. This may reveal the size and shape of the abdominal organs, and Doppler studies may show the direction of flow in the portal vein, as well as detecting Budd-Chiari syndrome (thrombosis of the hepatic vein) and portal vein thrombosis. Additionally, the sonographer can make an estimation of the amount of ascitic fluid, and difficult-to-drain ascites may be drained under ultrasound guidance.[6] The present study was conducted to assess the cases of ascites using ultrasonography (USG).

Our results showed that out of 120 patients, males comprised 70 (58.3%) and females 50 (41.7%). Getnet et al assessed the role of transabdominal ultrasonography in assessing the etiology of ascites in comparison with laboratory ascitic fluid analysis in 61 patients. Results showed that females were 35 with mean age of 43.2 years. USG suggested the diagnosis in 54 (91.5%) patients. Ultrasound characterized ascites correctly as exudate and transudate in 95% cases.[7-10]

Our results showed that the benign (68) comprised of inflammatory in 26, cardiac in 14, renal in 18, pyogenic peritonitis in 7 and tuberculosis peritonitis in 3 cases. Malignant had 40 in which gastric cancer

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was in 8, GB cancer in 12, ovarian cancer in 17, lymphoma in 3 and others in 12 cases. Tsujimoto et al in their study on 65 patients with benign and malignant causes of ascites, ultrasound showed normal GB wall thickness (≤3mm) on 37 patients and increased wall thickening (>3mm) with double wall appearance in 28 patients. Of the 37 patients with normal GB wall thickening, 35(95%) had peritoneal carcinomatosis. Of the 28 patients with thickened double-walled GBs, 23(82%) had benign disease. Benign causes listed in his study include cirrhosis, nephrotic syndrome and hypoalbuminemia.[11-13]

We observed that the mean value of total protein, total albumin and SAAG normal patients was 8.1 g, 3.5 g and SAAG 0.3 respectively. In mild cases was 8.5 g, 3.2 g and 0.2 g respectively. In moderate cases was 7.9 g, 2.9 g and 0.9 g. In severe cases was 6.7 g, 2.2 g and 1.4 g and in massive cases was 6.8 g, 2.1 g and 1.9 g respectively. Naile et al concluded that GB thickening had sensitivity and specificity of 80 and 88 in distinguishing benign and malignant causes of ascites, respectively. Smereczyncki et al determined difficulties in determining the nature of ascites using transabdominal ultrasonography. A total of 18 patients with non-neoplastic ascites and 62 patients with neoplastic ascites were evaluated. Statistically significant differences between benign and neoplastic ascites were found for: anechoic peritoneal fluid (<0.0001); fluid and thickened omentum with smooth surface (<0.0001); fluid and thickened omentum with smooth surface and varices (0.01); fluid and thickened omentum with hypoechoic foci (0.049); fluid and thickened omentum with tumor implants (0.009). The inclusion of the overall assessment of abdominal organs and the clinical data allowed for an improvement in ultrasonographic diagnostic accuracy in benign and neoplastic ascites from 83.3% and 67.7% to 94.4% and 93.5%, respectively.[14,15]

CONCLUSION

In the assessment of ascites ultrasonography is a useful tool. Various causes found causing ascites were inflammatory, cardiac, renal, ovarian cancer.

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